

Global Equity Strategy

Covid-19 – What's next?

Investment Strategy | Strategy

Growth in our central case: Credit Suisse economists have reduced their global GDP growth forecast for 2020 to 2.2%, and their forecast for European growth to 0.5% (from 2.7% and 1.2%, respectively, before the Covid-19 outbreak). We think global GDP could be 2%. The big unknown is whether this represents permanent loss of growth, or if a V-shaped recovery will offset the growth lost. To be a permanent loss, we think at least one of the following three events would need to occur: business models would have to change (unlikely); supply chains would need to be significantly disrupted-unlikely if China is 70-80% back to work by end-March (our Asia team estimates that the work resumption rate is c.75%, up from 39% in mid-February); or a major rise in bankruptcies (but the PBOC is de facto printing money and encouraging the banks to use this to offset working capital problems, with 30 million SMEs likely able to access funds via online banking). We assume Europe is not facing a pandemic, with the rate of increase in infections being lower than that seen in China in the early stages.

Chinese fiscal response and the fall in Chinese and US bond yields (leading to a rise of 15%+ in housing starts and two-thirds of mortgages can now be refinanced) should allow for a V-shaped recovery once new cases peak. Independent of the virus, some indicators of US growth (such as composite PMIs and job openings) have been at 'recessionary' levels, but other more reliable indicators are inconsistent with this (such as our own lead indicators or Fed Nowcasts).

Is the outbreak being controlled? Some reports suggest that daily infections ex Hubei province are down 99% from the peak, indicating that quarantines can work. Ex China, the rate of increase is not yet stabilising. We think we are now at the critical point with regards to infections and supply-chain impact.

Markets: In past epidemics, the buy signal has been between one week and one month after daily infections peaked. On average, previous health scares have seen the S&P down 2-5%, compared with 10% so far. Bounce-backs have tended to be very rapid (NJA underperformance was recouped within 52 days of the peak in SARS infections). Our tactical indicators had been at a three-year high and fast-moving ones are close to buy signal. We believe investors should seek a longer-term strategy, with the bounce-back in growth offsetting the near-term hit, a very high ERP (7% versus a warranted of 4.8%) and very loose and supportive monetary and liquidity conditions.

Regions: We take Continental Europe to underweight given limited policy response potential compared with other geographies, euro not being a safety value, open economies, high wage growth, poor earnings revisions and the threat and sector-adjusted P/Es are not compelling. We stick to the overweight of GEM (currency and some equity valuations vs. DM are back to 1997 Asian-crisis levels), especially China. We take the US back to benchmark tactically as it is the most defensive market.

Sectors: We like cyclical defensives (beverages, concessionaires) and some defensives look too cheap (tobacco, and German real estate). Euro cyclicals continue to price in a PMI of 45 (implying 0% GDP growth). We tactically raise pharma to benchmark.

What if a global pandemic: If the shutdown is similar to that in China, we estimate European GDP would fall c4% over one quarter, sending PMIs to 40 or lower, but Europe's weak policy response means a lot of this could be permanent. In the event of a global pandemic, when we stress test our models and assume a similar policy response as China, the S&P falls to c2,500.

Research Analysts

Andrew Garthwaite

44 20 7883 6477
andrew.garthwaite@credit-suisse.com

Robert Griffiths

44 20 7883 8885
robert.griffiths@credit-suisse.com

Nicolas Wylenzek

44 20 7883 6480
nicolas.wylenzek@credit-suisse.com

Mengyuan Yuan

44 20 7888 0368
mengyuan.yuan@credit-suisse.com

Asim Ali

44 20 7883 2480
asim.ali@credit-suisse.com

Timothy O'Sullivan

44 20 7888 9803
timothy.osullivan@credit-suisse.com

Table of contents

Central case	3
The impact of Covid-19: We believe growth is largely postponed, not lost	4
Central case: What to do with equities	7
Central case: What looks attractive?	13
Base case: What to avoid?	24
The risk scenario.....	26
Risk 1: Europe pursues a China-style economic shut down	27
Risk 2: A collapse in Chinese property prices	29
Risk 3: The US economy: soft forward-looking data, weak external outlook and	
USD strength	30
Market impact	32
Appendix	35

Covid-19 – What's next?

The past several days have seen a sharp sell-off in risk assets after a spate of new cases outside of China, including outbreaks in Italy and South Korea, dashed investor hopes that the epidemic was close to being contained.

In this report we discuss our central case and our risk case with regards to the Covid-19 outbreak.

Central case

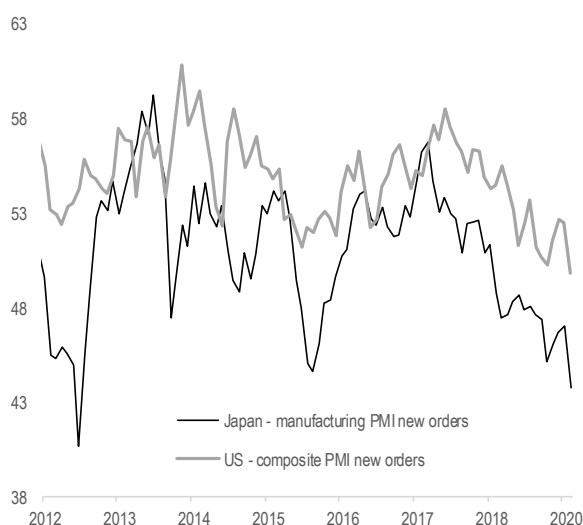
The SARS outbreak in 2003 took c.1% off China's full-year GDP. Given the strong response by the Chinese government (restricting travel, shutting down factories etc.), the economic impact of Covid-19 is likely to be at least double that of SARS and should take about 2% off full-year GDP, on our global strategy teams estimates. With China now accounting for 16% of global GDP, compared with just 4.4% at the time of the SARS crisis, the impact in China alone should take around 0.4% off global GDP and reduce global GDP growth to c.2.2% for 2020, on our estimates.

However, this is only the Chinese impact, and as the virus continues to spread (e.g. in Italy, South Korea and Japan), the global economic impact could be significantly bigger.

Europe is a particular concern, with GDP growth of only 0.9% yoy in Q4 prior to the outbreak. Europe has very little monetary flexibility compared with the US (so into a global pandemic the euro might actually rise) and the GSP and Black Zero mean that a fiscal response will be very late. Already, euro area GDP growth for 2020 has been taken down to 0.5% by our economists (tourism and travel is 3.9% of euro area GDP and if all the closely related sectors to these industries are included that rises to 10.3% of GDP see Appendix). As highlighted below, Japan has had a very dismal start to the year in terms of PMIs. Both suggest that global GDP growth is likely to be around 2%.

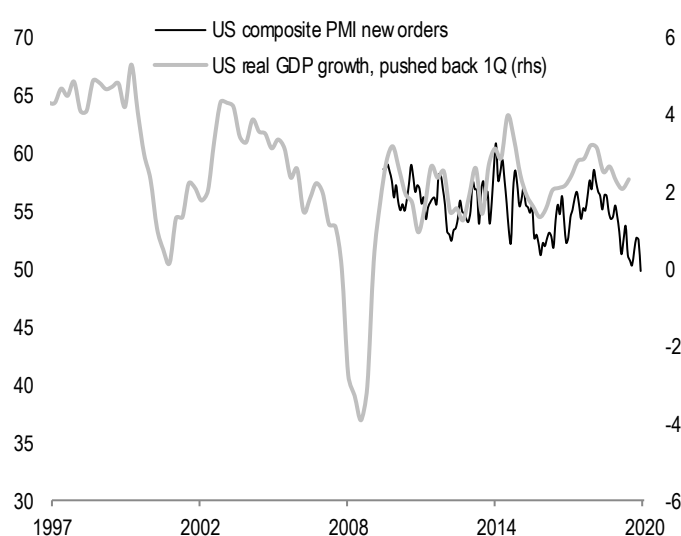
Independent of this, US composite PMI flash new orders have fallen to their lowest levels since the series started in 2009, while Japanese PMI new orders fell to seven-year lows – and this was before the recent increase in infections outside China.

Figure 1: Manufacturing new orders for Japan have dropped to a 7-year low



Source: Refinitiv, Credit Suisse research

Figure 2: US composite PMIs vs GDP growth



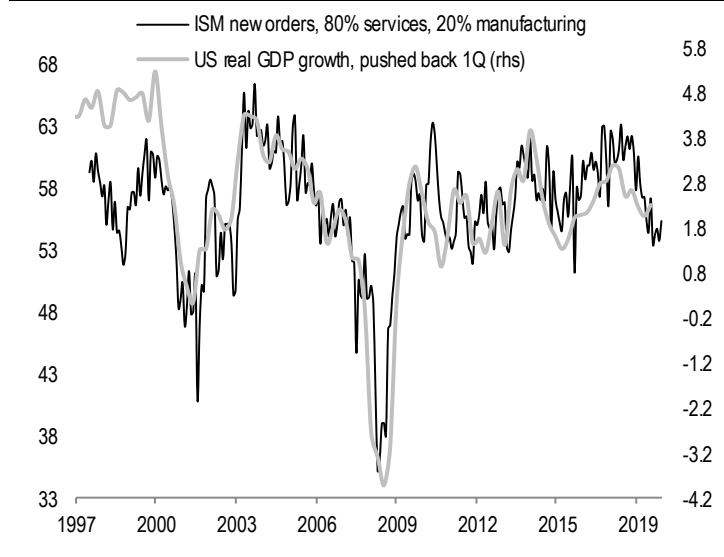
Source: Refinitiv, Credit Suisse research

At face value, this is concerning but we find that most other lead indicators do not seem to have reflected this weakness. Our preferred proxy of US GDP growth (a mix of ISM service new orders and ISM manufacturing new orders) was, admittedly, on the latest available data, still in line with 2% GDP growth, and our leading and lagging indicators of US growth have been at neutral levels (although rolling over).

We would also note the Atlanta Fed and New York Fed flash GDP estimates for Q1 are 2.6% and 2.01%, respectively.

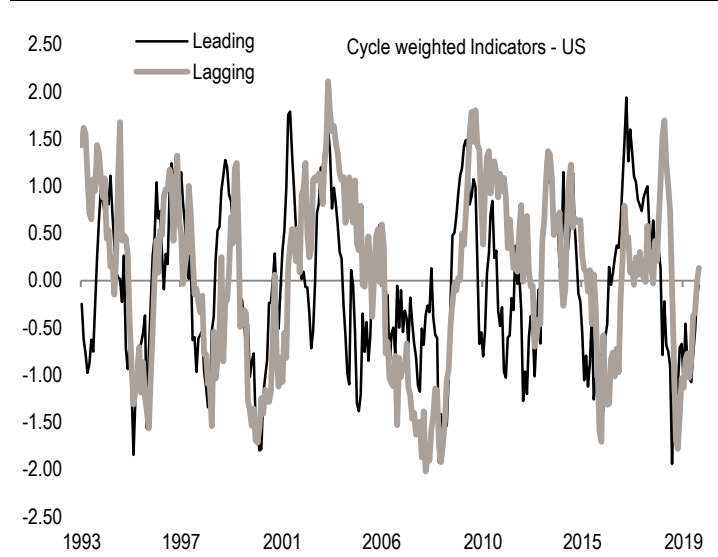
We believe that the preconditions for a prolonged recession include balance sheet deleveraging (bank or corporate), sharply rising wage growth (causing corporate margins to fall and central banks to tighten policy) or a commodity shock (which causes inflation – and in the 1970s led to a large rise in the global savings ratio). We cannot see any of these catalysts currently.

Figure 3: US Composite of ISM manufacturing and non-manufacturing implies c2% growth



Source: Refinitiv, Credit Suisse research

Figure 4: Leading and lagging indicators have picked up to normal levels



Source: Refinitiv, Credit Suisse research

The impact of Covid-19: We believe growth is largely postponed, not lost

According to Edmond Huang, Credit Suisse's China Strategist, average work resumption increased from 39% as at 14 February to around 75% as of 24th February, with the improvement seen across most provinces (see [China back to work - week 3](#), 25 Feb). Moreover, the central government has been putting out policies supporting companies returning to work, with President Xi specifically stating that the companies that are most important to the global supply chain and production should be given priority (SCMP, 21 Feb).

In our opinion, a majority of the Chinese consumption and investment is only postponed, not lost. Growth is only lost if there are major changes to business models, a major disruption to supply chains or a large rise in bankruptcies (which then affects investment and employment).

We discuss each of these in turn:

1. Change in business models

The impact from Covid-19 is temporary and should not lead to companies reconsidering their business models and supply chains. The trade war, rising wages in emerging markets and new technologies (e.g. 3D printing) are already driving some degree of on-shoring, but the virus is unlikely to accelerate this, in our opinion. (After all, if the impact is global, diversifying does not help.)

2. Supply chains

We are less concerned about disruptions to demand (because consumption can be postponed or pushed online) than disruptions to the supply chain potentially causing a more permanent hit to growth.

Speaking with our analysts, we find there is often not a lot of visibility on supply chains, but broadly speaking it seems that if production gets back to 70-80% of normal levels by the end of March, shortages should be avoided. As shown above, it seems 62% of production in China is back to normal levels and thus 80% should be achieved by end March.

- **Retailing:** Our retail analyst, Simon Irwin, highlights that the companies most affected are those that require delivery by air freight (e.g. Boohoo). Inditex, for example, has around 90 to 100 days of inventory (which is kept centrally in Spain and is flown out to the appropriate destinations). Most other retailers have about three months of inventory. In Simon's opinion, if production returns to 50% of normal levels in early March and 80% by end-March, widespread shortages are unlikely. Simon also highlighted that the Chinese government has been encouraging those companies that are important to the international supply chain to normalise production at the expense of those servicing the domestic market. In some areas, there is little alternative supply to China, particularly in areas such as toys or DIY.
- **Capital Goods:** Our analysts did not see any material impact. Philips has 52 days of inventories (at the group level) and is amongst the most exposed European capital goods companies in its supply chain, according to our team.
- **Autos:** There have been some high-profile disruptions in the press (JVC and JLR). Despite this, our Asia autos analyst, Bin Wang, believes that most auto and auto parts companies have resumed production and are likely to fully recover within two weeks. Thus the issue is one of demand, not supply.
- **Semis:** Using Foxconn as an example, the company has stated that it intends to get back to 50% of normal production (implying it is below that currently) and its customers' forecasts imply that normal production should resume in April. Our analysts highlight that semis companies had 4 to 7 weeks of inventories back in mid-February, implying that mid-to-late March would be crunch time.

3. Bankruptcies

A rise in bankruptcies across sectors could result in a severe and permanent hit to growth, via layoffs and reduced investment. S&P highlighted that a prolonged inflection could cause 11.5% of Chinese loans to become 'questionable' (i.e. non-performing or late) (FT, 24 Feb). The reported NPL ratio was less than 2% at the end of last year in China.

However, as we argue below, policy responses are likely to prevent a major rise in bankruptcies and banks have already provisioned 186% on their NPLs. De facto, the PBOC is printing money, which is going to state-owned banks and intended to alleviate working capital problems. The clear unknown is whether the 30 million SMEs in China can access working capital from banks. We suspect, given the sophistication of online financing, that SMEs should be able to access bank credit.

We have also seen a strong policy response

The Chinese government has clearly shown it is willing to do everything necessary to prevent a working capital or NPL crisis. Measures include:

- **PBOC stimulus:** According to the FT (20 February), the PBOC, in conjunction with other financial regulators, rolled out 30 policy measures to support enterprises heavily affected by the epidemic, in particular small and micro ones, private enterprises and the manufacturing sector. More specifically, the PBOC provided 300bn RMB in special loans to large banks and selected local banks in severely hit provinces, and cut the one-year loan prime rate from 4.15% to 4.05%, and the five-year rate from 4.80% to 4.75%. Moreover, Chen Yulu,

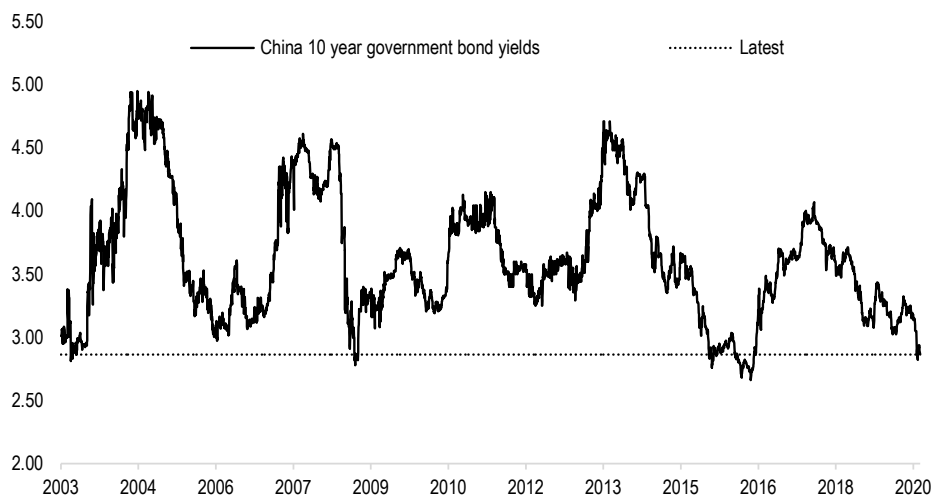
Deputy Governor of the PBOC, said on Monday that China will take a more dynamic approach with regards to the RRR, with market participants expecting a cut in the RRR by the end of the week.

- **Bank lending:** State banks have been instructed to provide more loans to SMEs, especially in areas impacted by the virus. In turn, the China Banking and Insurance Regulatory Commission stated that some new bad loans created during the crisis should not be counted as non-performing loans.

The regulator is also fast-tracking so-called 'virus bonds', which are approved within days rather than weeks as long as at least 10% of cash raised is used for investments to fight the virus. The state-owned banks have been encouraged to buy these (FT, February 19)

- **Room for fiscal easing:** China still has significant room for more fiscal easing. Even though the IMF's Article IV budget deficit estimate is 12.7% of GDP, government debt to GDP is only 80%. According to IMF analysis, with a primary budget deficit of 9% of GDP and assuming a GDP growth slowdown to 5.5%, government debt to GDP could rise to only 101% in 2024 in gross terms. In gross terms, this is only in line with the US, but in net terms it is much lower given the vast amount of government assets (e.g. SOEs).
- **Lots of room to ease monetary policy:** China still has net foreign assets of 16% of GDP and thus is able to print money (i.e. the weaker the RMB gets, the richer China becomes) and a low loan-to-deposit ratio (80%). China RRR is still high by international standards.
- **Fall in Chinese bond yields:** The recent fall in Chinese bond yields helps to prop up funding, asset markets and real estate.

Figure 5: China government bond yields



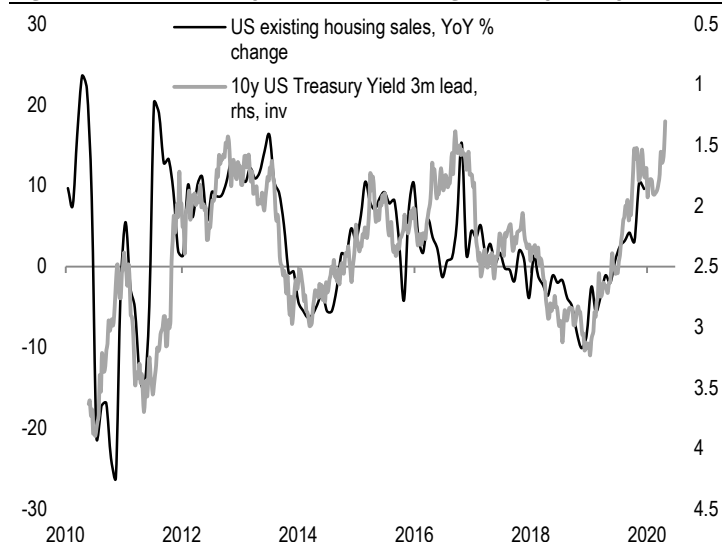
Source: Refinitiv, Credit Suisse research

Moreover, stimulus is not limited only to China.

- **Several Asian economies have started to ease fiscal policy.** For example, Hong Kong has announced an HK\$71bn cash handouts to residents. Singapore also rolled out US\$4.6bn worth of financial measures to counter the impact of the Coronavirus outbreak. South Korea announced plans to extend Won 420bn (USD\$356m) in emergency loans to support industries that have been heavily impacted.
- **Fall in US treasury yields:** The fall in US yields is helping the US housing sector, with housing as percentage of GDP still below average (3.8% of GDP compared to 6.7% of

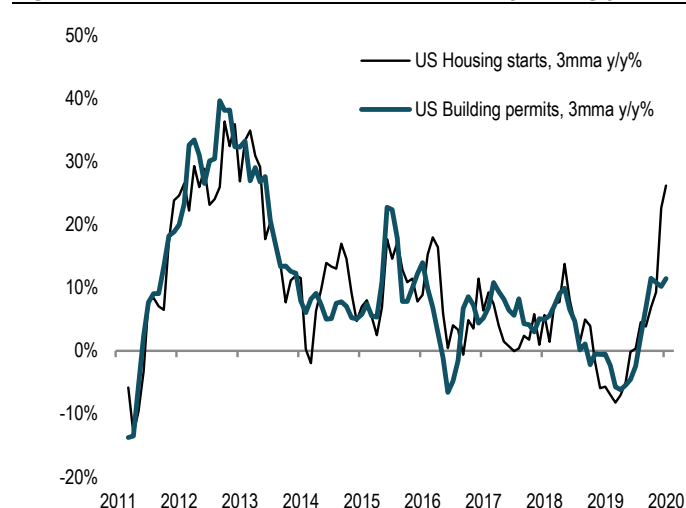
GDP at the peak of the last cycle). Permits are already up 12% y/y and stronger house prices help provide a wealth effect. Two-thirds of mortgages can now be refinanced.

Figure 6: When bond yields fall, housing sales typically improve



Source: Refinitiv, Credit Suisse research

Figure 7: Starts and permits are both up very strongly



Source: Refinitiv, Credit Suisse research

■ The Fed – likely to be very dovish

Critically, there is no constraint on the Fed easing should US growth start to disappoint. Core PCE is 1.6% (40bp below target) at a time when the Fed is willing to accept an inflation overshoot. The stock market and credit market in the US are very important transmission mechanisms (because 33% of non-housing related household wealth is in equities and around 70% of corporate funding is done via the corporate bond market). Hence, we think the Fed would respond quickly if necessary. We see the recent speech by one of the Fed governors, Lael Brainard, on “flexible inflation averaging”, as the latest sign of this, with her clear focus on the need to cap both short-term and long-term rates and to move quickly. Governor Brainard also said: “For monetary policy to be effective, it will be key for policymakers to communicate their strategy clearly in advance to the public, to act early and decisively, and to commit to providing the requisite accommodation until full employment and target inflation are sustainably achieved” (FT, 21 February).

In our opinion, the easing of monetary policy combined with fiscal easing should make up for the shortfall in growth that is lost in 1H 20 by the end of 2021. The lower discount rate attached to it (because of the fall in bond yields) should potentially help equities by putting a higher multiple on those earnings.

Risks to the base case

The main risk to our base case is a further spread of the virus across Europe and Asia that does significant damage to supply chains and leads to a permanent rise in bankruptcies. European growth prior to this was just 0.9% yoy and there is less space for a policy response. Already, our economists have taken down GDP growth to 0.5% (tourism and travel is 3.9% of EU GDP and if all the closely related sectors to these industries are included, that rises to 10.3% of GDP – see Appendix). Therefore we suspect the both the temporary and permanent impact on growth will be even bigger in Europe in case of a pandemic. For more details, see our risk case below.

Central case: What to do with equities

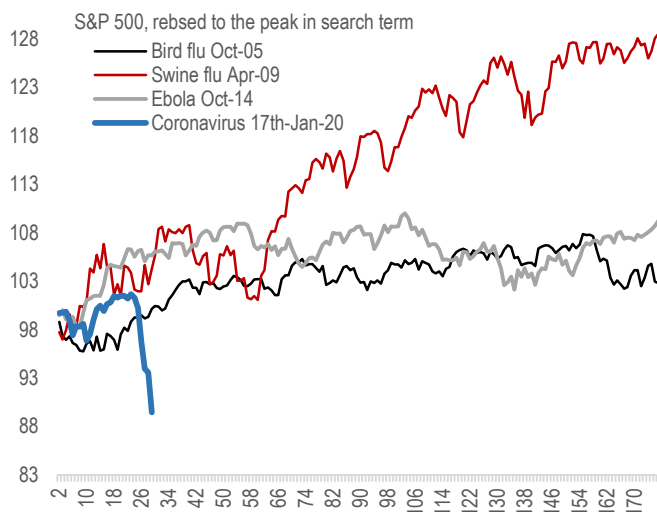
Too early to call the end of the consolidation phase

It is slightly too early to say that we are at the end of the consolidation phase that we called for previously (see [Equities: how much upside left?](#), 5 Feb).

Previous health-related scares have seen the S&P 500 fall by 2-5%. Since 20 January, when China officially confirmed human-to-human transmission, the S&P 500 is down by c10%, and the current outbreak is clearly worse than previous health scares.

Unfortunately into this sell-off, the context was one of equity inflows at a two-year high while other events such as the weakness of US composite PMIs (see above) and Senator Bernie Sanders emerging as the front-runner in the Democratic presidential primaries (and in some polls ahead of Trump) were already starting to erode confidence.

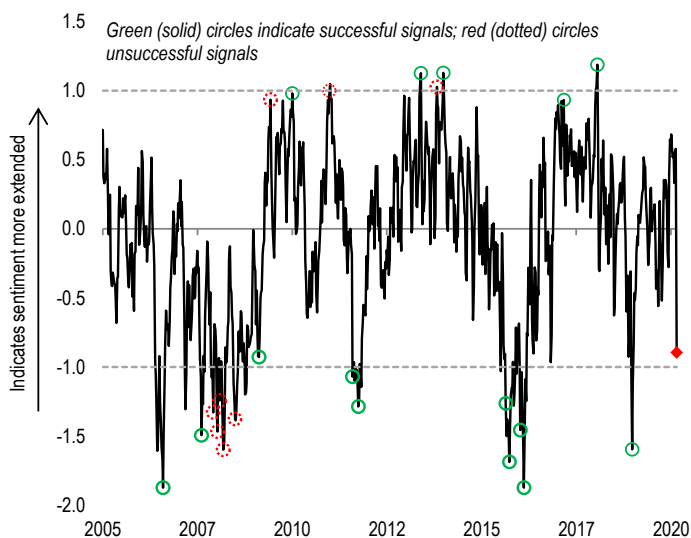
Figure 8: The S&P 500 declined by 2-5% on average during previous health scares



Source: Refinitiv, Credit Suisse research

Moreover, our tactical indicators have been falling sharply but are not yet in clear panic territory.

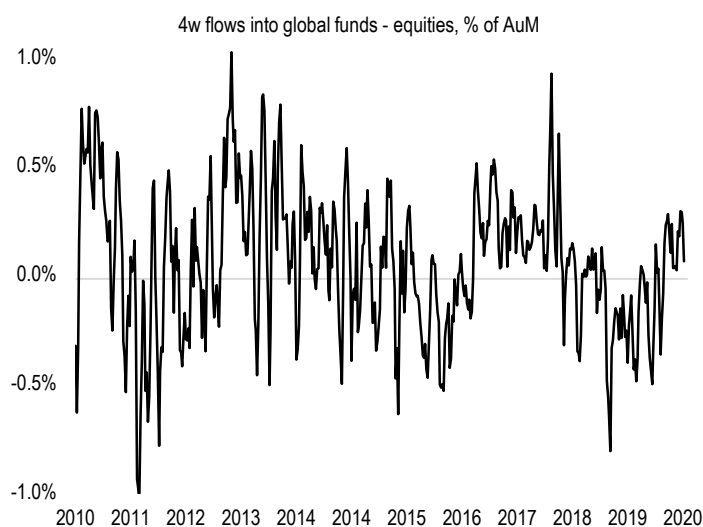
Figure 10: Aggregate tactical indicators



Source: Refinitiv, Credit Suisse research

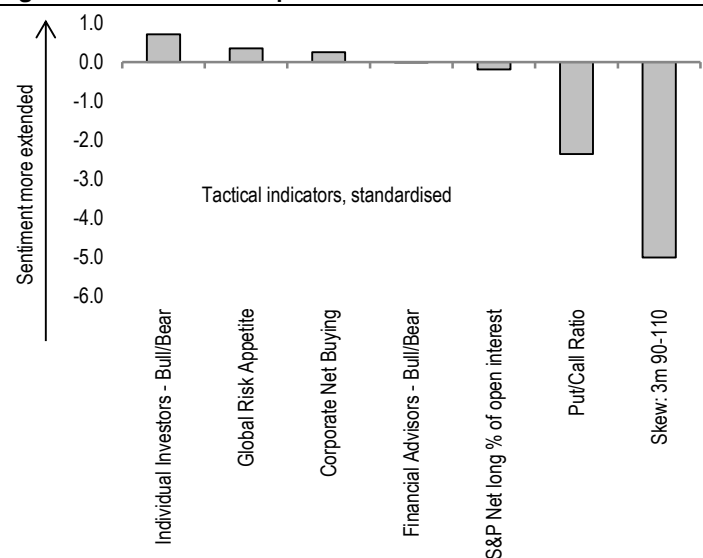
We are at a buy signal on skew and put call, but the other indicators are not quite at these levels, partly because survey data is weekly (see Appendix).

Figure 9: Inflows into global funds have picked up

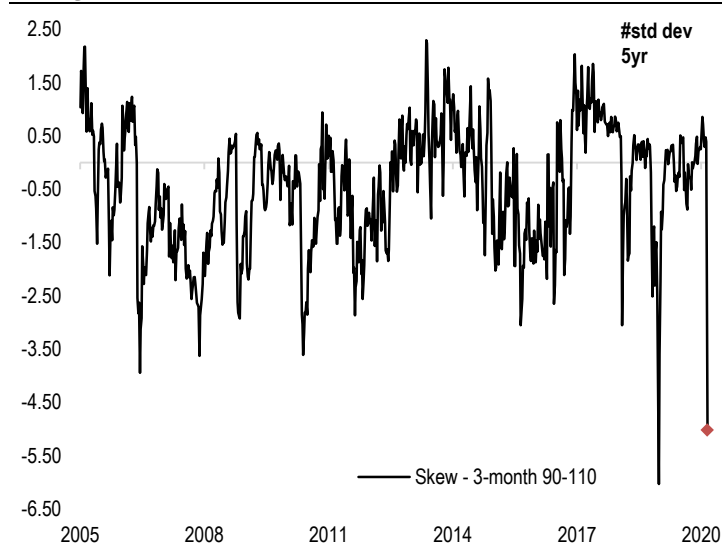


Source: Refinitiv, Credit Suisse research

Figure 11: Tacticals components

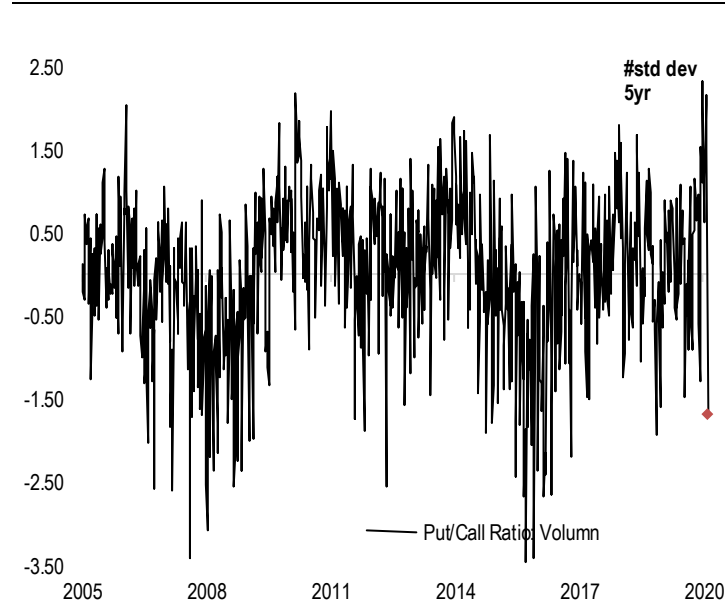


Source: Refinitiv, Credit Suisse research

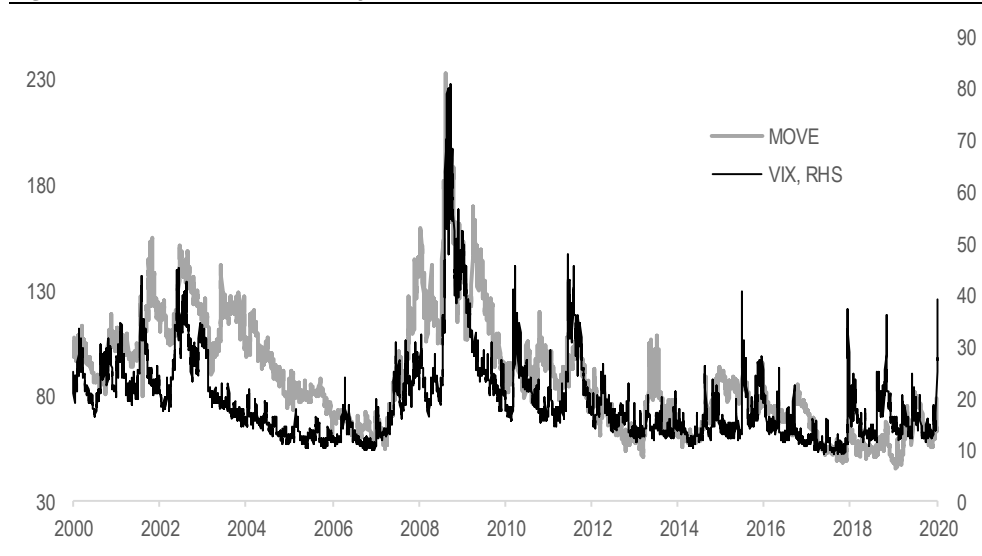
Figure 12: 3-month skew, standard deviation from 5-year average

Source: Refinitiv, Credit Suisse research

The VIX is also now at extreme levels.

Figure 13: Put/call ratio

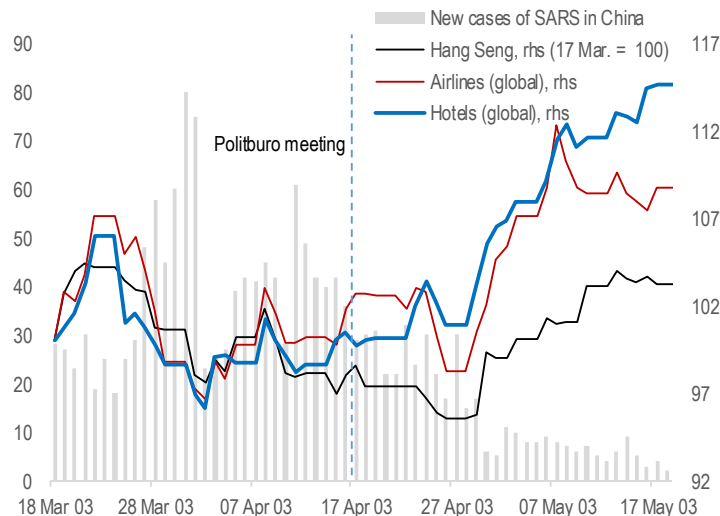
Source: Refinitiv, Credit Suisse research

Figure 14: VIX has risen sharply

Source: Refinitiv, Credit Suisse research

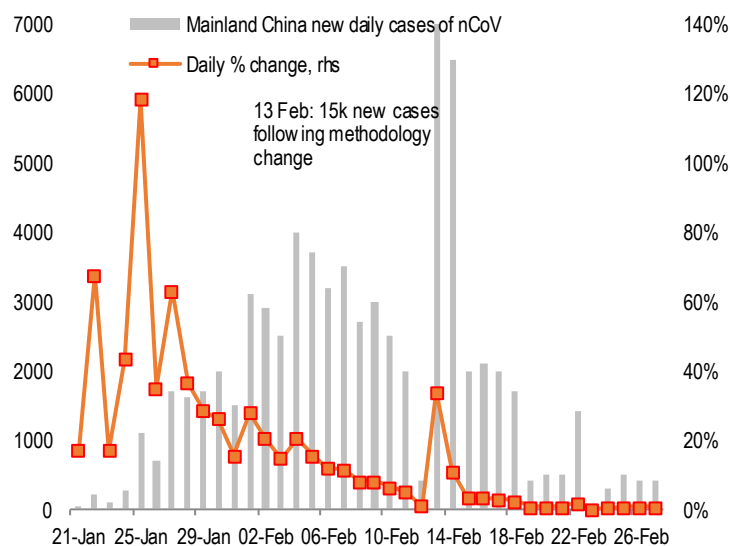
Catalyst for a bounce: we need to wait until a month after the peak infection rate

During the SARS outbreak, the market troughed around a month after the peak in the infection rate (although because investors were skeptical of the reporting, it was about a week after the second spike).

Figure 15: The Hang Seng stabilised about a month after SARS infections peaked...

Source: Refinitiv, Credit Suisse research

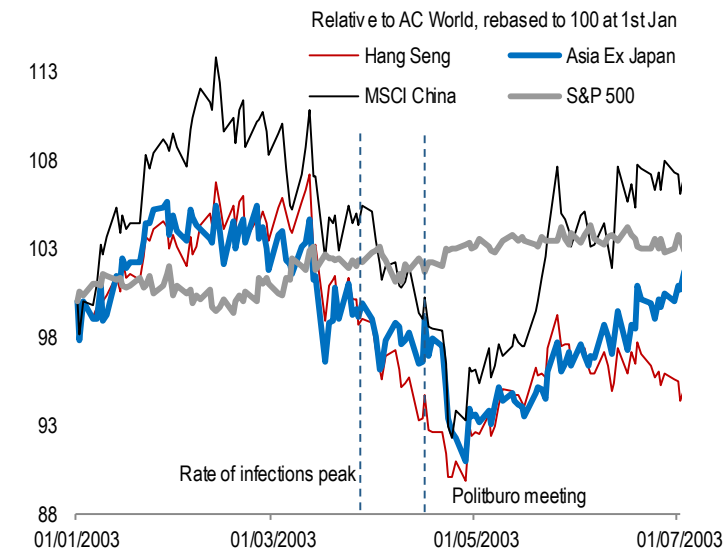
At the time of writing, it seems that the infection rate has peaked in China but not in the rest of the world (and Italy now accounts for over 10% of the global ex-China cases). Outside of Hubei province, daily new confirmed cases are down by 99% from the peak in China. The good news is that the daily infection rate increase outside of China is not accelerating dramatically (it is around 20%) and is much lower than was the case initially in China (where the increase in the first few days was 80%+).

Figure 17: The infection rate appears to have clearly peaked in China...

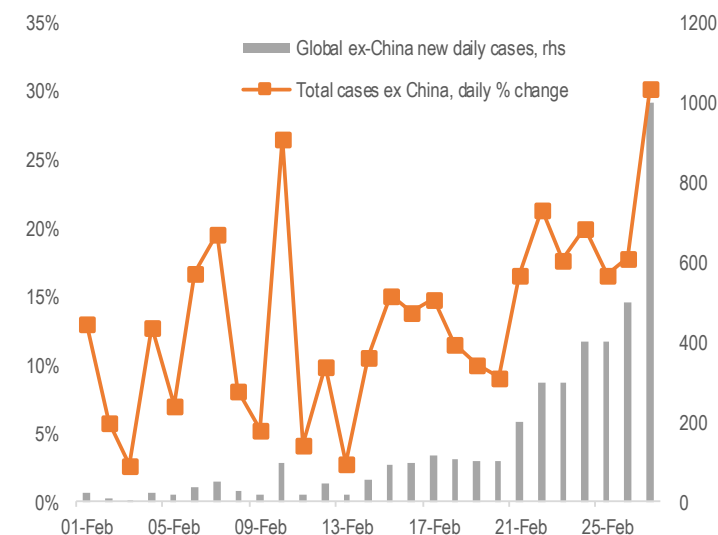
Source: Refinitiv, Credit Suisse research

Therefore, the next few days will be critical for answering the following questions:

- Is China getting back to work quickly enough to avoid major SME bankruptcies or supply chain disruptions? We think so.

Figure 16: ...with the Hang Seng, and Asia more broadly, underperforming by 11-12% peak-to-trough over the period

Source: Refinitiv, Credit Suisse research

Figure 18: ...although not globally ex-China

Source: Refinitiv, Credit Suisse research

- When people get back to work, is the infection rate starting to rise significantly again (so far there is no sign of this despite some people starting to return to work)? There should have been a small spike if that were so.
- Is the virus spreading across Europe? With an incubation period of up to two weeks (but on average around five days), we should soon be able to see the full scale of the outbreak in Italy. We remain cautiously optimistic on this.

We stay overweight equities structurally

History shows that crises tend to be followed by V-shaped recoveries.

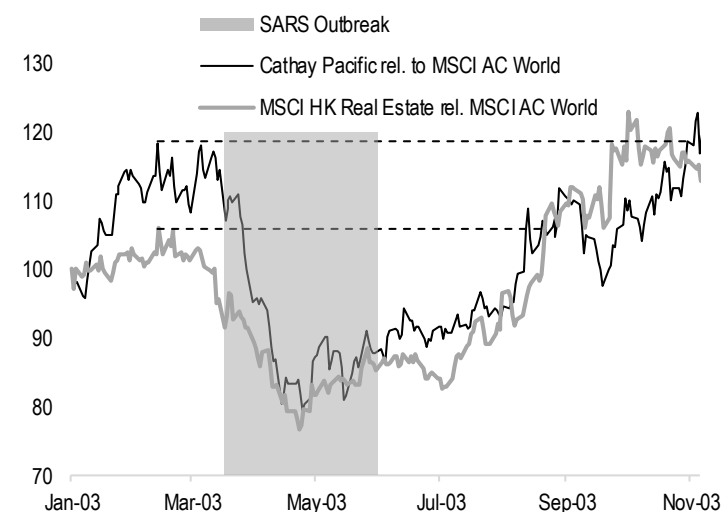
Figure 19: SARS saw Hong Kong equities underperform by nearly 11%; over a peak to trough decline in the Hang Seng, the S&P declined by only 2%

	Hang Seng	Asia Ex Japan	Nikkei	MSCI China	S&P 500	MSCI AC World
15/1-24/4 2003	-14.8%	-13.6%	-8.6%	-14.2%	-2.1%	-4.1%
17/1 to date	-3.8%	-2.6%	-0.3%	-4.8%	-1.0%	-0.9%
Time to get back to pre-SARS relative	95 days	52 days	62 days	22 days	N/A	N/A

Source: Refinitiv, Credit Suisse research

Examples include the most affected sectors during the SARS crisis (HK real estate or Cathay), where all the underperformance was recouped in 4-6 months. While many dismiss SARS as a relevant comparator, we think it is important to remember that at the time some thought that around a quarter of Hong Kong residents would be affected, when in fact it was just 0.0003% (FT 26 Feb) and the mortality rate was 11%. We can also see a V-shaped recovery if we look at the experience of Japan post the Fukushima earthquake and its aftermath (where the market underperformed by 13% and then rebounded as IP recovered to pre-crisis levels within six months).

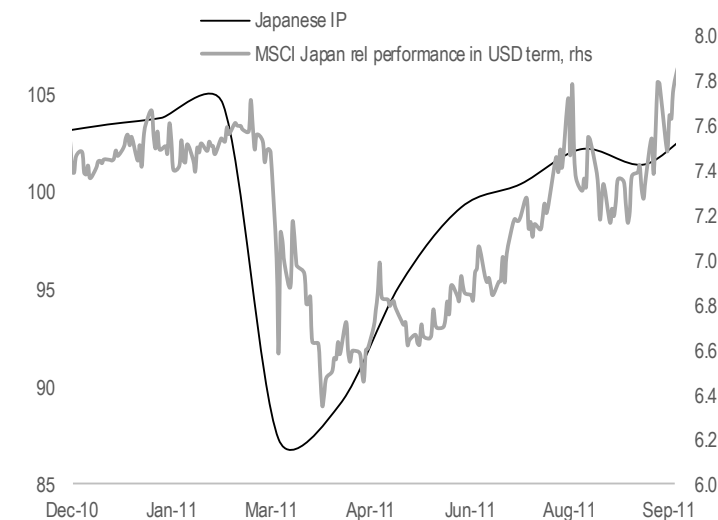
Figure 20: The most affected sectors/stocks rebounded quickly to make up for SARS-related underperformance



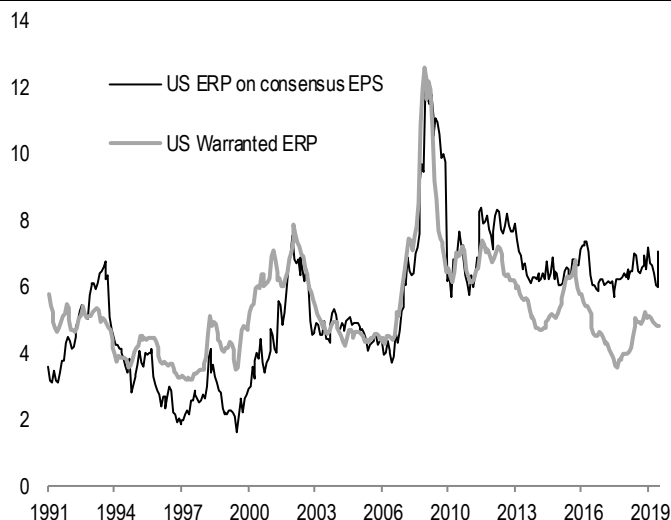
Source: Refinitiv, Credit Suisse research

Moreover, we still find the ERP abnormally high; we can see in the model below what is being discounted. The actual ERP is 6.85%, the warranted (which is based on ISM and credit spreads) is 4.6%. To get the warranted back to fair value, we would need to see a 10% fall in EPS and a 60bp rise in spreads.

Figure 21: Japanese equities recovered quickly from the earthquake

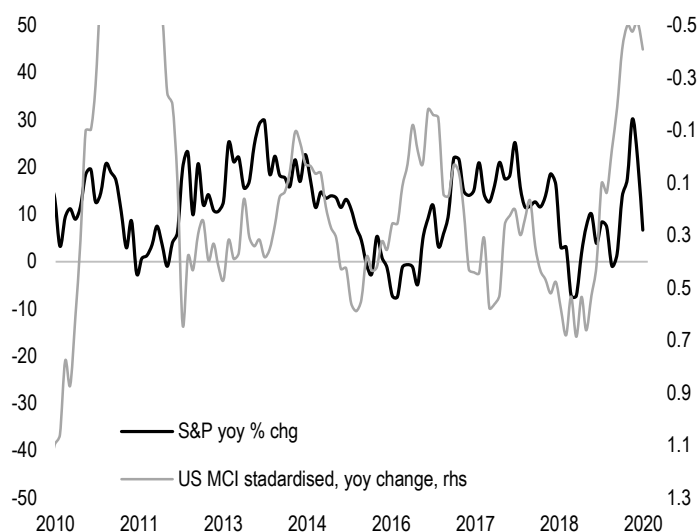


Source: Refinitiv, Credit Suisse research

Figure 22: The ERP is abnormally high versus the warranted

Source: Refinitiv, Credit Suisse research

Financial conditions on all measures look supportive. We can look at monetary conditions against the S&P or the change in central bank balance sheets.

Figure 24: Monetary conditions are consistent with a stronger S&P

Source: Refinitiv, Credit Suisse research

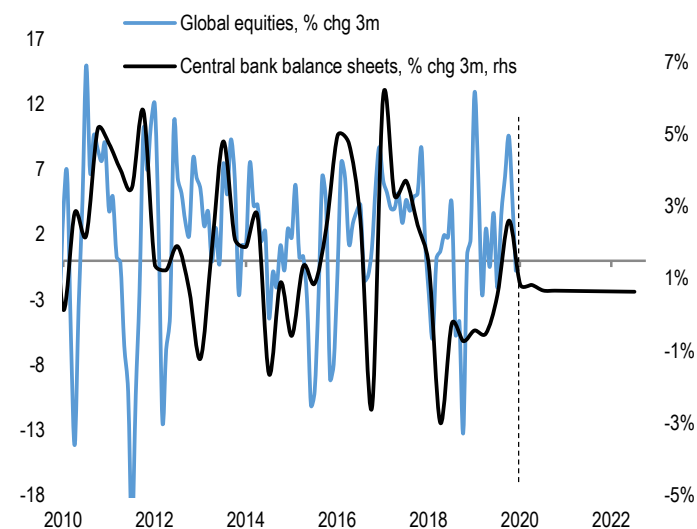
The important news economically is that wage growth has been slowing, looking at the wage component of the ECI. This suggests that full employment is closer to 2.5% to 3% than 3.5% and thus there is spare capacity in the labour market (with the participation rate c1.7% below previous peaks). This is also why our margin proxy stopped deteriorating (with the EBITDA margin ex-tech having been close to a seven-year low).

Figure 23: What's being priced in

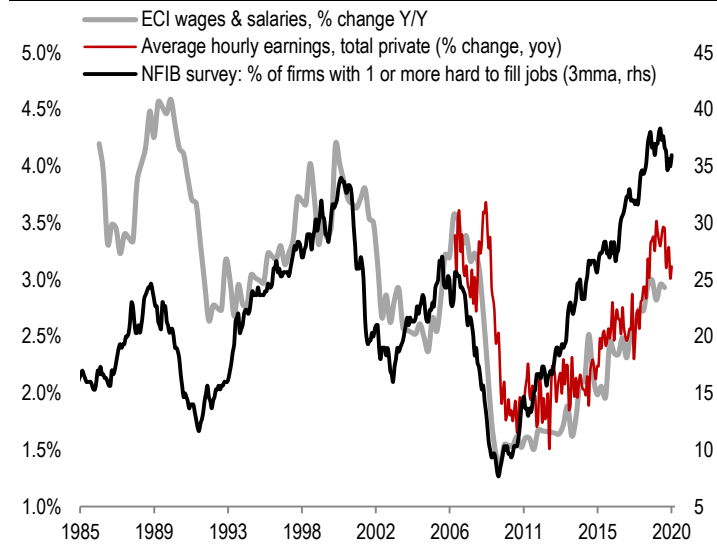
ERP				
% fall in EPS*		Warranted (fall in ISM and widening credit spreads)		Gap
Current	7.06	Current	4.83	2.23
-4%	6.37	50 (+20bps)	5.00	1.37
-8%	6.07	47 (+40bps)	5.40	0.67
-12%	5.77	44 (+60bps)	5.80	-0.03
-16%	5.48	40 (+80bps)	6.24	-0.76

*adjusting for (terminal) growth

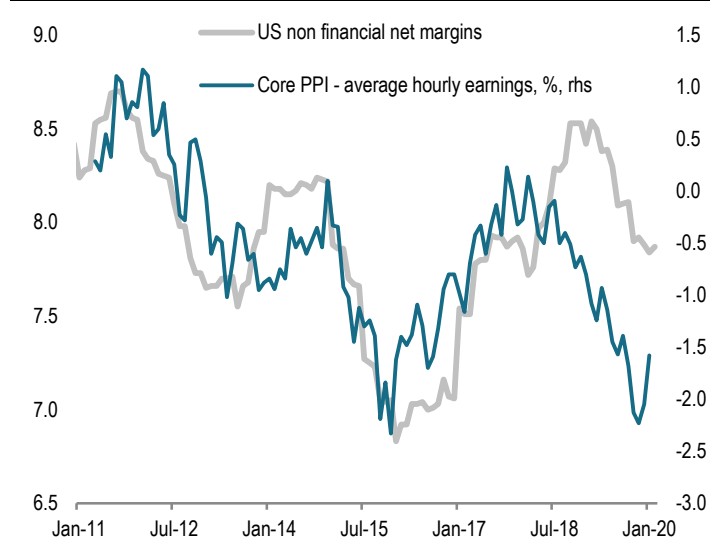
Source: Refinitiv, Credit Suisse research

Figure 25: MSCI AC World moved with the Fed balance sheet

Source: Refinitiv, Credit Suisse research

Figure 26: Wage growth is slowing

Source: Refinitiv, Credit Suisse research

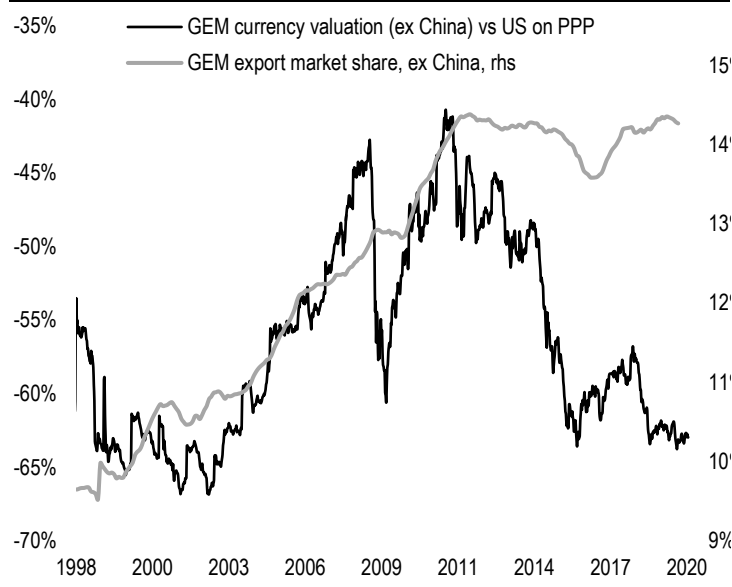
Figure 27: Our margin proxy has stopped deteriorating

Source: Refinitiv, Credit Suisse research

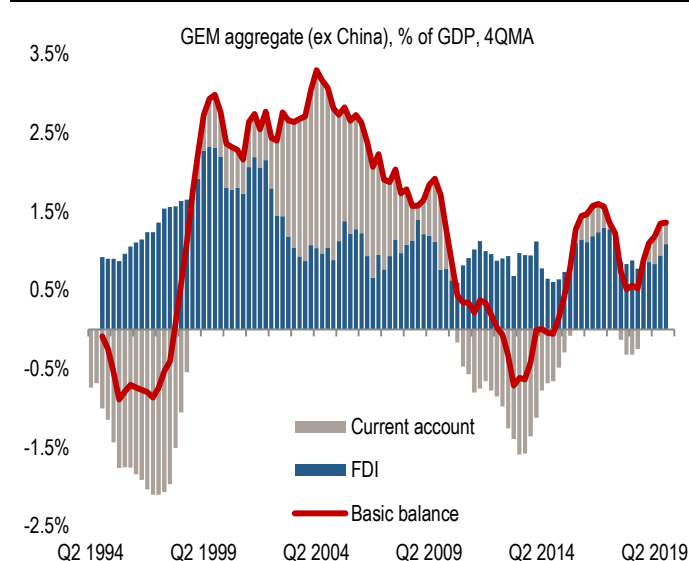
Central case: What looks attractive?

Emerging markets – overweight

Emerging market currencies ex the RMB against the dollar are at 1997 Asian financial crisis levels, yet export market shares and the basic balance of payments are both much better.

Figure 28: GEM currencies are, in aggregate (GDP-weighted), around 20pp cheap when compared to their global export market share...

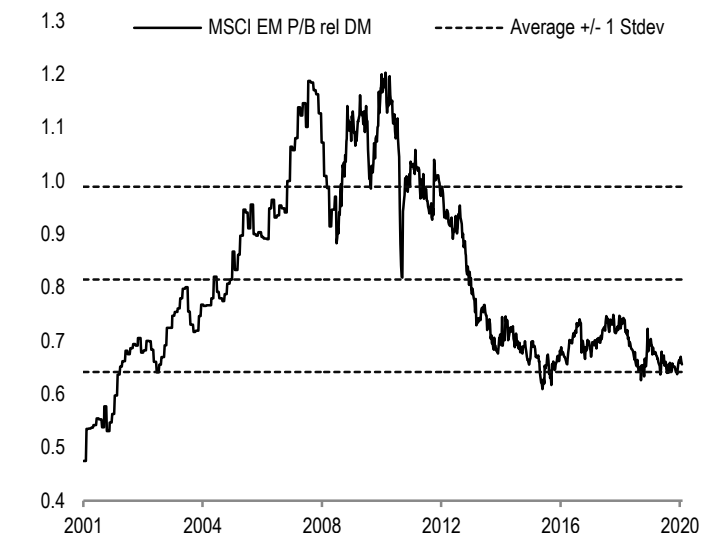
Source: Refinitiv, Credit Suisse research

Figure 29: ...yet the basic balance of payments remains healthy

Source: Refinitiv, Credit Suisse research

The P/B of GEM relative to DM is also back to Asian crisis levels and GEM are discounting a sharp rollover in China PMIs.

Figure 30: The P/B of emerging markets is trading at a discount of c35% relative to DM

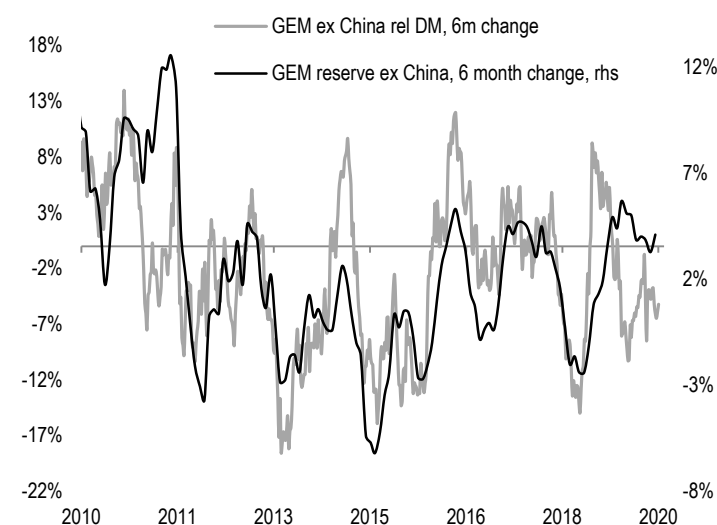


Source: Refinitiv, Credit Suisse research

The problem has been dollar strength. But we would highlight that although initially the US was viewed as a relative 'safe haven' (because the US was both a relatively closed economy and had few cases), in the past week this has ceased to be the case as investors realize that into the temporary global slowdown caused by the virus, the Fed has a lot more monetary flexibility than the ECB or the BoJ and thus US rates are likely to fall much more than those in Europe or Japan.

We would also highlight that FX reserves in GEM are increasing, and that is normally a good sign.

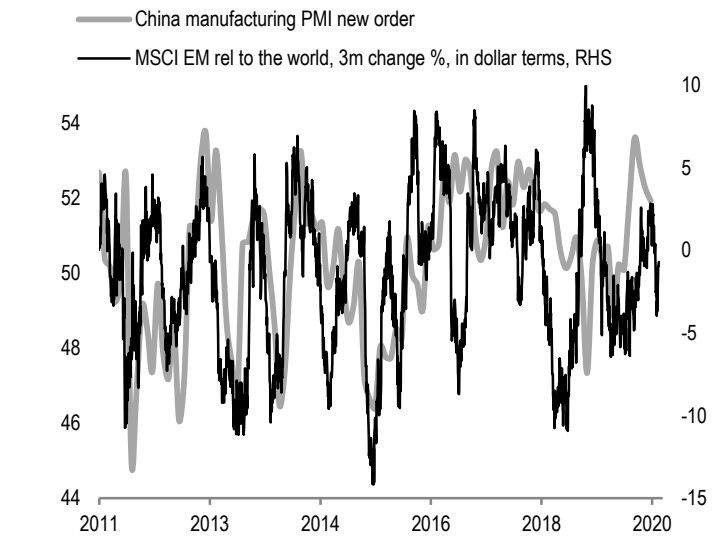
Figure 32: Change in FX reserves versus GEM performance



Source: Refinitiv, Credit Suisse research

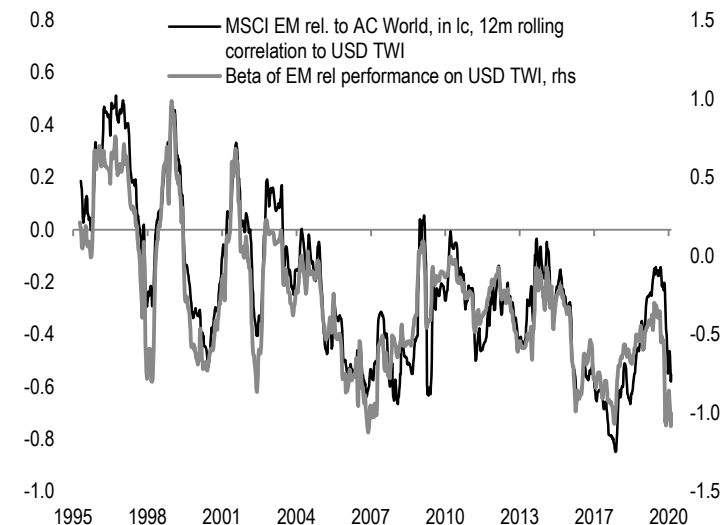
As shown already, China appears to be on top of the virus situation and has a proven policy response to deal with it (and to limit the negative longer-term consequences on bankruptcies in particular). We think that the 40% savings ratio is likely to be channeled in equities, not real estate (where turnover implies flat prices) or bond yields (with real yields being negative).

Figure 31: GEM relative performance in dollar terms correlates to China PMIs



Source: Refinitiv, Marikit, Credit Suisse research

Figure 33: Rolling correlation and beta of EM equities and USD



Source: Refinitiv, Credit Suisse research

We think Chinese equities look particularly attractive. They are trading on a P/B relative close to the bottom of their 10-year range.

Figure 34: Shanghai A is trading at the bottom of its 10-year range on PB relative



Source: Refinitiv, Credit Suisse research

In addition, the dividend yield versus the corporate bond yield is at levels that historically have been a buy signal.

Figure 35: Domestic equities look cheap against corporate bonds



Source: Refinitiv, Credit Suisse research

We therefore like stocks with China exposure.

Japan is discounting global GDP of 2% and is the most cyclical region.

As we highlighted a few days ago (see [COVID-19: What's priced in?](#)), we see Japan as both cheap and a play on PMIs. Japan is discounting global PMIs to be at just 48 (2% global GDP growth, which the IMF would call a global recession). Japan is also seeing very clear signs of corporate change (with buybacks running at c5% of market cap - double US levels) and a strong funds flow (with the BoJ additionally able to buy c2% of market cap). 20% of Japanese exports go to China versus 19% to the US and 11% to the EU. Thus, to some extent, if China

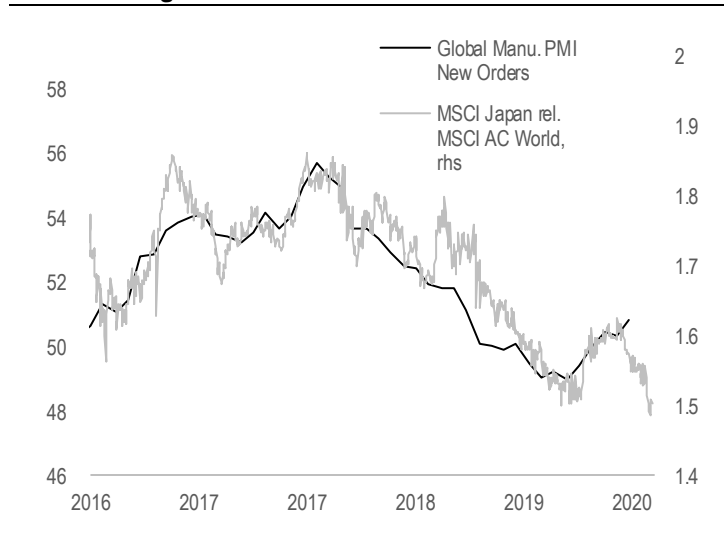
Figure 36: Historically, Shanghai A has tended to do well after the gap has hit current levels

Rel Performance (ac world, in lc terms) after	3m	6m
Dec-08	41.5%	51.6%
Jul-10	0.6%	-0.9%
Aug-12	-1.4%	3.9%
Jul-13	2.9%	-6.5%
Jun-14	9.3%	30.7%
Jun-16	1.6%	1.6%
Average	9.1%	13.4%
% of times positive	83.3%	66.7%

Source: Refinitiv, Credit Suisse research

has already taken most of the hit from the virus, Japanese GDP could prove more resilient than US or European GDP. If investors believe in our risk case, they should overweight Japan.

Figure 37: Japan's relative performance versus global manufacturing PMI new orders



Source: Refinitiv, Credit Suisse research

Figure 38: Japan trades at a significant P/E discount to MSCI World



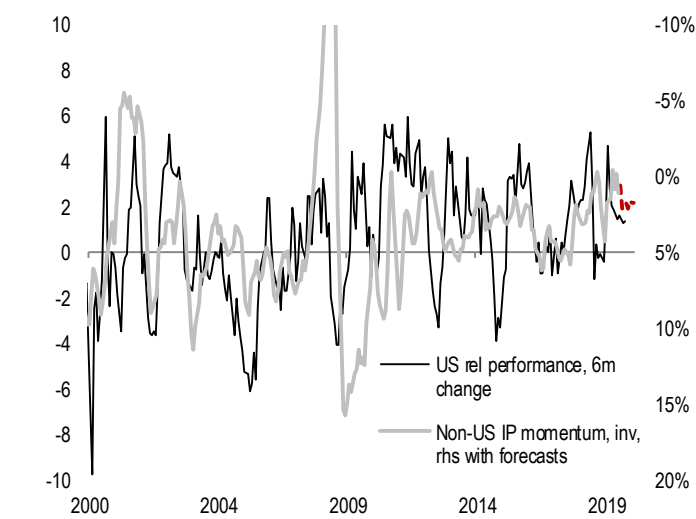
Source: Refinitiv, Credit Suisse research

The US

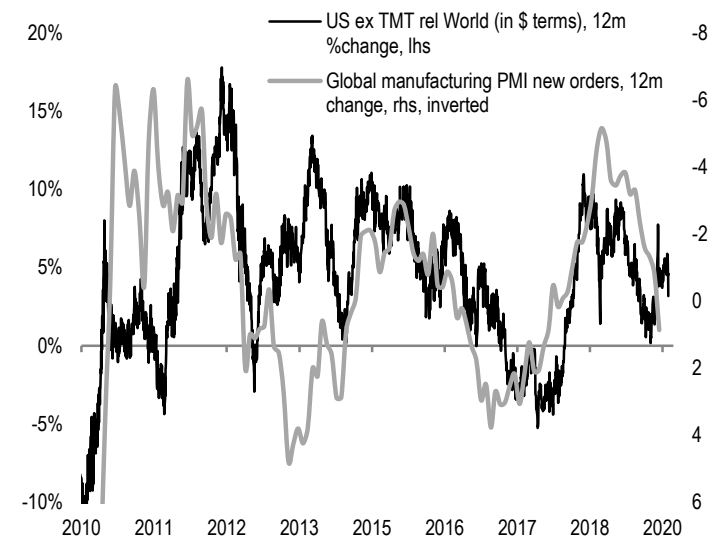
In this environment, we would normally stress tactically the defensive attributes of the US. This is because:

- The US has the lowest operational leverage of any major region.
- US corporates find it easier to cut costs than those elsewhere.
- The Fed has a dual mandate (to target both full employment and inflation) and, as discussed above, has become extremely dovish. The Fed clearly has a lot of flexibility with a balance sheet (as a percentage of GDP) that is one-fifth the size of the ECB.
- The US is a relatively closed economy (exports are 13% of GDP) with a low manufacturing weighting (manufacturing is 11% of GDP).
- We remain overweight of tech and two-thirds of the time tech outperforms, the US outperforms.

The net result is that the US has a very clear inverse correlation with non-US IP and the US ex tech has a very clear negative correlation with PMIs. In this environment, therefore, we would normally be overweight US equities.

Figure 39: The US outperforms when IP falls...

Source: Refinitiv, Credit Suisse research

Figure 40: ... and PMIs fall

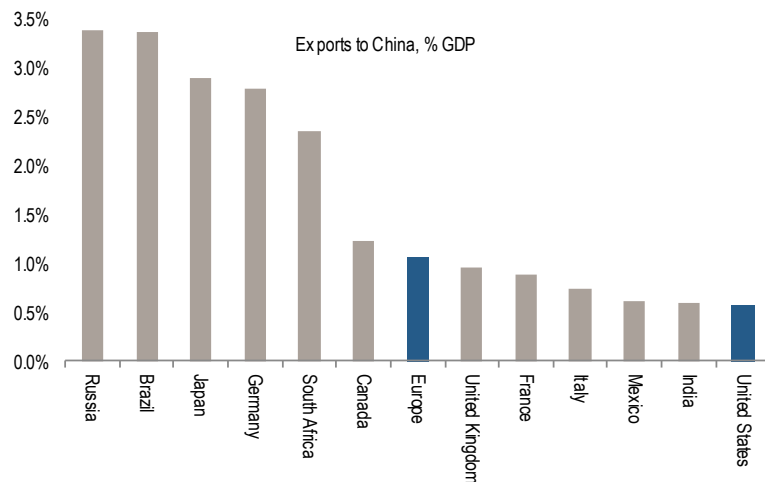
Source: Refinitiv, Markit, Credit Suisse research

The problem is two-fold: First, the rise of Sanders, who is leading in the democratic primaries and is running ahead of Trump in many recent polls (e.g. YouGov, Washington Post, Emerson) and second, that weakness in services sector PMIs. We add to our weighting to take the US to benchmark.

Continental Europe

We tactically reduce Cont. Europe to underweight for the following reasons:

- Europe is a very open economy and thus particularly vulnerable to a global growth shock. Its exports of goods and services outside the euro area are c.20% of GDP compared with US total exports being 12% of GDP (and just c.8% of GDP for goods), with European exports to China as a percentage of GDP being 0.5p.p. higher than those of the US.

Figure 41: Exports to China as % of GDP

Source: Refinitiv, Credit Suisse research

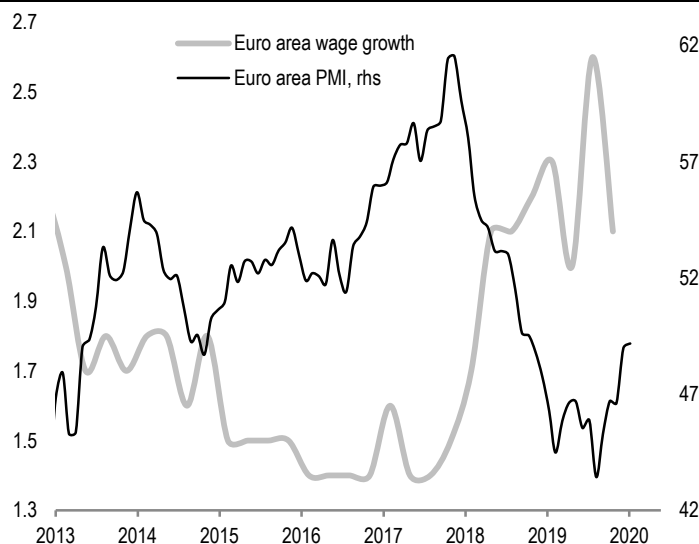
- The economic policy response to the virus in Europe is much more challenging than that elsewhere. The problem we see, as highlighted in our risk section, is that Europe's run rate of growth is already low (0.9% QoQ in Q4), it has little monetary flexibility (with a NIRP of -50bp) and fiscal policy will take a long time to co-ordinate given the Black Zero and the Growth and Stability Pact. Europe also has a high share of GDP coming from SMEs (57% of GDP) where a rise in bankruptcies could cause a temporary hit to be more permanent. China, Japan, the US and the UK are all able to have a much better monetary and fiscal and liquidity response to a growth shock.
- Relative earnings revisions in Europe are falling.
- Wage growth has been rising relative to PMIs. This threatens something of a margin squeeze at a time when Europe gross margins ex tech are above those of the US, as we show in the appendix.

Figure 42: European earnings momentum is now superior to that of the rest of the world



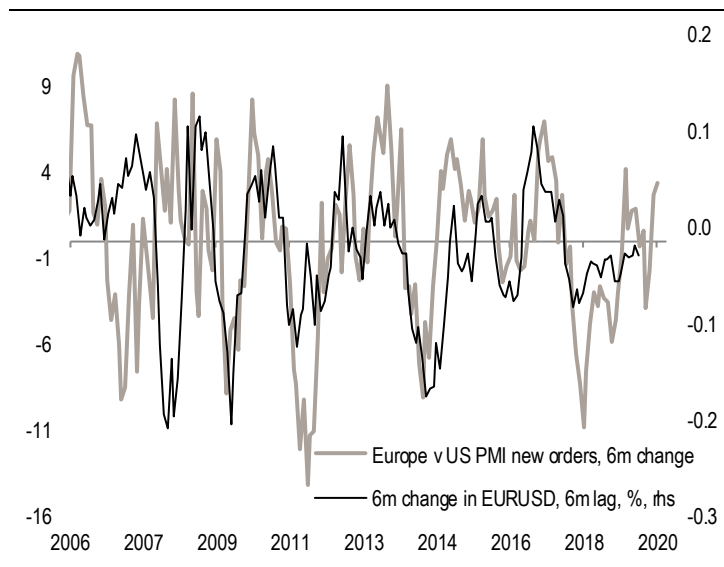
Source: Refinitiv, Credit Suisse research

Figure 43: European wages were picking up despite PMIs falling, although now we see some moderation

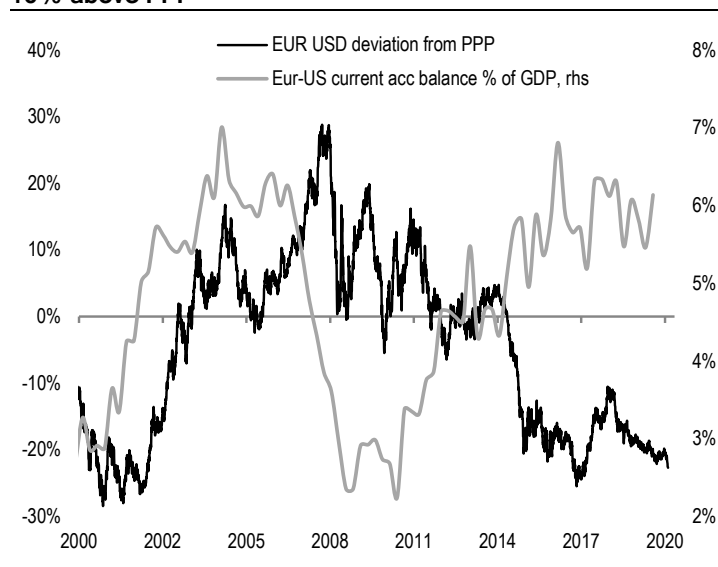


Source: Refinitiv, Markit, Credit Suisse research

- The euro is not a safety valve. The euro risks not falling very much from here. Into a global crisis, the Fed cut rates a lot more than the ECB, and hence the euro could appreciate. Assuming a quick resolution of the virus, we can see below that the euro appears to be discounting a very sharp fall in PMIs relative to the US and hence the euro would appreciate again. Moreover, the euro remains undervalued against its current account position.

Figure 44: EURUSD is pointing towards a fall in relative PMIs

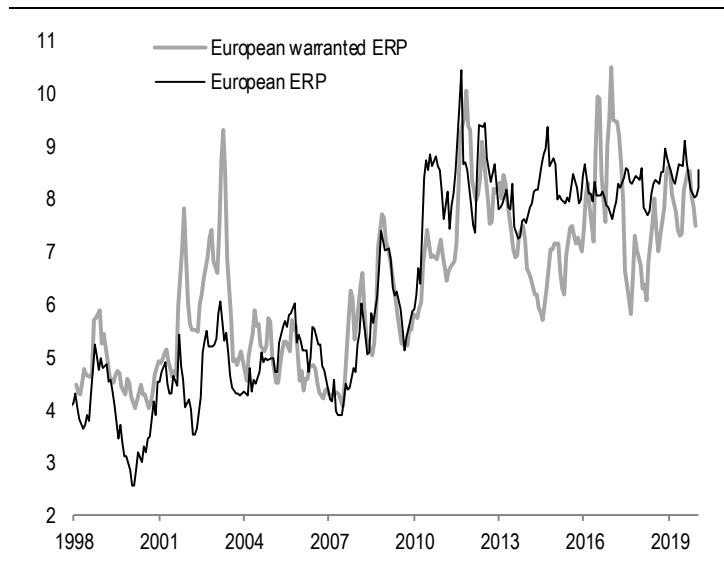
Source: Refinitiv, Markit, Credit Suisse research

Figure 45: The Eurozone current account surplus is 5% above that of the US and the last time that happened the euro was 10% above PPP

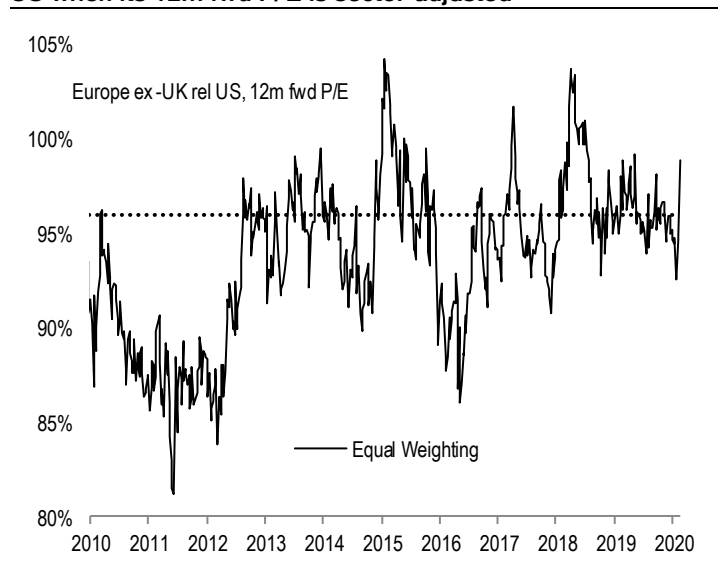
Source: Refinitiv, Credit Suisse research

Historically, 70% of the time the euro appreciates, Europe underperforms.

- While the ERP is cheap in Europe, this has been the case for some time. The sector-adjusted P/E is not that cheap.

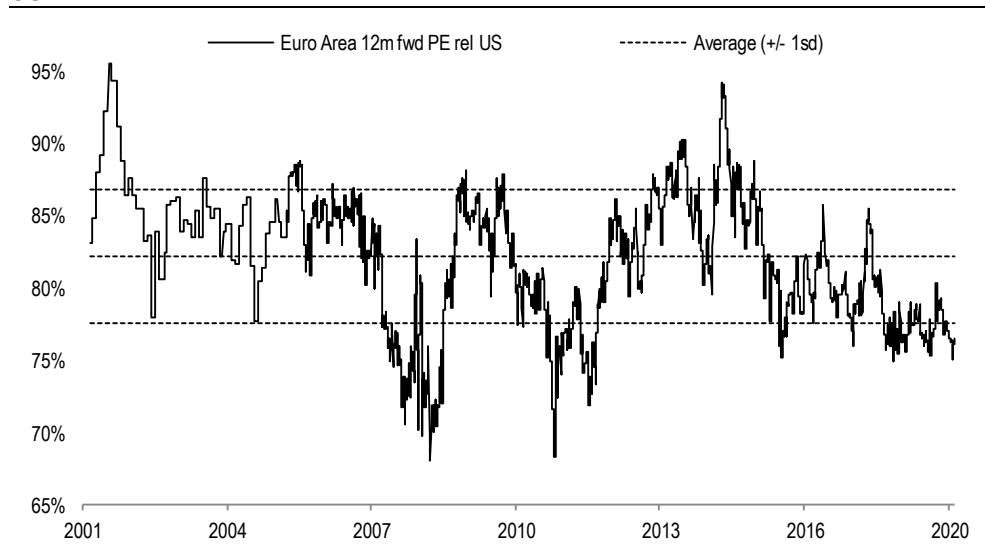
Figure 46: The warranted ERP points to a lower ERP

Source: Refinitiv, Credit Suisse research

Figure 47: Europe looks less attractively valued relative to the US when its 12m fwd P/E is sector-adjusted

Source: Refinitiv, Credit Suisse research

Figure 48: On a headline PE basis, the euro area trades at a 25% PE discount to the US

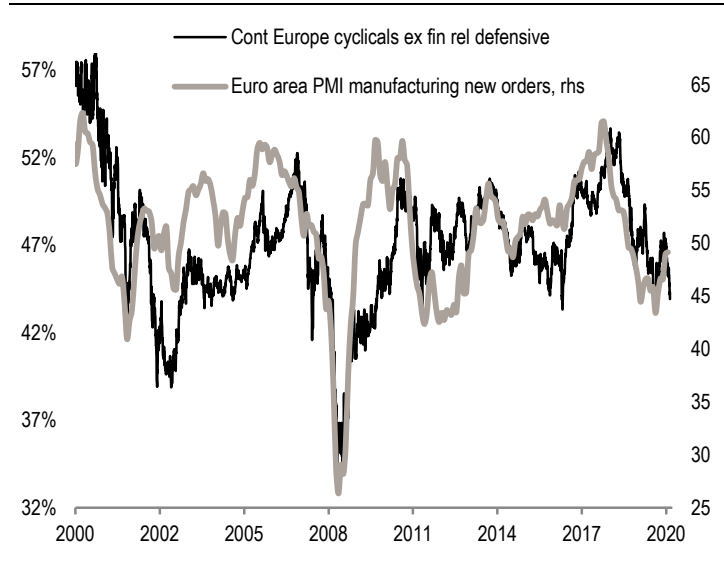


Source: Refinitiv, Credit Suisse research

European cyclicals still look attractive long term

European cyclicals are pricing in a PMI of 45 (i.e. zero growth).

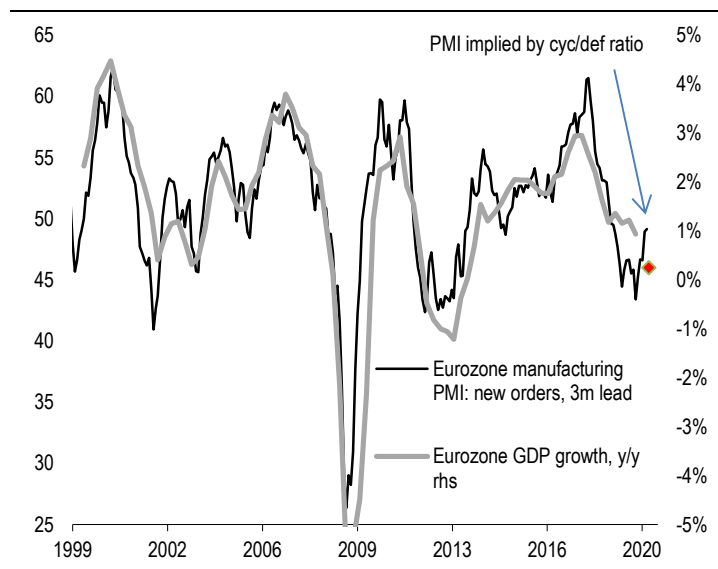
Figure 49: The cyclicals-to-defensives ratio now discounts PMIs at c45...



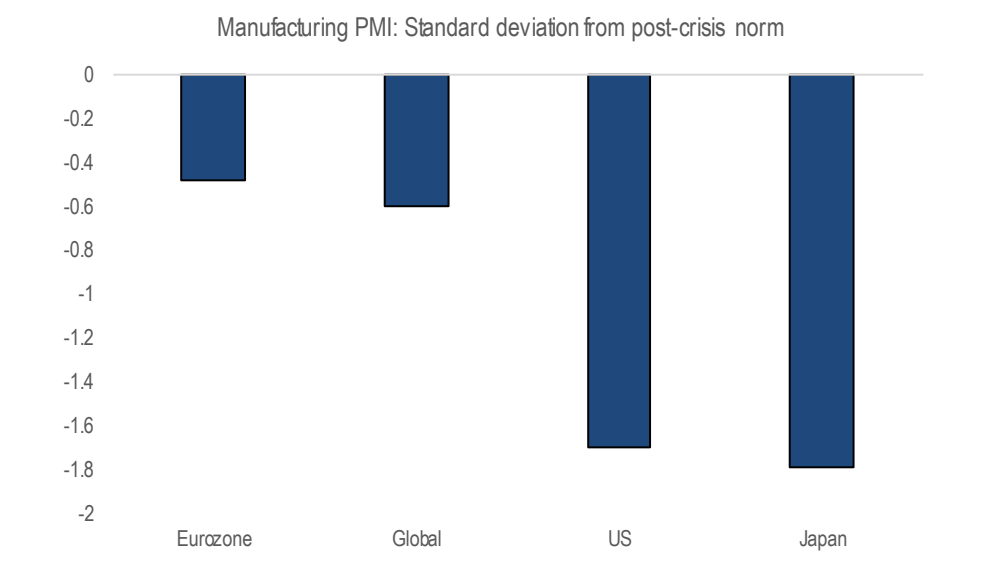
Source: Refinitiv, Markit, Credit Suisse research

We would also note that flash PMIs in Europe have been much stronger than those elsewhere, perhaps indicating that European growth is more resilient than expected.

Figure 50: ...which would be consistent with c0% GDP growth



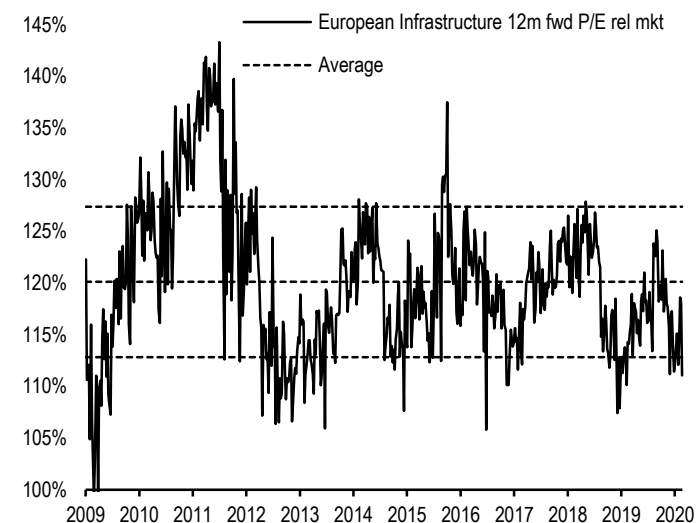
Source: Refinitiv, Markit, Credit Suisse research

Figure 51: PMIs in Europe have held up better than those elsewhere

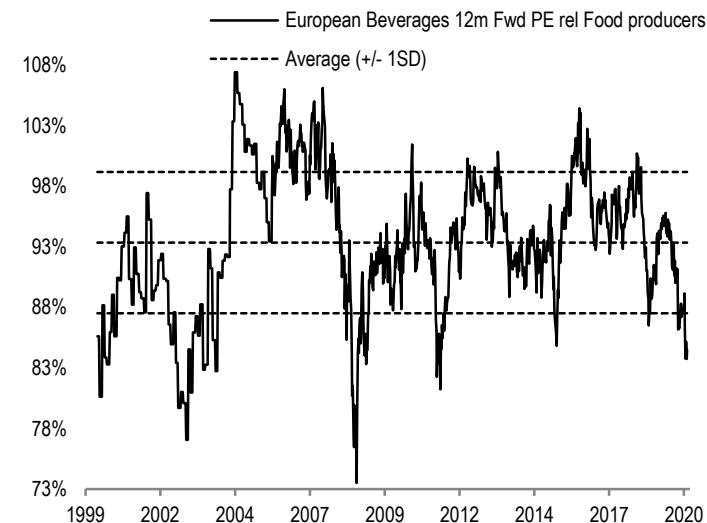
Source: Refinitiv, Markit, Credit Suisse research

Our preferred cheap non-disrupted cyclical include construction, high-end tyres, airbags and areas of mining (copper).

There are other areas that we think look too cheap. We have been big fans of the cyclical defensives (such as concessionaires and alcoholic beverages), with both trading at unusually low valuations. Please see our [2020 outlook](#) for details behind the fundamentals of our sector call.

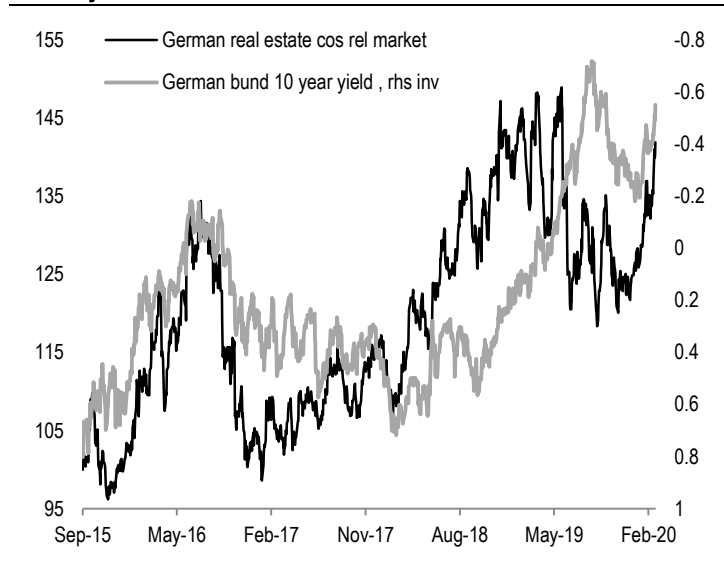
Figure 52: European Infrastructure stocks are in line with the historical average on fwd P/E rel. to the market

Source: Refinitiv, Credit Suisse research

Figure 53: European beverages at below-normal levels on 12m fwd PE relative to food producers

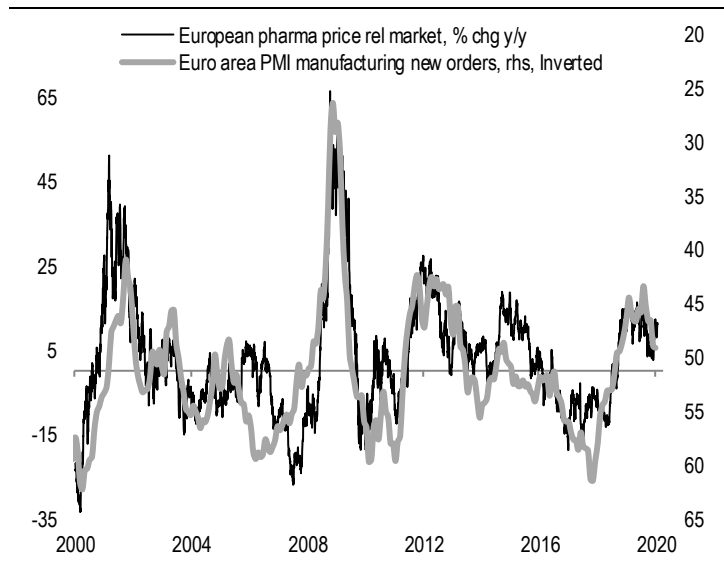
Source: Refinitiv, Credit Suisse research

Among the pure defensives, we can see a case for German real estate or tobacco, both of which have underperformed falling yields. In the case of tobacco, it could be one of those rare sectors where the technical disruption is reversing (with increased regulation of e-cigs). For more details, see [2020 Research Outlook: Themes, Sectors and Styles](#).

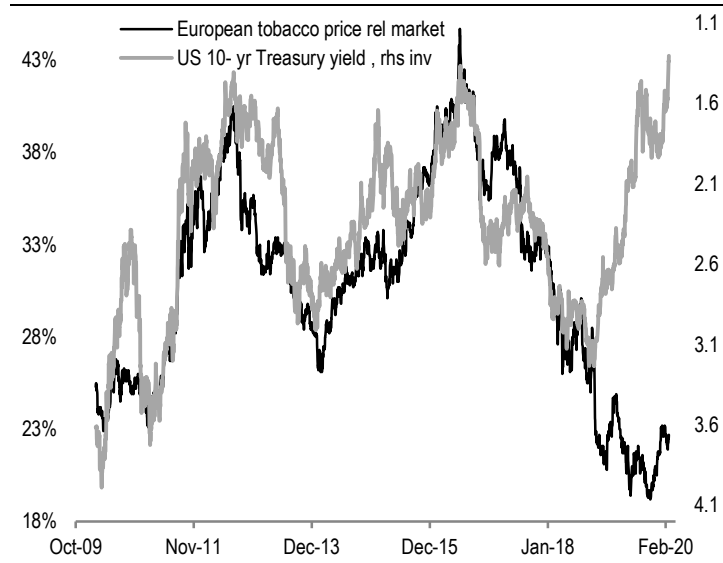
Figure 54: German real estate has underperformed bund yields recently

Source: Refinitiv, Credit Suisse research

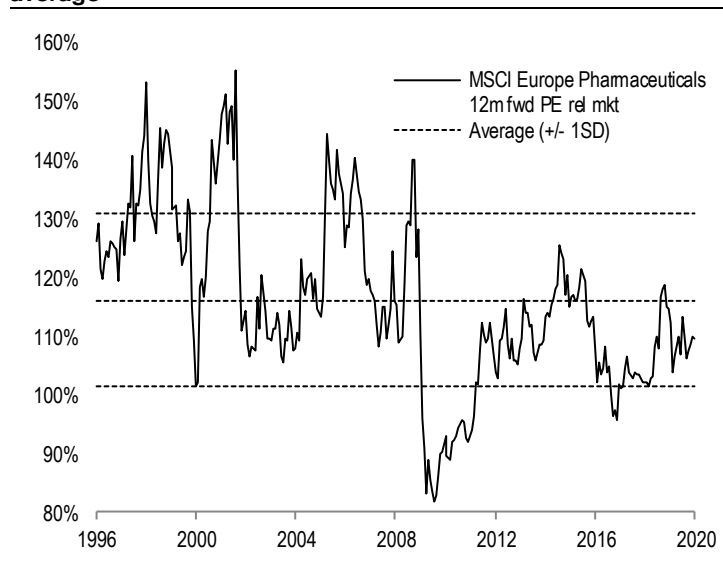
We would tactically take big cap pharma back to benchmark: the sector is the biggest winner from a fall in PMIs; there is very little leverage and PEs are middling. For now, we put our strategic concerns on hold. Ironically, in some instances the high China exposure of some of the pharma names might be a relative advantage if China gets the virus under control.

Figure 56: Pharma relative tracks PMIs closely

Source: Refinitiv, Credit Suisse research

Figure 55: Tobacco vs bond yields

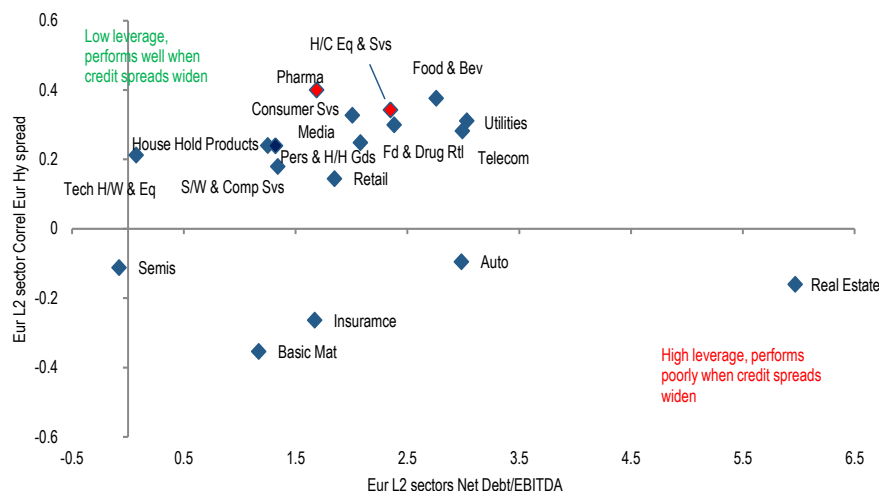
Source: Refinitiv, Credit Suisse research

Figure 57: The valuation of the sector is still slightly below average

Source: Refinitiv, Credit Suisse research

Pharma is one of the less levered defensive sectors.

Figure 58: Pharma is a less levered defensive sector and is outperforms when credit spreads rise

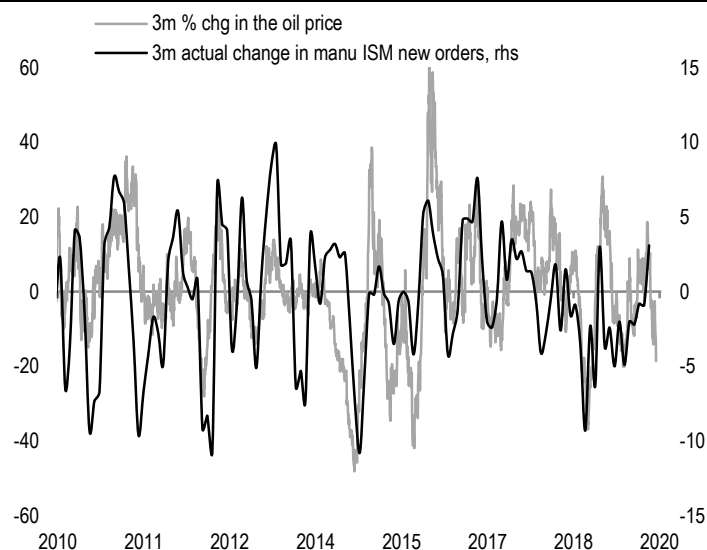


Source: Company data, Credit Suisse estimates

Commodities

Oil is discounting a 9pp fall in ISM new orders and copper a 2.5 point fall in China PMIs. This equates to US GDP growth slowing to below 1% and China GDP growth slowing to 5.5%. Therefore, copper is probably too optimistic on Chinese GDP growth.

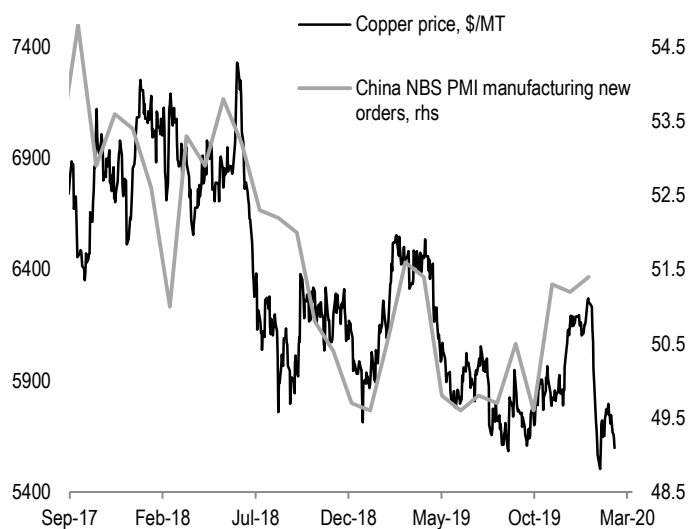
Figure 59: 3m change in oil price versus 3m change in ISM new orders



Source: Refinitiv, Credit Suisse research

We would also note that mining companies are now getting close to some appealing valuation levels. If we stress test and have 10% of production trading below the cash cost (\$2 per lb and \$50 per tons of iron ore), then the FCF yield is still 7.9%. For more details see [COVID-19: What's priced in?](#)

Figure 60: China PMI versus copper price



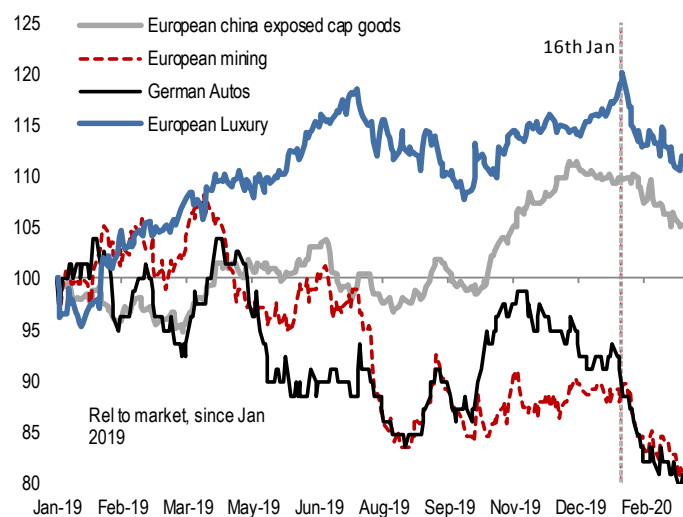
Source: Refinitiv, Credit Suisse research

Base case: What to avoid?

Luxury goods

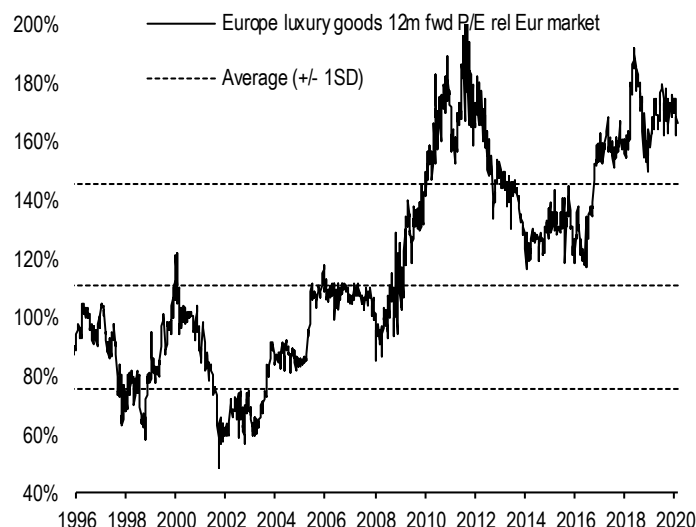
Among the China plays, luxury goods have seen the smallest underperformance and continue to look expensive despite around 40% of luxury demand and around 80% of demand growth being China-related.

Figure 61: European China plays rel mkt since 2019



Source: Refinitiv, Credit Suisse research

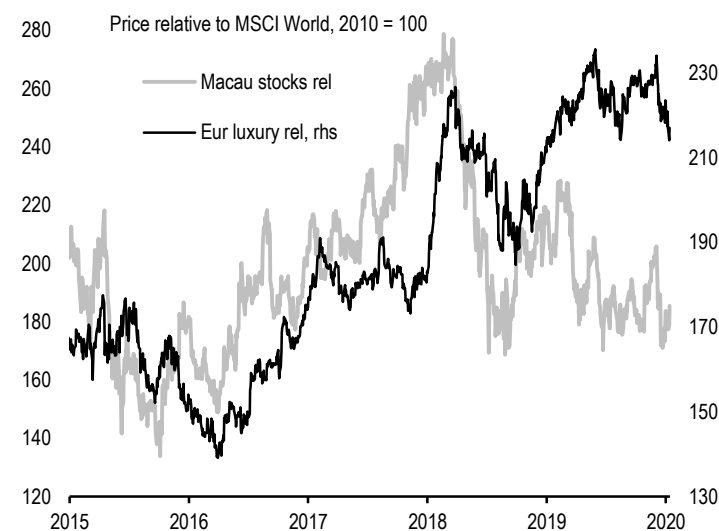
Figure 62: Luxury goods have re-rated sharply on 12m forward P/E relative to the market



Source: Refinitiv, Credit Suisse research

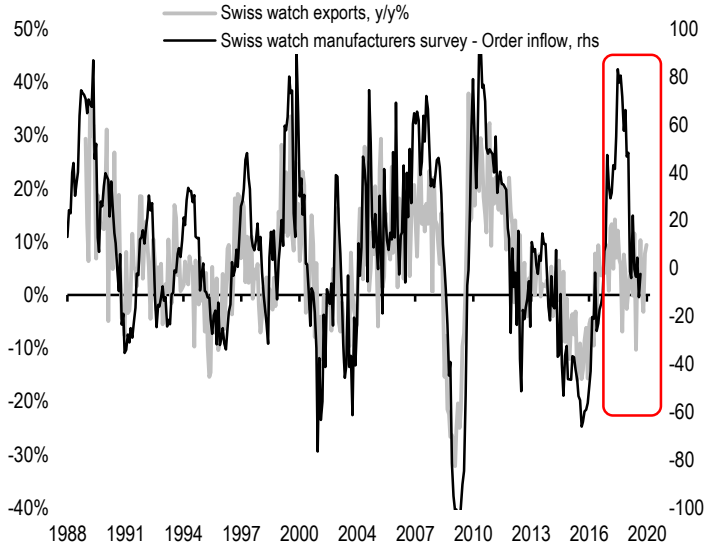
Moreover, the sector has decoupled from other historical drivers such as Macao casino revenues and Swiss watch exports.

Figure 63: European luxury decoupled from Macao stocks



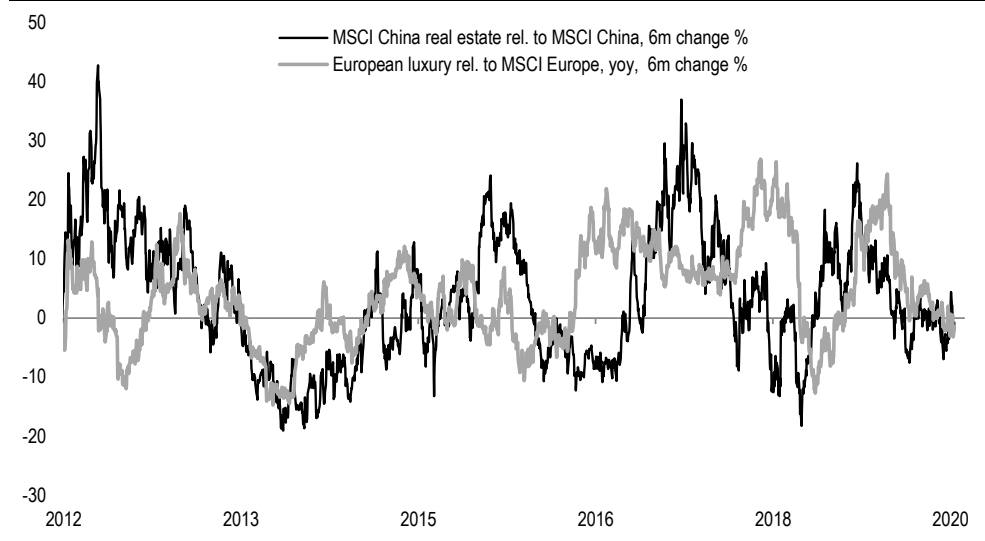
Source: Refinitiv, Credit Suisse research

Figure 64: Swiss watch exports have collapsed



Source: Refinitiv, Credit Suisse research

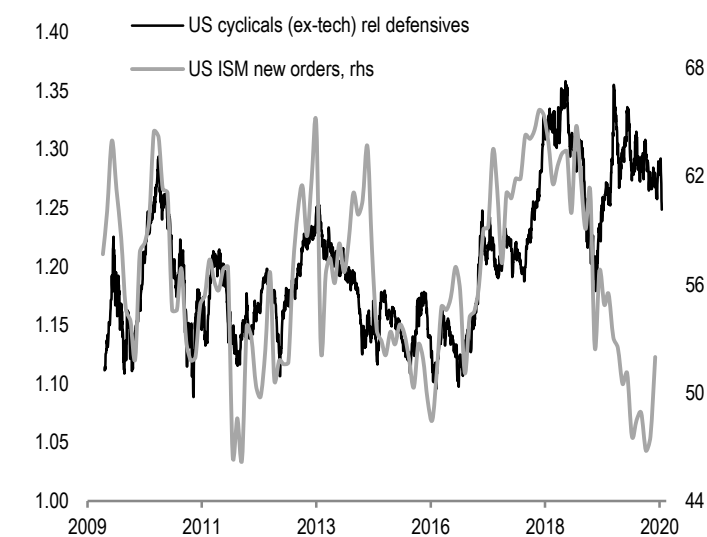
The sector is also sensitive to Chinese property prices, which look vulnerable (see below)

Figure 65: If property developers come under pressure, so should luxury

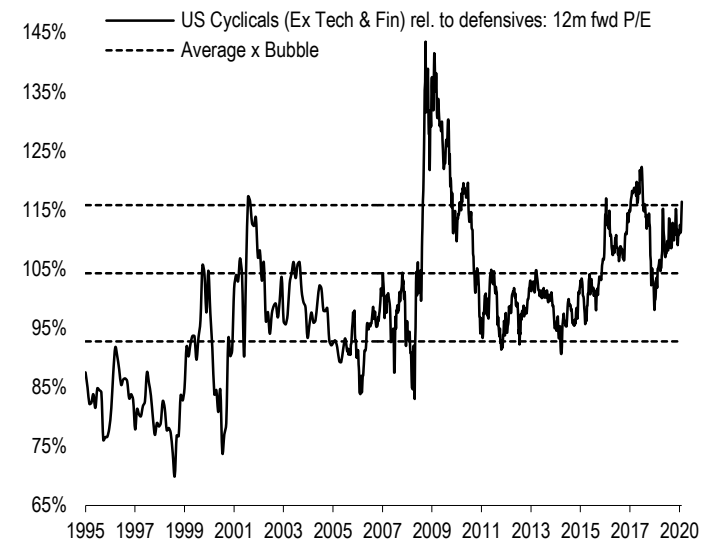
Source: Refinitiv, Credit Suisse research

US cyclicals

While European cyclicals are pricing in 0% GDP growth and look cheap (see above), US cyclicals are pricing in ISM new orders of close to 60 and are expensive.

Figure 66: US cyclicals appear to be discounting an elevated level of ISM new orders

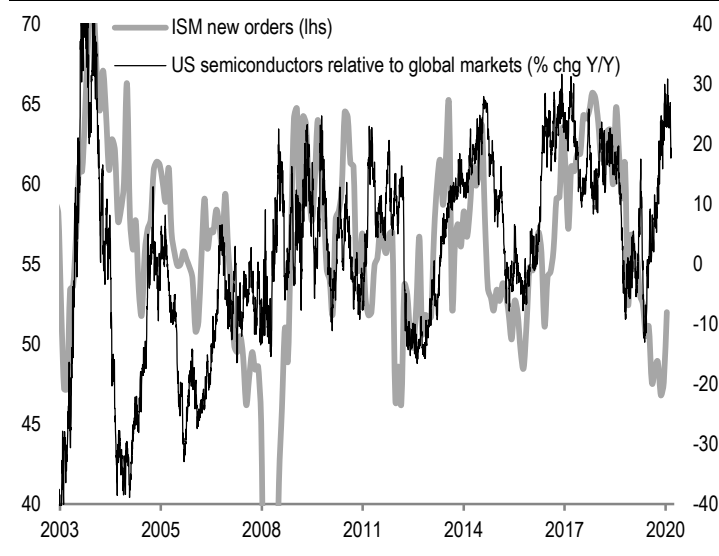
Source: Refinitiv, Credit Suisse research

Figure 67: The valuation of US cyclicals has once again become expensive on 12m fwd P/E...

Source: Refinitiv, Credit Suisse research

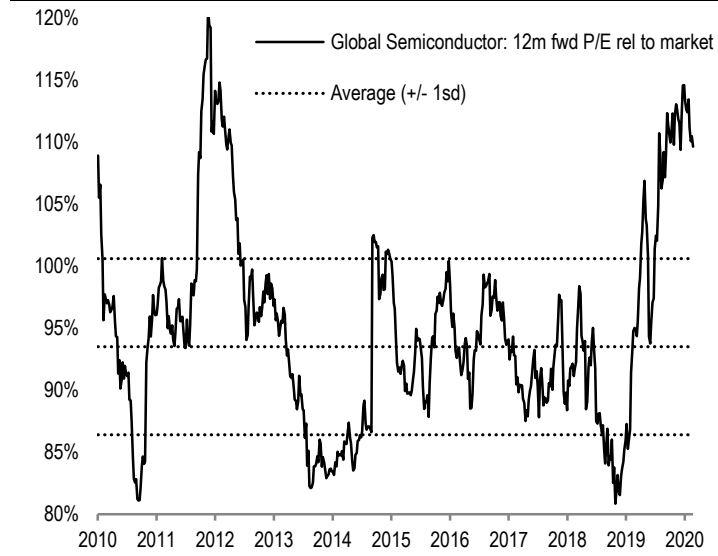
US/Global Semis

Semis have been the most cyclical sector in the US market. They are discounting ISM new orders of around 62 and are still over 2 standard deviations expensive on relative PE. We are benchmark semis with their excellent structural story balancing some of their tactical short-term risks, but we would not be surprised if there were some near-term underperformance.

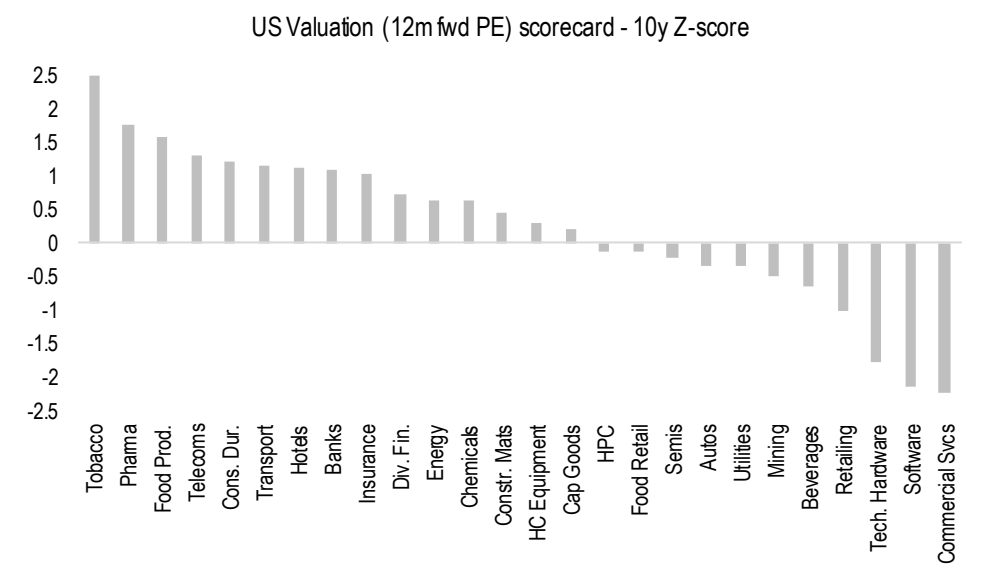
Figure 68: Semis are pricing in much higher ISM new orders

Source: Refinitiv, Credit Suisse research

We would note many of the most expensive sectors in the US are cyclical (commercial services, tech hardware, retailing, etc.).

Figure 69: Global semis look expensive on 12m fwd P/E

Source: Refinitiv, Credit Suisse research

Figure 70: Valuation (12m fwd P/E) Z-score for US sectors

Source: Refinitiv, Credit Suisse research

The risk scenario

Weighing up the risk scenario:

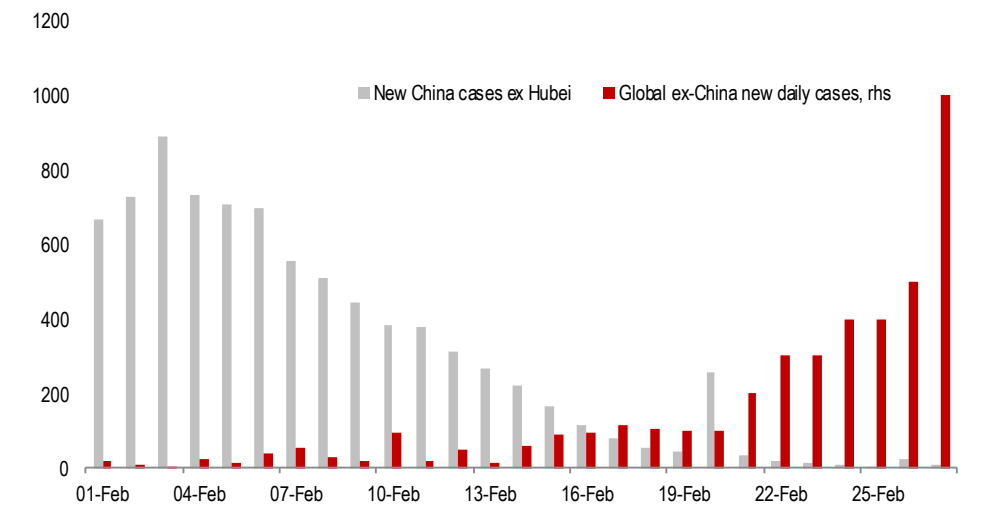
Whatever weight we put on the risk scenario, we should bear in mind that the mortality rate of Covid-19 is only 0.7% in China excluding Hubei, according to a joint assessment by NHC China and the WHO. People over the age of 60 have accounted for 81% of deaths, according to China's CDC. Epidemiology professor Neil Ferguson (Imperial College) highlights that the infection rate could be understated by a factor of 10, which would mean that the mortality rate could be even lower (closer to 0.1%; i.e. close to that seen in a normal flu season). Thus at

some point global authorities might simply limit the degree of quarantine. It is the response to the virus, not the mortality rate, which is causing the economic hit.

Nonetheless, there has been an important change in the dynamic of infections in the past week, with the number of new daily cases outside China overtaking the number of new daily cases in China, ex Hubei (even including Hubei, recent days have seen new cases in mainland China at around the same number as those in the rest of the world). The risk, therefore, is that the spread becomes a genuine global pandemic.

In such a scenario, we would see the following risks to growth and markets.

Figure 71: New daily cases outside China are now exceeding those in China ex Hubei



Source: Refinitiv, Credit Suisse research

Risk 1: Europe pursues a China-style economic shut down

Italy has had around 655 cases, and seen 17 fatalities so far. According to data collated by Johns Hopkins University, China reported a similar number of cases on 20 January; a month later, the number of cases is 77,000 (although China appears to have initially underreported the number of new cases, which we think is unlikely to be the case in Italy given much greater awareness of the illness now). Moreover, as yet there has been little or no tightening of the Schengen free travel area – and there were 513m air passengers carried intra-EU in 2018 (the latest available data), or c.1.4m per day. The risk would be if Europe were to institute an economic shutdown comparable to that seen in China. Even if not officially mandated by the government, self-quarantine by workers and companies could have a similar economic impact.

In China, a variety of real-time indicators help us to approximate the decline in economic activity over the past month. Of these, coal consumption is 37% below its normal level at this time of year, congestion is around 25% below normal levels, and passenger traffic is over 70% below its typical level at the start of the year. Taking a simple average of these three, the implication is that China is operating around 40% below its usual run rate currently.

Applying this to the euro area, we can make the following simple assumptions:

- Six weeks of the quarter see economic activity at 60% of the run rate seen in Q4;
- The remaining six weeks of the quarter see above-trend activity as delayed consumption and travel decisions are implemented, with activity 30% above normal levels.

That would, simplistically, imply a 5% decline in GDP QoQ and take YoY GDP growth down to 4.5%. This would take full-year GDP down to minus 1-2% (assuming that this is a one-quarter hit).

Reverse-engineering the relationship between PMIs and GDP growth (a step necessitated by the fact that normally forward-looking PMIs have yet to capture any virus-related downside), this would point to a manufacturing PMI of 30, 5 points above the low seen in 2009. Inevitably, that's best considered as worst case scenario, given no assumed policy response, which would inevitably offset any downside. From an EPS growth perspective, a European PMI of 30 would point to euro area EPS growth of -30%.

It is interesting to note that the London Hospital for Tropical Diseases believes that if there is a pandemic and 50% of people are affected, GDP for the full year would be 1% lower but this would be doubled to 2% owing to the government response. We believe that the market would realise that the permanent loss of growth would be much less than the near-term hit to GDP, and thus the decline in the market would not fully reflect the decline in EPS.

Figure 72: A 4.5% decline in GDP would be consistent with PMIs at around 30...



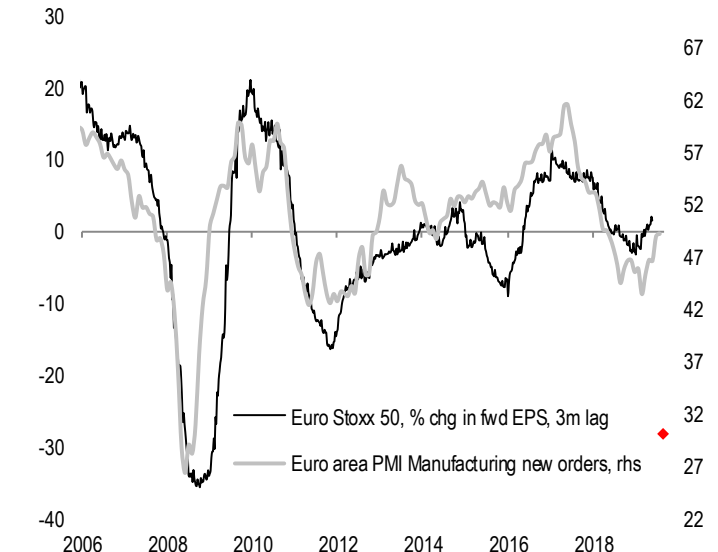
Source: Refinitiv, Markit, Credit Suisse research

The risk that a shock moves from temporary to more permanent would likely hinge on the behaviour and access to finance of SMEs, particularly in Italy, the European country hardest hit by coronavirus cases to date. SMEs account for two-thirds of Italian gross value added (the EU average is 57%) and 79% of employment (66% in the EU overall). Were cash-flow constrained SMEs to lay off workers or default on bank loans, the damage from any economic shutdown could quickly become more permanent.

The other challenge facing Europe is that the region's ability to finance and co-ordinate a policy response is inevitably more limited than that of China. Italy is already set to run a budget deficit of 2.2% of GDP in 2020, and has government debt of 137% of GDP. The German constitutional amendment enshrining the Black Zero and the EU's Growth and Stability Pact make fiscal flexibility much harder in Europe.

Moreover, the centralised nature of decision-making has allowed some significant steps to be taken in China, including reclassifying loans that go past due owing to COVID-19 and encouraging state-owned banks to buy virus-related bonds (where 10% of the proceeds have to go to combating the virus). It's not clear that Europe has the political unity or financial resources to replicate the response seen in China.

Figure 73: ...which in turn would imply a 30% contraction in European profits



Source: Refinitiv, Credit Suisse research

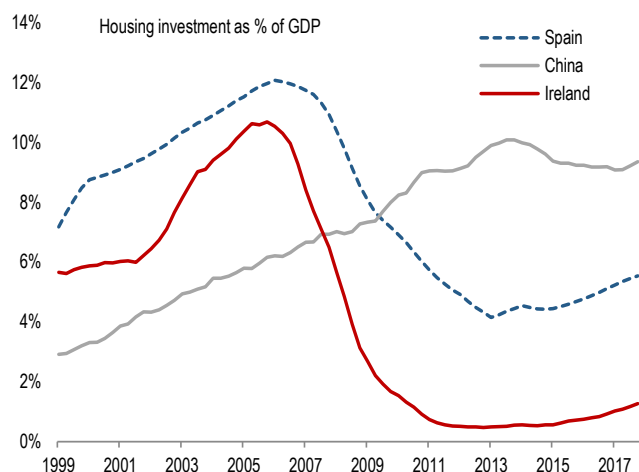
Risk 2: A collapse in Chinese property prices

Housing remains absolutely central to the Chinese economy, especially so as the economy has transitioned from investment-led growth towards consumption-driven growth. The concern we have is that property in China has looked like a bubble for a long time. Among our concerns, mortgage rates are triple rental yields, 73% of new homes are second or third properties and the increase in credit in China has been the fourth-biggest of any country over a 10-year period, with all other such episodes tending to be followed by a crash.

If the virus-related ban on viewings causes a working capital problem and emergency presales, then property prices could start to decline. We have for a long time believed that a collapse in property prices would bring an NPL crisis in its wake (around half of collateral is real estate related) and as well a sharp decline in growth (with property being half of household wealth) and government income (with real estate being around a quarter of tax revenues).

We would note that the property developers need to pay back \$270bn worth of debt over the next two years, some of which is denominated in foreign currency. In the event of a cash crunch, there could be fire sales of property in order to meet these financing needs, and this dynamic could be the catalyst for the credit bubble apparent in the data to see a disorderly outcome.

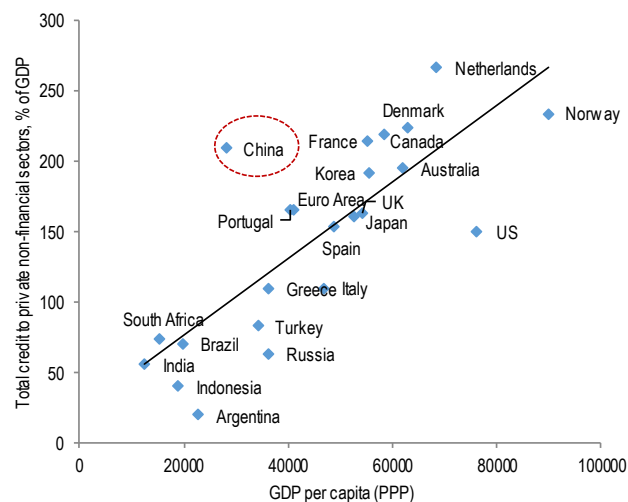
Figure 74: Chinese housing investment reached the same level as that seen in Spain and Ireland at peak



Source: Refinitiv, Credit Suisse research

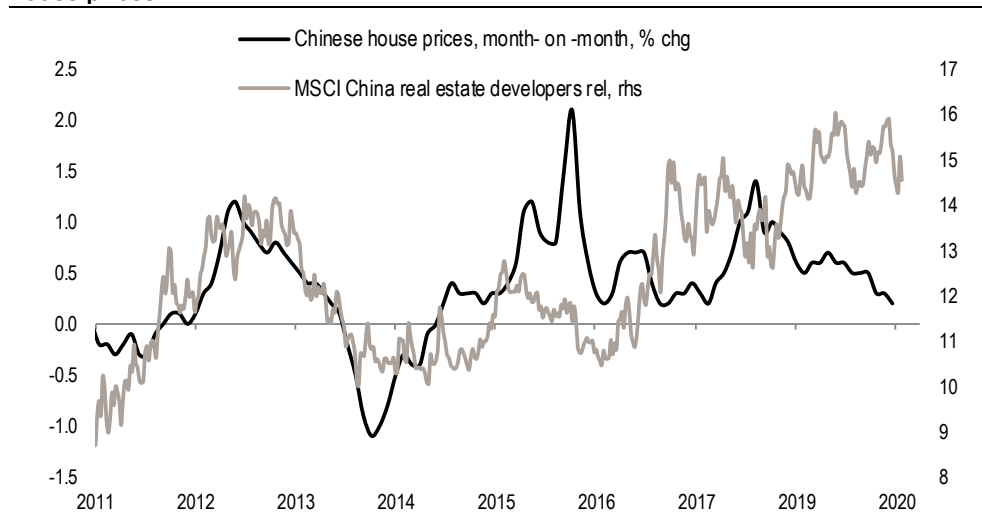
The good news at the moment is that property developers' price relative is actually consistent with little fall in house prices.

Figure 75: China remains particularly indebted given its level of GDP per capita



Source: Refinitiv, Credit Suisse research

Figure 76: Real estate developers' price relative appears consistent with steady house prices



Source: Refinitiv, Credit Suisse research

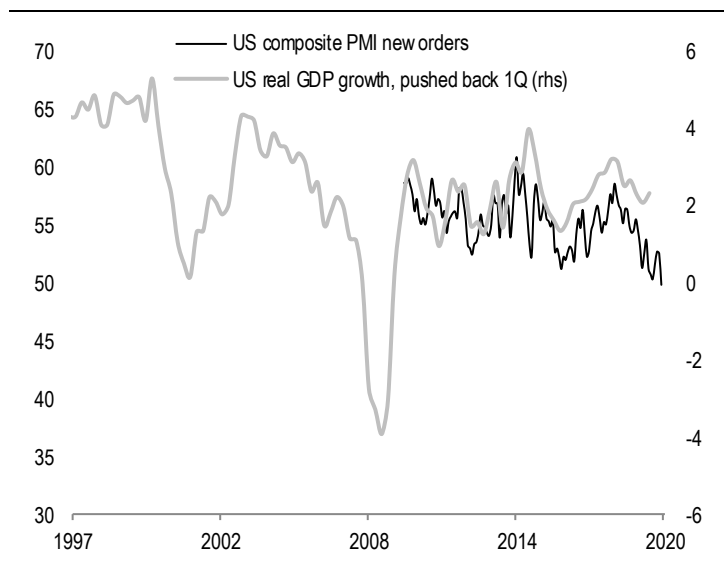
Risk 3: The US economy: soft forward-looking data, weak external outlook and USD strength

The US economy has shown itself to be something of an island in difficult global circumstances. Through the trade war, the US economy continued to deliver relatively steady growth averaging around 2%, even as growth rates in many of its trading partners in both EM and DM slowed sharply. In part that reflects the relatively closed nature of the US economy, where goods and services exports are worth only around 12% of GDP, as well as the proactive policy stance of both monetary and fiscal policymakers.

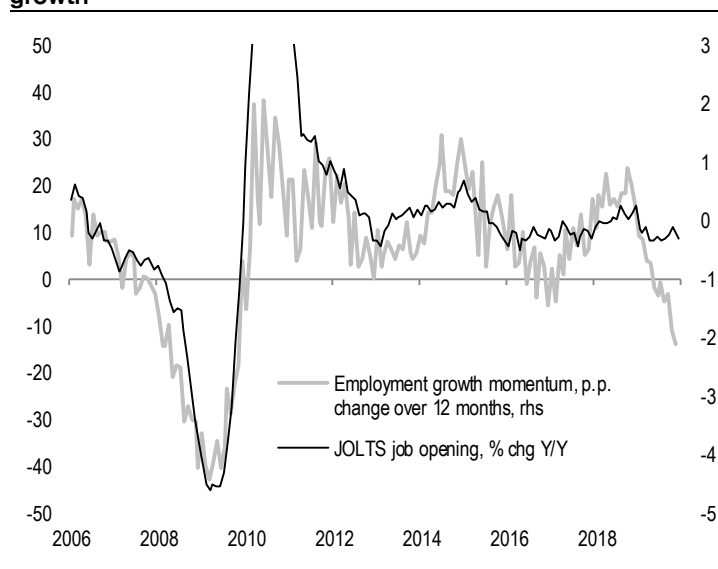
However, under a risk scenario, we would note the following challenges: there are some signs of weakening leading indicators, though lagging indicators remain strong (explaining the current strength in US macro surprises); corporate confidence is clearly fragile, and seems likely to decline further; further dollar strength would not only weigh on GDP growth at the margins, but in particular weighs on US EPS growth, given that 45% of sales come from overseas. Taking each point in turn:

■ Some softening in lead indicators

Last week saw US composite PMI new orders decline to the lowest level since the series began in 2009, a level consistent with zero GDP growth. Weakness in job openings on the JOLTS data points to a 2ppt decline in employment growth, which would be consistent with -0.6% YoY employment growth. We highlighted earlier that other lead indicators are painting a significantly different picture.

Figure 77: US composite new orders point to zero GDP growth

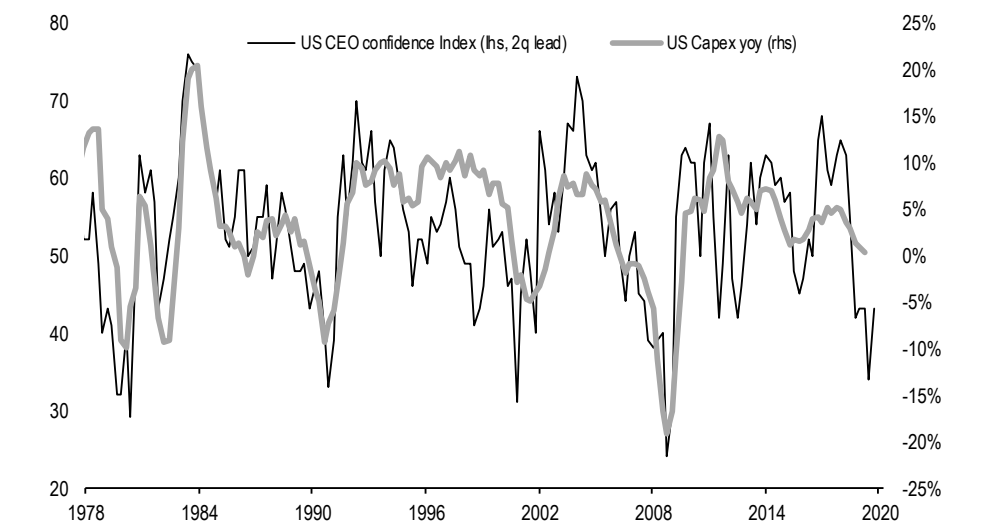
Source: Refinitiv, Credit Suisse research

Figure 78: JOLTS suggest a sharp deceleration in employment growth

Source: Refinitiv, Credit Suisse research

■ Already depressed corporate confidence

Even prior to the virus, US corporates were already reporting low levels of confidence (particularly apparent in the CEO confidence index), consistent with a further sharp decline in capex. While this is at odds with other data (Philly Fed or small company capex intentions), it remains a key concern.

Figure 79: CEO business confidence is depressed

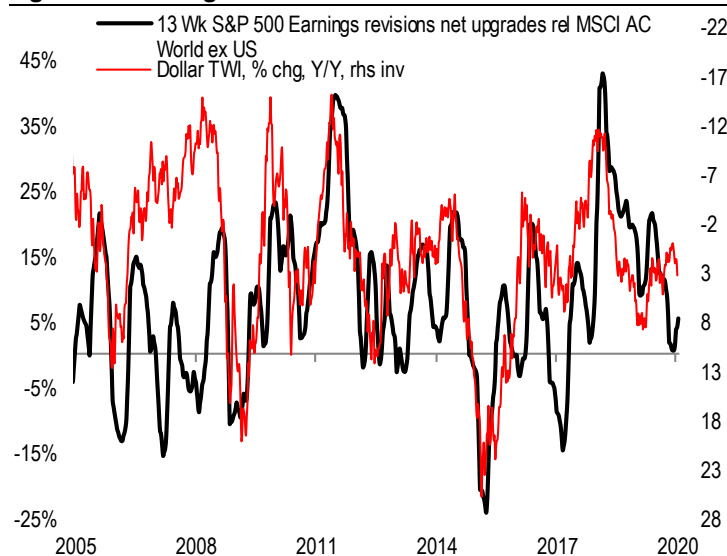
Source: Refinitiv, Credit Suisse research

■ Dollar strength

The trade-weighted dollar is already up nearly 3% this year as growth and virus fears have weighed on EM and European currencies. While the US economy is relatively closed, the US equity market has 45% of its revenues coming from overseas, and thus a 10% move higher in the USD typically takes around 5% off US EPS. As a result, with risk aversion pushing the USD higher, this could further undermine US corporate confidence, with further negative

consequences for investment and job growth. That is at a time when the deviation in the profit share from its 10-year average is already flashing a recession warning signal, as shown in the second chart below.

Figure 80: Earnings revisions in the US move with the USD



Source: Refinitiv, Credit Suisse research

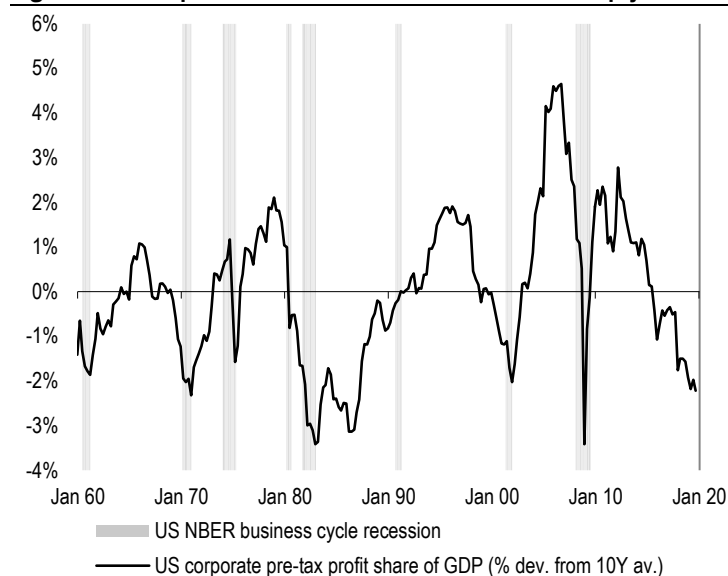
Market impact

We estimate that in global pandemic, US ISM would fall to 40 (consistent with -1.5% GDP growth). This would equate to annual GDP of 0.4%. This does assume, critically, that the policy response to the virus (which is what is causing the hit to GDP) is similar to that in China. (If the mortality rate of 0.7%, according to the WHO, is seen to fall sharply and be similar to flu, where the mortality rate is 0.1%, then this quarantine and the hit to GDP would likely be much less.) In turn, that would point to an EPS contraction of 15%. On the multiple side, our simple two-factor model of the fair value US P/E, driven by US TIPS yields and ISM, was pointing to around 10% downside to the valuation two weeks ago, and now, at the current level of ISM, points to the S&P as being at fair value.

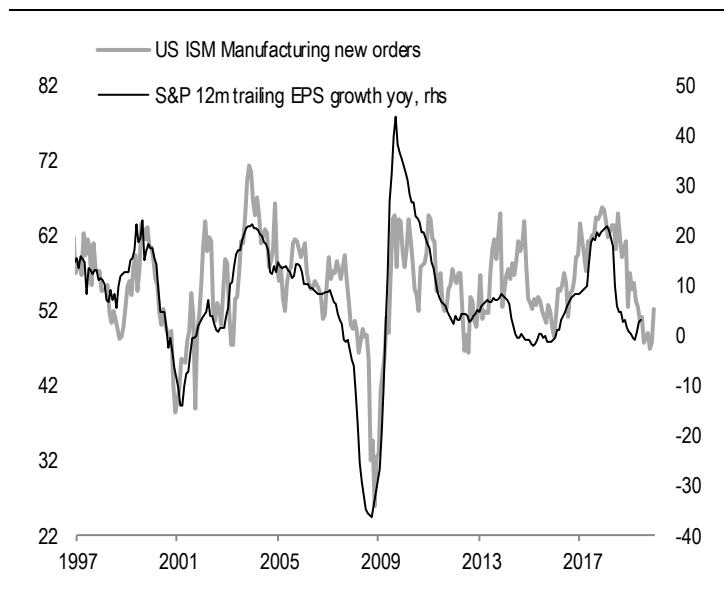
If, consistent with the comments above, we assume ISM declining to 40 and TIPS yields remaining unchanged at these depressed levels (of minus 30bp), our PE model gives us fair value of 16.8x (which serves to highlight the importance of TIPS yields in driving this model's output). That said, in prior sell-offs in recent years, we have seen the actual PE decline to around one point below our estimate of fair value, which would imply 5% downside to a multiple of 16x.

Combining these two factors – earnings and multiple – would imply a risk case downside to the S&P 500 of 2590 or close to S&P 2,500 if we have the normal overshoot in our model.

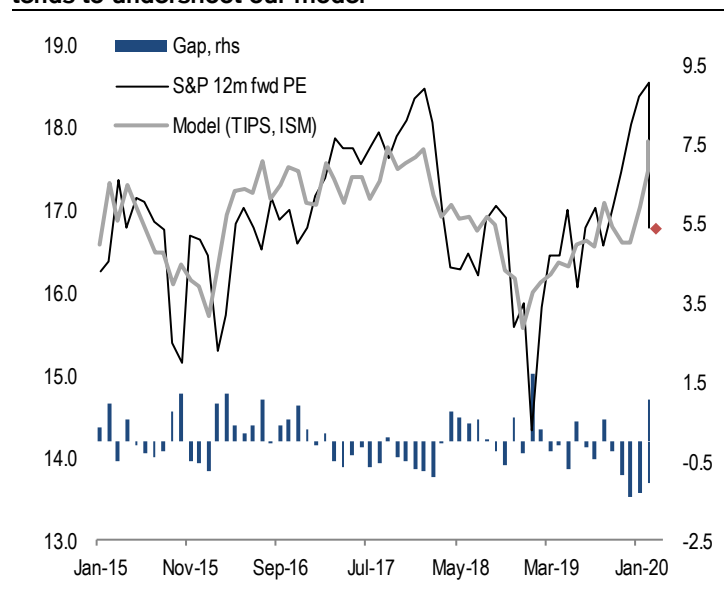
Figure 81: The profit share of GDP has declined sharply



Source: Refinitiv, Credit Suisse research

Figure 82: An ISM of 40 would be consistent with -15% EPS growth

Source: Refinitiv, Credit Suisse research

Figure 83: An ISM of 40 and unchanged TIPS yields would point to the S&P multiple currently being fair value, though it tends to undershoot our model

Source: Refinitiv, Credit Suisse research

Using these inputs in our ERP model, an ISM of 40 and credit spreads widening by 140bps would be consistent with a warranted ERP of 7.1%. To get the actual ERP to this warranted level, along with a fall in EPS of 15%, would require, all else equal, a 17% decline (c2460) in the S&P.

Figure 84: ERP risk analysis

Current (S&P level: 2979)			
ERP (on forward estimates)	7.06	Warranted ERP (ISM and credit spreads)	4.83
Implied S&P			
Scenario: ISM falls to 40 (from 52), credit spreads widen by 140bps			
EPS falls by 15%		Warranted ERP (ISM and credit spreads)	7.12
Actual ERP goes to warranted levels			
S&P level	2463	Downside	-17.3%

Source: Refinitiv, Credit Suisse research

What would make the risk case become our base case?

- A reacceleration in Covid-19 infection rates in the EU or China (as people get back to work);
- An extended period of credit market distress leading to bankruptcies among SMEs in the US and Europe, creating a spike in unemployment and decline in consumer confidence;
- A slower-than-expected return to normal activity levels in China, threatening global supply chains into the second quarter, forcing broader supply shutdowns across industries;
- A decline in Chinese house prices.

What are the key variables to monitor:

- Infection-rate data.
- The speed at which China gets back to work and whether the infection rate rises again.
- European flash PMIs for March and the ECB policy response to corporate liquidity problems.
- Of the market-related variables, we look at the Thai baht (Thailand has 12% of GDP from tourism, of which one-quarter is from China) and copper prices (given its very tight correlation to PMIs).

Appendix

Figure 85: Free cash flow yields for the sector remain reasonably attractive even under a stress test scenario

		Base		Spot		Stress 1		Stress 2	
	2019	2020	2021	2020	2021	2020	2021	2020	2021
BHP Group	12.6%	10.1%	9.0%	10.2%	10.2%	4.8%	4.5%	1.6%	0.7%
Rio Tinto	15.1%	16.5%	14.2%	16.7%	17.1%	9.0%	6.8%	4.8%	1.1%
Glencore	9.6%	17.6%	18.5%	15.3%	17.6%	8.1%	9.8%	3.7%	5.0%
Anglo American	8.0%	13.2%	8.3%	16.3%	16.5%	10.1%	9.1%	6.7%	5.2%
Average	11.3%	14.4%	12.5%	14.6%	15.4%	8.0%	7.5%	4.2%	3.0%
Median	11.1%	14.9%	11.6%	15.8%	16.8%	8.6%	8.0%	4.3%	3.0%

Stress 1: Iron Ore US\$50/t; Copper US\$2.0/lb; Thermal Coal US\$60/t; Coking US\$120/t

Stress 2: Iron Ore US\$30/t; Copper US\$1.55/lb; Thermal Coal US\$55/t; Coking US\$100/t

Source: Credit Suisse European Metals & Mining research

Companies Mentioned (Price as of 26-Feb-2020)

Boohoo Group (BOOH.L, 304.0p)
Cathay Pacific Airways Ltd (0293.HK, HK\$10.18)
Hon Hai Precision (2317.TW, NT\$81.1)
Inditex (ITX.MC, €29.25)
JVC Kenwood (6632.T, ¥250)
Philips (PHG.AS, €40.48)

Disclosure Appendix

Analyst Certification

I, Andrew Garthwaite, certify that (1) the views expressed in this report accurately reflect my personal views about all of the subject companies and securities and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this report.

As of December 10, 2012 Analysts' stock rating are defined as follows:

Outperform (O) : The stock's total return is expected to outperform the relevant benchmark* over the next 12 months.

Neutral (N) : The stock's total return is expected to be in line with the relevant benchmark* over the next 12 months.

Underperform (U) : The stock's total return is expected to underperform the relevant benchmark* over the next 12 months.

*Relevant benchmark by region: As of 10th December 2012, Japanese ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. As of 2nd October 2012, U.S. and Canadian as well as European (excluding Turkey) ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. For Latin America, Turkey and Asia (excluding Japan and Australia), stock ratings are based on a stock's total return relative to the average total return of the relevant country or regional benchmark (India - S&P BSE Sensex Index); prior to 2nd October 2012 U.S. and Canadian ratings were based on (1) a stock's absolute total return potential to its current share price and (2) the relative attractiveness of a stock's total return potential within an analyst's coverage universe. For Australian and New Zealand stocks, the expected total return (ETR) calculation includes 12-month rolling dividend yield. An Outperform rating is assigned where an ETR is greater than or equal to 7.5%; Underperform where an ETR less than or equal to 5%. A Neutral may be assigned where the ETR is between -5% and 15%. The overlapping rating range allows analysts to assign a rating that puts ETR in the context of associated risks. Prior to 18 May 2015, ETR ranges for Outperform and Underperform ratings did not overlap with Neutral thresholds between 15% and 7.5%, which was in operation from 7 July 2011.

Restricted (R) : In certain circumstances, Credit Suisse policy and/or applicable law and regulations preclude certain types of communications, including an investment recommendation, during the course of Credit Suisse's engagement in an investment banking transaction and in certain other circumstances.

Not Rated (NR) : Credit Suisse Equity Research does not have an investment rating or view on the stock or any other securities related to the company at this time.

Not Covered (NC) : Credit Suisse Equity Research does not provide ongoing coverage of the company or offer an investment rating or investment view on the equity security of the company or related products.

Volatility Indicator [V] : A stock is defined as volatile if the stock price has moved up or down by 20% or more in a month in at least 8 of the past 24 months or the analyst expects significant volatility going forward.

Analysts' sector weightings are distinct from analysts' stock ratings and are based on the analyst's expectations for the fundamentals and/or valuation of the sector* relative to the group's historic fundamentals and/or valuation:

Overweight : The analyst's expectation for the sector's fundamentals and/or valuation is favorable over the next 12 months.

Market Weight : The analyst's expectation for the sector's fundamentals and/or valuation is neutral over the next 12 months.

Underweight : The analyst's expectation for the sector's fundamentals and/or valuation is cautious over the next 12 months.

*An analyst's coverage sector consists of all companies covered by the analyst within the relevant sector. An analyst may cover multiple sectors.

Credit Suisse's distribution of stock ratings (and banking clients) is:

Global Ratings Distribution

Rating	Versus universe (%)	Of which banking clients (%)
Outperform/Buy*	47%	(33% banking clients)
Neutral/Hold*	38%	(27% banking clients)
Underperform/Sell*	13%	(22% banking clients)
Restricted	2%	

*For purposes of the NYSE and FINRA ratings distribution disclosure requirements, our stock ratings of Outperform, Neutral, and Underperform most closely correspond to Buy, Hold, and Sell, respectively; however, the meanings are not the same, as our stock ratings are determined on a relative basis. (Please refer to definitions above.) An investor's decision to buy or sell a security should be based on investment objectives, current holdings, and other individual factors.

Important Global Disclosures

Credit Suisse's research reports are made available to clients through our proprietary research portal on CS PLUS. Credit Suisse research products may also be made available through third-party vendors or alternate electronic means as a convenience. Certain research products are only made available through CS PLUS. The services provided by Credit Suisse's analysts to clients may depend on a specific client's preferences regarding the frequency and manner of receiving communications, the client's risk profile and investment, the size and scope of the overall client relationship with the Firm, as well as legal and regulatory constraints. To access all of Credit Suisse's research that you are entitled to receive in the most timely manner, please contact your sales representative or go to <https://plus.credit-suisse.com>.

Credit Suisse's policy is to update research reports as it deems appropriate, based on developments with the subject company, the sector or the market that may have a material impact on the research views or opinions stated herein.

Credit Suisse's policy is only to publish investment research that is impartial, independent, clear, fair and not misleading. For more detail please refer to Credit Suisse's Policies for Managing Conflicts of Interest in connection with Investment Research: <https://www.credit-suisse.com/sites/disclaimers-ib/en/managing-conflicts.html>.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

Credit Suisse has decided not to enter into business relationships with companies that Credit Suisse has determined to be involved in the development, manufacture, or acquisition of anti-personnel mines and cluster munitions. For Credit Suisse's position on the issue, please see

The analyst(s) responsible for preparing this research report received compensation that is based upon various factors including Credit Suisse's total revenues, a portion of which are generated by Credit Suisse's investment banking activities

See the Companies Mentioned section for full company names

Credit Suisse currently has, or had within the past 12 months, the following as investment banking client(s): PHG.AS

Credit Suisse provided investment banking services to the subject company (PHG.AS) within the past 12 months.

Within the last 12 months, Credit Suisse has received compensation for non-investment banking services or products from the following issuer(s): ITX.MC

Credit Suisse expects to receive or intends to seek investment banking related compensation from the subject company (BOOH.L, 2317.TW, PHG.AS) within the next 3 months.

Credit Suisse currently has, or had within the past 12 months, the following issuer(s) as client(s), and the services provided were non-investment-banking, securities-related: ITX.MC

Credit Suisse currently has, or had within the past 12 months, the following issuer(s) as client(s), and the services provided were non-investment-banking, non securities-related: ITX.MC

Credit Suisse acts as a market maker in the shares, depositary receipts, interests or units issued by, and/or any warrants or options on these shares, depositary receipts, interests or units of the following subject issuer(s): 0293.HK.

Credit Suisse or a member of the Credit Suisse Group is a market maker or liquidity provider in the securities of the following subject issuer(s): BOOH.L, 0293.HK, 2317.TW, ITX.MC, 6632.T, PHG.AS

A member of the Credit Suisse Group is party to an agreement with, or may have provided services set out in sections A and B of Annex I of Directive 2014/65/EU of the European Parliament and Council ("MiFID Services") to, the subject issuer (PHG.AS) within the past 12 months.

For date and time of production, dissemination and history of recommendation for the subject company(ies) featured in this report, disseminated within the past 12 months, please refer to the link: <https://rave.credit-suisse.com/disclosures/view/report?i=495803&v=64r2g3gkqn305wpgv47gjgh4>.

Important Regional Disclosures

Singapore recipients should contact Credit Suisse AG, Singapore Branch for any matters arising from this research report.

The analyst(s) involved in the preparation of this report may participate in events hosted by the subject company, including site visits. Credit Suisse does not accept or permit analysts to accept payment or reimbursement for travel expenses associated with these events.

For Credit Suisse Securities (Canada), Inc.'s policies and procedures regarding the dissemination of equity research, please visit <https://www.credit-suisse.com/sites/disclaimers-ib/en/canada-research-policy.html>.

Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment.

This research report is authored by:

Credit Suisse International Andrew Garthwaite ; Robert Griffiths ; Nicolas Wylenzek ; Mengyuan Yuan ; Asim Ali ; Timothy O'Sullivan

To the extent this is a report authored in whole or in part by a non-U.S. analyst and is made available in the U.S., the following are important disclosures regarding any non-U.S. analyst contributors: The non-U.S. research analysts listed below (if any) are not registered/qualified as research analysts with FINRA. The non-U.S. research analysts listed below may not be associated persons of CSSU and therefore may not be subject to the FINRA 2241 and NYSE Rule 472 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

Credit Suisse International Andrew Garthwaite ; Robert Griffiths ; Nicolas Wylenzek ; Mengyuan Yuan ; Asim Ali ; Timothy O'Sullivan

Important MSCI Disclosures

The MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, re-disseminated or used to create and financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates.

The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of Morgan Stanley Capital International Inc. and Standard & Poor's. GICS is a service mark of MSCI and S&P and has been licensed for use by Credit Suisse.

Important Credit Suisse HOLT Disclosures

The HOLT methodology does not assign ratings or a target price to a security. It is an analytical tool that involves use of a set of proprietary quantitative algorithms and warranted value calculations, collectively called the HOLT valuation model, that are consistently applied to all the companies included in its database. Third-party data (including consensus earnings estimates) are systematically translated into a number of default variables and incorporated into the algorithms available in the HOLT valuation model. The source financial statement, pricing, and earnings data provided by outside data vendors are subject to quality control and may also be adjusted to more closely measure the underlying economics of firm performance. These adjustments provide consistency when analyzing a single company across time, or analyzing multiple companies across industries or national borders. The default scenario that is produced by the HOLT valuation model establishes a warranted price for a security, and as the third-party data are updated, the warranted price may also change. The default variables may also be adjusted to produce alternative warranted prices, any of which could occur. The warranted price is an algorithmic output applied systematically across all companies based on historical levels and volatility of returns. Additional information about the HOLT methodology is available on request.

CFROI, CFROE, HOLT, HOLT Lens, HOLTfolio, "Clarity is Confidence" and "Powered by HOLT" are trademarks or registered trademarks of Credit Suisse Group AG or its affiliates in the United States and other countries.

HOLT is a corporate performance and valuation advisory service of Credit Suisse.

© 2020 Credit Suisse Group AG and its subsidiaries and affiliates. All rights reserved.

Important disclosures regarding companies that are the subject of this report are available by calling +1 (877) 291-2683. The same important disclosures, with the exception of valuation methodology and risk discussions, are also available on Credit Suisse's disclosure website at <https://rave.credit-suisse.com/disclosures>. For valuation methodology and risks associated with any recommendation, price target, or rating referenced in this report, please refer to the disclosures section of the most recent report regarding the subject company.

This report is produced by subsidiaries and affiliates of Credit Suisse operating under its Global Markets Division. For more information on our structure, please use the following link: <https://www.credit-suisse.com/who-we-are>. This report may contain material that 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 which would subject Credit Suisse or its affiliates ("CS") to any registration or licensing requirement within such jurisdiction. All material presented in this report, unless specifically indicated otherwise, is under copyright to CS. None of the material, nor its content, nor any copy of it, may be altered in any way, transmitted to, copied or distributed to any other party, without the prior express written permission of CS. All trademarks, service marks and logos used in this report are trademarks or service marks or registered trademarks or service marks of CS or its affiliates. The information, tools and material presented in this report are provided to you for information purposes only and are not to be used or considered as an offer or the solicitation of an offer to sell or to buy or subscribe for securities or other financial instruments. CS may not have taken any steps to ensure that the securities referred to in this report are suitable for any particular investor. CS will not treat recipients of this report as its customers by virtue of their receiving this report. The investments and services contained or referred to in this report may not be suitable for you and it is recommended that you consult an independent investment advisor if you are in doubt about such investments or investment services. Nothing in this report constitutes investment, legal, accounting or tax advice, or a representation that any investment or strategy is suitable or appropriate to your individual circumstances, or otherwise constitutes a personal recommendation to you. Please note in particular that the bases and levels of taxation may change. Information and opinions presented in this report have been obtained or derived from sources believed by CS to be reliable, but CS makes no representation as to their accuracy or completeness. CS accepts no liability for loss arising from the use of the material presented in this report, except that this exclusion of liability does not apply to the extent that such liability arises under specific statutes or regulations applicable to CS. This report is not to be relied upon in substitution for the exercise of independent judgment. CS may have issued, and may in the future issue, other communications that are inconsistent with, and reach different conclusions from, the information presented in this report. Those communications reflect the different assumptions, views and analytical methods of the analysts who prepared them and CS is under no obligation to ensure that such other communications are brought to the attention of any recipient of this report. Some investments referred to in this report will be offered solely by a single entity and in the case of some investments solely by CS, or an associate of CS or CS may be the only market maker in such investments. Past performance should not be taken as an indication or guarantee of future performance, and no representation or warranty, express or implied, is made regarding future performance. Information, opinions and estimates contained in this report reflect a judgment at its original date of publication by CS and are subject to change without notice. The price, value of and income from any of the securities or financial instruments mentioned in this report can fall as well as rise. The value of securities and financial instruments is subject to exchange rate fluctuation that may have a positive or adverse effect on the price or income of such securities or financial instruments. Investors in securities such as ADRs, the values of which are influenced by currency volatility, effectively assume this risk. Structured securities are complex instruments, typically involve a high degree of risk and are intended for sale only to sophisticated investors who are capable of understanding and assuming the risks involved. The market value of any structured security may be affected by changes in economic, financial and political factors (including, but not limited to, spot and forward interest and exchange rates), time to maturity, market conditions and volatility, and the credit quality of any issuer or reference issuer. Any investor interested in purchasing a structured product should conduct their own investigation and analysis of the product and consult with their own professional advisers as to the risks involved in making such a purchase. Some investments discussed in this report may have a high level of volatility. High volatility investments may experience sudden and large falls in their value causing losses when that investment is realised. Those losses may equal your original investment. Indeed, in the case of some investments the potential losses may exceed the amount of initial investment and, in such circumstances, you may be required to pay more money to support those losses. Income yields from investments may fluctuate and, in consequence, initial capital paid to make the investment may be used as part of that income yield. Some investments may not be readily realisable and it may be difficult to sell or realise those investments, similarly it may prove difficult for you to obtain reliable information about the value, or risks, to which such an investment is exposed. This report may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the report refers to website material of CS, CS has not reviewed any such site and takes no responsibility for the content contained therein. Such address or hyperlink (including addresses or hyperlinks to CS's own website material) is provided solely for your convenience and information and the content of any such website does not in any way form part of this document. Accessing such website or following such link through this report or CS's website shall be at your own risk.

This report is issued and distributed in **European Union (except Switzerland)**: by Credit Suisse Securities (Europe) Limited, One Cabot Square, London E14 4QJ, England, which is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. **Germany**: Credit Suisse (Deutschland) Aktiengesellschaft regulated by the Bundesanstalt fuer Finanzdienstleistungsaufsicht ("BaFin"). **United States and Canada**: Credit Suisse Securities (USA) LLC; **Switzerland**: Credit Suisse AG; **Brazil**: Banco de Investimentos Credit Suisse (Brasil) S.A. or its affiliates; **Mexico**: Banco Credit Suisse (México), S.A., Institución de Banca Múltiple, Grupo Financiero Credit Suisse (México) and Casa de Bolsa Credit Suisse (México), S.A. de C.V., Grupo Financiero Credit Suisse (México) ("Credit Suisse México"). This document has been prepared for information purposes only and is exclusively distributed in Mexico to Institutional Investors. Credit Suisse México is not responsible for any onward distribution of this report to non-institutional investors by any third party. The authors of this report have not received payment or compensation from any entity or company other than from the relevant Credit Suisse Group company employing them; **Japan**: by Credit Suisse Securities (Japan) Limited, Financial Instruments Firm, Director-General of Kanto Local Finance Bureau (Kinsho) No. 66, a member of Japan Securities Dealers Association, The Financial Futures Association of Japan, Japan Investment Advisers Association, Type II Financial Instruments Firms Association; **Hong Kong**: Credit Suisse (Hong Kong) Limited; **Australia**: Credit Suisse Equities (Australia) Limited; **Thailand**: Credit Suisse Securities (Thailand) Limited, regulated by the Office of the Securities and Exchange Commission, Thailand, having registered address at 990 Abdulrahim Place, 27th Floor, Unit 2701, Rama IV Road, Silom, Bangkok, Bangkok 10500, Thailand, Tel. +66 2614 6000; **Malaysia**: Credit Suisse Securities (Malaysia) Sdn Bhd; **Singapore**: Credit Suisse AG, Singapore Branch; **India**: Credit Suisse Securities (India) Private Limited (CIN no.U67120MH1996PTC104392) regulated by the Securities and Exchange Board of India as Research Analyst (registration no. INH 000001030) and as Stock Broker (registration no. INZ000248233), having registered address at 9th Floor, Ceejay House, Dr.A.B. Road, Worli, Mumbai - 18, India, T. +91-22 6777 3777; **South Korea**: Credit Suisse Securities (Europe) Limited, Seoul Branch; **Taiwan**: Credit Suisse AG Taipei Securities Branch; **Indonesia**: PT Credit Suisse Sekuritas Indonesia; **Philippines**: Credit Suisse Securities (Philippines) Inc., and elsewhere in the world by the relevant authorised affiliate of the above.

Additional Regional Disclosures

Australia: Credit Suisse Securities (Europe) Limited ("CSSEL") and Credit Suisse International ("CSI") are authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority ("FCA") and the Prudential Regulation Authority under UK laws, which differ from Australian laws. CSSEL and CSI do not hold an Australian Financial Services Licence ("AFSL") and are exempt from the requirement to hold an AFSL under the Corporations Act (Ch) 2001 ("Corporations Act") in respect of the financial services provided to Australian wholesale clients (within the meaning of section 761G of the Corporations Act) (hereinafter referred to as "Financial Services"). This material is not for distribution to retail clients and is directed exclusively at Credit Suisse's professional clients and eligible counterparties as defined by the FCA, and wholesale clients as defined under section 761G of the Corporations Act. Credit Suisse (Hong Kong) Limited ("CSHK") is licensed and regulated by the Securities and Futures Commission of Hong Kong under the laws of Hong Kong, which differ from Australian laws. CSHK does not hold an AFSL and is exempt from the requirement to hold an AFSL under the Corporations Act in respect of providing Financial Services. Investment banking services in the United States are provided by Credit Suisse Securities (USA) LLC, an affiliate of Credit Suisse Group. CSSU is regulated by the United States Securities and Exchange Commission under United States laws, which differ from Australian laws. CSSU does not hold an AFSL and is exempt from the requirement to hold an AFSL under the Corporations Act in respect of providing Financial Services. Credit Suisse Asset Management LLC (CSAM) is authorised by the Securities and Exchange Commission under US laws, which differ from Australian laws. CSAM does not hold an AFSL and is exempt from the requirement to hold an AFSL under the Corporations Act in respect of providing Financial Services. This material is provided solely to Institutional Accounts (as defined in the FINRA rules) who are Eligible Contract Participants (as defined in the US Commodity Exchange Act). Credit Suisse Equities (Australia) Limited (ABN 35 068 232 708) ("CSEAL") is an AFSL holder in Australia (AFSL 237237).

Malaysia: Research provided to residents of Malaysia is authorised by the Head of Research for Credit Suisse Securities (Malaysia) Sdn Bhd, to whom they should direct any queries on +603 2723 2020.

Singapore: This report has been prepared and issued for distribution in Singapore to institutional investors, accredited investors and expert investors (each as defined under the Financial Advisers Regulations) only, and is also distributed by Credit Suisse AG, Singapore Branch to overseas investors (as defined under the Financial Advisers Regulations). Credit Suisse AG, Singapore Branch may distribute reports produced by its foreign entities or affiliates pursuant to an arrangement under Regulation 32C of the Financial Advisers Regulations. Singapore recipients should contact Credit Suisse AG, Singapore Branch at +65-6212-2000 for matters arising from, or in connection with, this report. By virtue of your status as an institutional investor, accredited investor, expert investor or overseas investor, Credit Suisse AG, Singapore Branch is exempted from complying with certain compliance requirements under the Financial Advisers Act, Chapter 110 of Singapore (the "FAA"), the Financial Advisers Regulations and the relevant Notices and Guidelines issued thereunder, in respect of any financial advisory service which Credit Suisse AG, Singapore Branch may provide to you.

EU: This report has been produced by subsidiaries and affiliates of Credit Suisse operating under its Global Markets Division

In jurisdictions where CS is not already registered or licensed to trade in securities, transactions will only be effected in accordance with applicable securities legislation, which will vary from jurisdiction to jurisdiction and may require that the trade be made in accordance with applicable exemptions from registration or licensing requirements.

This material is issued and distributed in the U.S. by CSSU, a member of NYSE, FINRA, SIPC and the NFA, and CSSU accepts responsibility for its contents. Clients should contact analysts and execute transactions through a Credit Suisse subsidiary or affiliate in their home jurisdiction unless governing law permits otherwise.

Please note that this research was originally prepared and issued by CS for distribution to their market professional and institutional investor customers. Recipients who are not market professional or institutional investor customers of CS should seek the advice of their independent financial advisor prior to taking any investment decision based on this report or for any necessary explanation of its contents.

CS may provide various services to US municipal entities or obligated persons ("municipalities"), including suggesting individual transactions or trades and entering into such transactions. Any services CS provides to municipalities are not viewed as "advice" within the meaning of Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. CS is providing any such services and related information solely on an arm's length basis and not as an advisor or fiduciary to the municipality. In connection with the provision of the any such services, there is no agreement, direct or indirect, between any municipality (including the officials, management, employees or agents thereof) and CS for CS to provide advice to the municipality. Municipalities should consult with their financial, accounting and legal advisors regarding any such services provided by CS. In addition, CS is not acting for direct or indirect compensation to solicit the municipality on behalf of an unaffiliated broker, dealer, municipal securities dealer, municipal advisor, or investment adviser for the purpose of obtaining or retaining an engagement by the municipality for or in connection with Municipal Financial Products, the issuance of municipal securities, or of an investment adviser to provide investment advisory services to or on behalf of the municipality. If this report is being distributed by a financial institution other than Credit Suisse AG, or its affiliates, that financial institution is solely responsible for distribution. Clients of that institution should contact that institution to effect a transaction in the securities mentioned in this report or require further information. This report does not constitute investment advice by Credit Suisse to the clients of the distributing financial institution, and neither Credit Suisse AG, its affiliates, and their respective officers, directors and employees accept any liability whatsoever for any direct or consequential loss arising from their use of this report or its content. No information or communication provided herein or otherwise is intended to be, or should be construed as, a recommendation within the meaning of the US Department of Labor's final regulation defining "investment advice" for purposes of the Employee Retirement Income Security Act of 1974, as amended and Section 4975 of the Internal Revenue Code of 1986, as amended, and the information provided herein is intended to be general information, and should not be construed as, providing investment advice (impartial or otherwise).

Copyright © 2020 CREDIT SUISSE AG and/or its affiliates. All rights reserved.

When you purchase non-listed Japanese fixed income securities (Japanese government bonds, Japanese municipal bonds, Japanese government guaranteed bonds, Japanese corporate bonds) from CS as a seller, you will be requested to pay the purchase price only.