

TOP *of* MIND

CURRENCY WARS



President Trump has voiced concern that a strong Dollar is damaging US competitiveness. Of course, exchange rates do matter for trade, and the US' non-oil trade balance has deteriorated sharply since the Dollar began to climb in 2014. So it's no surprise that Trump's laser focus on the US trade deficit would end up targeting Dollar strength—and that currency would become another front in the US-China trade war. Whether the US should, could, and would begin to proactively manage the Dollar, and whether these actions—or further trade war escalation—could lead to a global “currency war” is Top of Mind. We get perspectives from the Peterson Institute's Joseph Gagnon and the Council on Foreign Relations' Brad Setser; both believe that Dollar strength and the associated US trade deficit are cause for concern, but see low odds of US FX intervention that triggers a currency war (we agree). But given that China has been managing the Yuan stronger than it otherwise would be, trade war escalation that motivates a sharp CNY depreciation could be such a trigger.

“

I worry that currency manipulation will be a problem in the next recession...That's because most advanced economies will likely be at or close to the zero bound... At the same time, expansionary fiscal policy will likely face political obstacles. So currency manipulation may be the easiest way to fight a recession... I think the US should take a more proactive role in managing the Dollar, especially to counteract foreign currency manipulation.”

- Joseph Gagnon

The complexity for the US is that the more the US intensifies the trade war, the more pressure there is for a weaker Yuan. And the challenge for the world is that if China tries to offset weak trade with the US with a weaker Yuan, that puts more pressure on other economies to depreciate their currencies in order to avoid losing out to China.

- Brad Setser

”

WHAT'S INSIDE

INTERVIEWS WITH:

Joseph Gagnon, Senior Fellow, Peterson Institute for International Economics

Brad Setser, Senior Fellow, Council on Foreign Relations

WILL THE US ADOPT A "WEAK DOLLAR" POLICY?

Alec Phillips, GS Chief US Political Economist

TRADE CONFLICTS AND THE DOLLAR

Zach Pandl, GS Co-Head of Global FX, Rates, and EM Strategy

IS CHINA REALLY A "CURRENCY MANIPULATOR"?

Andrew Tilton, GS Chief Asia Economist

CURRENCY MANIPULATOR: WHAT'S IN A NAME?

Michael Cahill, Senior FX Strategist

...AND MORE

Allison Nathan | allison.nathan@gs.com

David Groman | david.groman@gs.com

Investors should consider this report as only a single factor in making their investment decision. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to www.gs.com/research/hedge.html.

Macro news and views

We provide a brief snapshot on the most important economies for the global markets

US

Latest GS proprietary datapoints/major changes in views

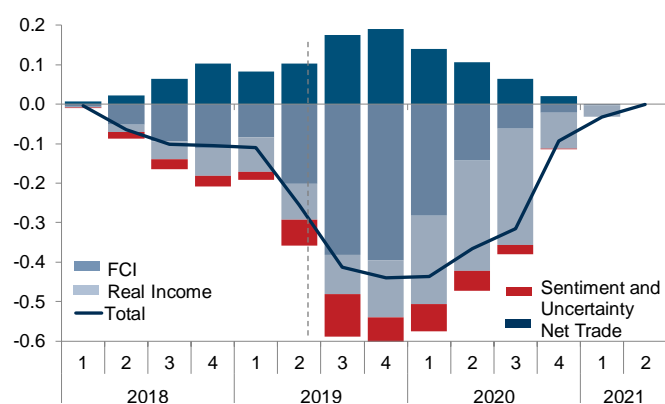
- We now think the US will raise existing tariffs rates on Chinese goods in October and implement additional tariffs in December, with an expected cumulative hit of 0.7% to the level of US GDP by 2021.

Datapoints/trends we're focused on

- Fed communication heading into the September and October FOMC, where we expect two 25bp cuts.
- A likely sharp uptick in core PCE inflation in late 2019/early 2020 as the latest tariffs start to have an impact on prices, which we think will make the environment less supportive of further rate cuts.

A bigger hit to growth

Effect of the trade war on real US GDP growth, pp



Source: Goldman Sachs Global Investment Research.

Japan

Latest GS proprietary datapoints/major changes in views

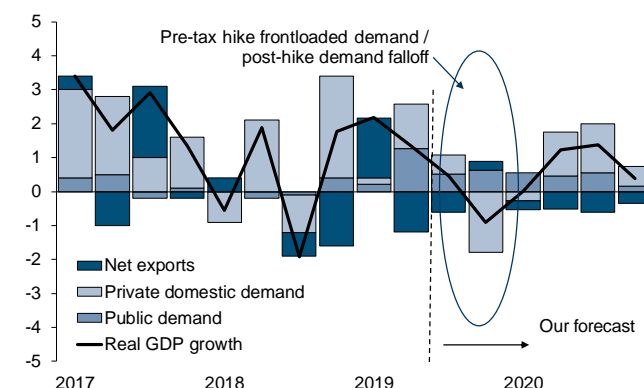
- No major changes in views.

Datapoints/trends we're focused on

- A possible extension of BOJ forward guidance in October; though we don't see the BOJ taking rates more negative unless USD/JPY continues to appreciate at least beyond 100.
- Likely rush demand ahead of a consumption tax hike in October.
- Japan's Consumer Confidence Index, which fell for the eleventh straight month in August to its lowest level since April 2014.

A temporary boost

Contributors to qoq (ann) GDP growth, %



Source: Cabinet Office, Goldman Sachs Global Investment Research.

Europe

Latest GS proprietary datapoints/major changes in views

- We've raised our odds of a Brexit deal before the October 31 deadline to 55% after Parliament rejected holding a general election until Brexit is resolved.
- We reduced our Euro area growth forecast to 0.5% in H2 2019 (from 1%), and now expect Germany to enter a technical recession.

Datapoints/trends we're focused on

- The ECB's September easing package, which included a 10bp deposit rate cut, a re-start of QE, and changes to forward guidance among other measures.

Growth continues to slow

Euro area Current Activity Indicator, %



Source: Goldman Sachs Global Investment Research.

Emerging Markets (EM)

Latest GS proprietary datapoints/major changes in views

- We lowered our China growth forecast to 5.6% and 5.8% (qoq annualized) in Q3 and Q4 of 2019, but expect it to then pick up slightly in H1 2020.
- We shifted our USD/CNY forecast weaker to 7.2/7.2/7.1 over 3/6/12 month horizons, respectively.

Datapoints/trends we're focused on

- Policy easing in China after a September State Council meeting that sent strong loosening signals.
- Deterioration in conditions in Argentina after a large primary deficit for President Macri; we expect a contraction of -3.2% in 2019 and -1.6% in 2020, though uncertainty remains.

China leaning easier

China domestic macro policy proxy, z-score



Source: CEIC, Haver Analytics, Goldman Sachs Global Investment Research.

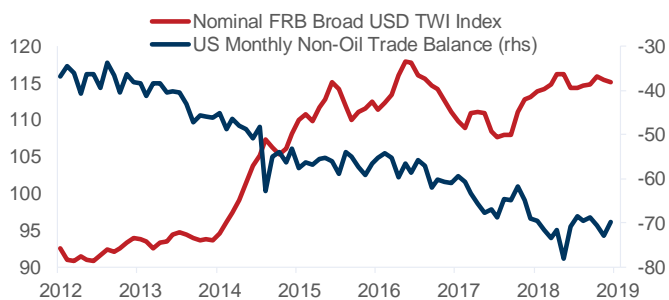
Currency wars

Amid continued US Dollar strength, President Trump has voiced increasing concern that a strong currency is damaging US competitiveness (see pg. 10.) This marks a notable break from the past; since the mid-90s, administrations have typically endorsed the importance of a "strong Dollar"—that reflects the strength of the US economy and appeal of US assets—above all else.

Of course, exchange rates do matter for trade, and the US' non-oil trade balance has deteriorated sharply since the Dollar began its recent climb in 2014. So it's no surprise that Trump's laser focus on the US trade deficit would end up targeting Dollar strength—and that currency would become another front in the ongoing [US-China trade war](#). Indeed, the opening shots have arguably already been fired: The US officially designated China a "currency manipulator"—a label last used in 1994—as China allowed the Yuan to depreciate to the lowest level against the Dollar in over a decade. Given these developments, whether the US government should, could, and would begin to more proactively manage the Dollar—via FX intervention, etc.—and whether these actions (or further trade war escalation) could lead to a global "currency war" is Top of Mind.

Stronger Dollar, larger deficit

Nom. FRB broad USD TWI (Jan '06=100); US non-oil trade balance, \$bn (rhs)



Source: FRB, Haver Analytics, Goldman Sachs Global Investment Research.

We first sit down with Joseph Gagnon, Senior Fellow at the Peterson Institute for International Economics and former Fed official, who has written extensively about currency conflict. He argues that, despite the US' recent designation, China does not meet even the Treasury's own criteria for a "manipulator" today (see GS Senior FX strategist Michael Cahill's take on pg. 14.) In fact, he finds that currency manipulation globally has declined sharply since the "decade of manipulation" from 2003-13 when foreign governments' purchases of foreign currency soared to unprecedented levels in an effort to boost their competitiveness.

That said, Gagnon still worries about the economic effects of the US' large trade deficit, and the extent to which future currency manipulation could exacerbate them—especially as FX policy will likely be a tempting response in the next recession given limits on monetary and fiscal policy. He therefore thinks the US should proactively fight against Dollar strength. But he recognizes the US' likely tools in fighting a currency war—direct FX intervention or taxing foreign investors—have political and/or practical drawbacks that make them unlikely anytime soon. And he thinks that's maybe just as well; the US is already being seen globally as too aggressive, and its unusual fiscal expansion—at a time when the US economy is already strong—makes the US somewhat culpable for its current strong Dollar predicament. In short: he argues the US should try to get its fiscal house in order at the same time that it looks to currency policy to solve its trade imbalance. (Note: We think a tax on foreign investment is unlikely to occur as it would probably sharply curtail foreign demand for

US Treasuries and could raise the cost of financing large deficits, as well as depress asset values in general.)

Brad Setser, Senior Fellow at the Council on Foreign Relations and former Treasury official, agrees that the Dollar is broadly overvalued today against most currencies; after all, the Dollar's positive returns and relative safety have been a compelling combination for fund managers. And he also agrees that the US is not well-positioned institutionally to combat Dollar strength. But, in contrast to Gagnon, he thinks that, in a world in which some of the US' largest trading partners are maintaining fiscal surpluses alongside negative rates, the bigger problem is too tight fiscal positions elsewhere rather than a too loose one in the US. In short: he argues that more fiscal stimulus elsewhere would be a constructive way to address strong Dollar concerns.

GS Chief US Political Economist Alec Phillips then looks at the extent to which moving away from a "strong Dollar" policy really marks a break from the past, arguing that the policy died years ago, even if the rhetoric took longer to follow. That said, he agrees that direct US FX intervention is unlikely, even if risks of it have risen. One reason for this: President Trump appears more focused on using monetary policy (i.e., pressuring the Fed to ease) than direct intervention to weaken the Dollar.

Zach Pandl, GS co-head of Global Foreign Exchange, Interest Rates and Emerging Markets Strategy Research, also finds that the Administration's inclination toward a weaker Dollar in the context of an ongoing trade conflict isn't unusual relative to recent history: The three prior periods of significant US trade conflict were all preceded by an overvalued Dollar and loss of competitiveness, and resolving them entailed Dollar depreciation. Historically, Pandl says, this depreciation resulted primarily from negotiated agreements. But even with no major policy changes this time around as we expect, he thinks market forces alone are likely to eventually bring about a weaker Dollar, which should help improve US competitiveness, limit the US trade deficit, and ultimately ease trade tensions.

In the meantime, Setser, as well as Andrew Tilton, GS Chief Asia Economist, explains that while China does not "manipulate" its currency today, it does manage it. But this management is actually helping the US because China has largely leaned against Yuan depreciation in recent years; without these actions, the Yuan would very likely be weaker and the US' trade deficit larger.

For this reason, Setser argues it wouldn't take much to see a sharp depreciation in the Yuan—substantially larger than what we've seen to date—should China decide to stop managing its currency in response to the trade war. In Setser's view, this may be the most likely way to end up in a currency war today. As he sees it: the more the US escalates the trade war, the greater the pressure on the Yuan; and the more that China responds to that pressure, the greater the likelihood of a currency war as the rest of the world is forced to respond to avoid losing out to China. Stay tuned...and also tune into the podcast version of this and other recent GS Top of Mind reports—on [Apple](#) and [Spotify](#).

Allison Nathan, Editor

Email: allison.nathan@gs.com

Tel: 212-357-7504

Goldman Sachs and Co. LLC



Interview with Joseph Gagnon

Joseph Gagnon is Senior Fellow at the Peterson Institute for International Economics and coauthor of *Currency Conflict and Trade Policy: A New Strategy for the United States (2017)*. Previously, he was Visiting Associate Director at the US Federal Reserve Board's Division of Monetary Affairs (2008-09) and Associate Director at the Fed's Division of International Finance (1999-08). Below, he argues that the US should be more proactive in managing the Dollar, but US government action to weaken the Dollar is unlikely anytime soon.

The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs.



Allison Nathan: In your recent book, you and Fred Bergsten called 2003-13 a "decade of currency manipulation." Why is that and what were the implications?

Joseph Gagnon: We called it that because, in an attempt to boost their countries' competitiveness, foreign governments engaged in an unheard

of level of foreign currency purchases—much higher than anything we had seen before, even relative to the size of world GDP. We estimate that excessive purchases—the amount above what would be reasonable for countries—averaged more than \$500bn per year during that period, and total purchases of all currencies by foreign governments averaged an unprecedented \$1trn per year. This massive intervention led to meaningful global imbalances in the form of trade surpluses in these countries that were problematic in many ways. But, especially in the context of the Great Recession, the currency manipulation substantially contributed to US job losses and the unusually slow recovery in the US economy, to the extent that a stronger Dollar weighed on US exports. Of course, many factors contributed to the depth of the recession and the drawn-out recovery that ensued, but the US clearly would have been better off without so much manipulation that strengthened the Dollar.

Allison Nathan: The US recently designated China a "currency manipulator." So is manipulation still an issue?

Joseph Gagnon: It remains somewhat of an issue, but not nearly as much as in the past. Starting in 2014, government purchases of foreign currencies declined significantly as the global economic recovery gained more solid footing and as the Dollar strengthened on the outperformance of US growth and the resulting tightening of US monetary policy; with market forces already weakening their currencies against the Dollar, foreign governments have felt less need to intervene. This shift has been reinforced by a growing realization about the drawbacks of excessive currency purchases; in recent years, the G7 and G20 have both officially agreed to refrain from targeting their exchange rates for competitive purposes.

So where does that leave us? Most recently for 2018, I estimate that excessive currency purchases were only about \$100bn—not zero, but well below the levels during the decade of manipulation. And the three countries that engaged in this manipulation on my calculations were Singapore, Macau and Norway—not China. China has not bought Dollars or foreign currency in general for several years now, and its trade surplus

is quite small. So the US Treasury declared China a currency manipulator even though it doesn't meet Treasury's own criteria for one, which I think is a mistake. But it doesn't really matter because the designation has effectively no impact.

Allison Nathan: So are the days of substantial currency manipulation by foreign governments behind us?

Joseph Gagnon: Just because manipulation is a smaller concern today doesn't mean it will stay that way. I worry that it will be a problem in the next recession, and maybe even a bigger one than in the last recession. That's because most advanced economies will likely be at or close to the zero bound, which means the ability for monetary policy to respond to a downturn will be limited. At the same time, expansionary fiscal policy will likely face political obstacles. So currency manipulation may be the easiest way to fight a recession.

Such a resurgence in manipulation would be problematic not only due to the cyclical implications—the extent to which a resulting stronger Dollar would again impede the US' recovery—but also due to the implications for the US' large and growing net debt to the rest of the world. The Dollar's reserve role drives some of this debt, but currency manipulation compounds it greatly. Today, US net debt—strictly speaking, its net international investment position—is about 50% of GDP and rising slowly. If the US could get back to balanced trade, this net debt stock would gradually shrink in relation to GDP to more manageable levels. But as long as the current account deficit exceeds 2 percent of GDP, the net debt will continue to grow as a share of GDP, which is not healthy or sustainable in the long run. No country has sustainably managed a net debt much larger than 60% of GDP. So I worry about the potential return of sizable currency manipulation and its implications for the health of the US economy.

Allison Nathan: Today, there seems to be increasing discussion about the US initiating a currency war against the rest of the world—and/or against China in particular as an extension of the trade war—to weaken the Dollar. How could the US fire the first shot in a currency war?

Joseph Gagnon: To start, there's no good definition of a "currency war." The term was prominently used by the Brazilian finance minister nearly 10 years ago to attack QE in the US. I think that usage was very misguided; while easing monetary policy does weaken currencies, it has beneficial effects, even on foreign countries. For example, if the US eases monetary policy, we get a weaker Dollar; but we also get lower interest rates, easier borrowing conditions, and more spending—all of which helps suck in more imports, which offsets the export effect from the exchange rate. So, these

types of actions shouldn't be criticized, or even be considered a "currency war." A problematic currency war occurs when you borrow in your own currency and buy foreign currencies to move the exchange rate without easing monetary or fiscal policy. That's just a zero-sum policy; whatever you gain from exports, the other country loses without any offsetting benefit.

So, how could the US initiate a currency war to weaken the Dollar? Traditionally, countries have fought currency wars by intervening directly in the FX market—basically, buying US Dollars and investing them in US Treasuries. So the US could engage in its own direct intervention by buying a foreign currency, such as the Yuan, and investing that in Chinese government bonds. Another option would be to tax foreign investors. This type of tax would push the Dollar down without having to buy foreign currencies—and there's actually a bill in the Senate filed this year by Tammy Baldwin (D-WI) and Josh Hawley (R-MO) to do just that.

Allison Nathan: What's the likelihood that the US engages in direct FX intervention this year?

Joseph Gagnon: It's possible, but I have a hard time seeing the chances of intervention anytime soon as higher than 20% or 30% for two main reasons. First, there's a political issue: Americans might think it's a bit odd that the US is fighting a "war" by lending money to China. Buying other foreign currencies instead might be slightly more politically palatable, but still likely difficult to explain. Second, there are practical issues: Dollar markets are deep and liquid, and the US Treasury doesn't have nearly enough resources to intervene successfully at present. This means either Congress would have to pass legislation that gives Treasury more borrowing authority—which seems unlikely in these polarized times—or the Federal Reserve would have to get involved.

Historically, the Fed has typically cooperated with Treasury 50-50 on intervention measures despite the fact that Dollar policy is Treasury's purview. But even if the Fed were to follow the same pattern today, the amount of resources needed to move the Dollar would likely require it to lend Treasury some additional cash secured by the assets it buys, which, at least in principle, would be an almost unlimited line of credit. That's possible, but my sense is that the Fed does not want to be involved. Of course, it could feel compelled to cooperate even if it doesn't want to. For example, if the Treasury makes a formal request backed by the Trump Administration for a loan to do unlimited FX intervention, the Fed would likely find it awkward to say no. After all, the Fed would not be taking any risk on its own account; Treasury would need to deal with any losses on its FX holdings. And this cooperation would not interfere with the Fed's ability to pursue its dual employment and inflation mandate; in fact, the Fed could neutralize the impact of Dollar depreciation through rate hikes if it felt that was necessary to deliver on its mandate. But given these multiple political and practical hurdles, it's difficult to see high odds of intervention.

Allison Nathan: What about the likelihood of a tax on foreign investors that you mentioned?

Joseph Gagnon: It seems to me that a tax on foreign investors designed to weaken the Dollar might be an easier sell

to the public. People are more likely to understand why a tax might be a tool in a "war," just like a tariff. And there's perhaps even a cleaner case that foreign investors will indeed bear the brunt of this tax, whereas there is an active debate about whether American consumers ultimately pay for tariffs. That said, if the tax does indeed weaken the Dollar—which is the point, of course—it will make US imports more expensive, and that will ultimately hurt American consumers even as it helps American producers. Wall Street would surely be opposed; US financial companies who do a lot of business with foreigners would not want themselves or their clients to have to pay such a tax. But this means the policy could be cast as Main Street versus Wall Street, which might garner some political support.

Beyond the politics, it is not clear how high the tax would need to be to have the intended effect of balancing trade. A similar tax employed in Brazil reached 7% at its peak and there were still debates about whether it was effective. A sufficiently high tax might dramatically reduce the Dollar's international role, at some cost to the United States. But this may be the necessary price to put the US net investment position on a sustainable path. And the revenues would at least reduce our fiscal deficit. Given all of these considerations, I don't think it's likely that the current Senate bill or something similar passes anytime soon.

Allison Nathan: Does more proactive currency action make sense today?

Joseph Gagnon: I think the US should take a more proactive role in managing the Dollar, especially to counteract foreign currency manipulation. Whether emerging market and/or smaller countries should be included in these efforts is debatable. But I am generally in favor of Congress passing some type of legislation that seeks to narrow trade imbalances. That said, I think the timing is horrible to start these types of policies now, for two reasons. One is that the United States is already doing all kinds of aggressive things—some of which are not justified, in my view, such as tariffs that are very likely violating WTO rules. In this context, taking another action that would be seen as aggressive—even if it is justified—would reinforce a negative perception of the US around the world.

The second reason that this is an unfortunate moment to begin proactive currency policy is that the US just launched a massive fiscal expansion—despite the fact that the US has the largest budget deficit as a share of GDP of the major economies and the US economy is booming, at least relative to most other economies. As a result, the US is sucking in more imports, worsening its trade deficit, and pushing the Dollar up to the extent that the fiscal stimulus has led the Fed to tighten policy more than it otherwise would have. I estimate the Dollar is overvalued today by roughly 20%, with maybe half of that owing to our fiscal policy that's out of step with the rest of the world, and the other half due to safe haven/reserve currency purchases and some lingering manipulation. So, a big chunk of the US' current predicament has been caused by our own policies, which don't make sense. I therefore think it's important that we at least tackle—if not fix—our fiscal position at the same time that we pursue more proactive currency management. But that seems unlikely under the current administration.

Will the US adopt a "weak Dollar" policy?

Alec Phillips answers key questions on the status of the US "strong Dollar" policy and odds and mechanics of US FX intervention

Q: Is the "strong Dollar" policy dead?

A: The policy arguably died years ago but the rhetoric has taken longer to follow. The strong Dollar policy was born out of a desire to ensure demand for US assets—particularly Treasuries—in the mid-1990s at a time when Treasury yields had risen and the Dollar had weakened. Since then, Treasury Secretaries have taken care to endorse this principle, or at least not to publicly contradict it. That said, while recent administrations did not take explicit action to weaken the Dollar, it has been some time since the Treasury actively tried to strengthen it.

Q: Does that mean the US will actively intervene to weaken the Dollar?

A: We do not believe direct intervention is the base case, but the odds have risen. President Trump has made his position clear on several occasions (see pg. 7). His comments are notable in that they clearly contravene the "strong Dollar" policy in general, but also call out specific trading partners. It is also notable that he has tied his Dollar comments to the Federal Reserve on multiple occasions. While the Fed would act as agent to carry out any intervention on behalf of the Treasury, his comments suggest that he has monetary policy in mind more than direct purchases of foreign assets. If so, his focus might not be direct intervention using the Treasury's authority, but instead a more general complaint regarding the effect that the Fed's monetary policy has had on the Dollar.

Q: How would FX intervention work?

A: The Treasury would purchase foreign assets using its Exchange Stabilization Fund (ESF). Congress established the ESF in 1934 to stabilize foreign exchange markets. The Treasury has substantial flexibility in how it uses the assets it holds, which total \$93.5bn. Of this, the Treasury has roughly \$68bn in capacity (\$23bn in Treasury securities and \$45bn in Special Drawing Rights it could monetize) to make additional foreign currency purchases. The ESF already holds German, French, Dutch, and Japanese government securities, as well as cash deposits with the German, French and Japanese central banks.

Q: What is the Fed's role in this?

A: The Fed would act as the agent of the Treasury but might make purchases on its own behalf as well. As in other areas of activity, the Fed serves as the Treasury's fiscal agent and, at a minimum, carries out FX transactions on the Treasury's behalf. However, the Fed has in the past also provided the Treasury with additional resources for FX

intervention, in two ways. First, during prior periods of regular intervention in FX markets, the Fed has made purchases alongside the Treasury for its own account of equal size to the Treasury's activities. Thus, at the moment the Fed holds an equal amount of assets as does the Treasury. Second, and slightly more controversially, the Fed has in the past provided warehousing capacity to the Treasury, through which the Fed would temporarily acquire foreign assets from the Treasury's account in return for Dollars, which the Treasury could then use to purchase additional foreign assets. The Fed last engaged in such activity in 1992 and currently places an aggregate limit of \$5bn on such transactions (down from a \$20bn limit at its peak capacity). Overall, this suggests that the Treasury and Fed's maximum combined FX intervention capacity stands at roughly \$145bn.¹

Q: Would the Fed participate alongside the Treasury?

A: Probably, but it would likely depend on the circumstances. FX intervention hasn't happened regularly since 1995. Around the same time that the Treasury began to discuss an explicit strong Dollar policy, the Treasury stopped intervening frequently in FX markets, with only 3 idiosyncratic exceptions since then (1998, 2000, and 2011). The Fed might be wary of restarting an active FX intervention policy with the Treasury, as it is unclear whether sterilized intervention is effective on its own, apart from the signaling effect regarding the potential stance of monetary policy. Relatedly, to the extent that intervention is effective mainly as a signaling mechanism, engaging in such transactions at the behest of the Treasury raises [questions regarding Fed independence](#), which has already come under closer scrutiny recently. That said, since the Treasury has a finite amount of capacity to intervene, it is more likely that the Fed would follow the Treasury's lead and participate alongside it in FX intervention.

Q: What else can President Trump actually do to weaken the Dollar?

A: The most effective strategy might be to reduce tariffs. The financial market response to increases in trade friction move in both directions. The Dollar typically strengthens during periods of elevated trade uncertainty as the risk-off nature of such events typically leads to Dollar appreciation and tariffs have imposed greater damage on non-US growth than US growth. That said, it also seems clear that trade-related uncertainty has been a substantial factor behind the Fed's shift to an easier policy stance, which has restrained Dollar appreciation. Taken together, this suggests that if the President wanted a weaker Dollar he could announce a trade agreement with China, but might also have to accept slightly tighter monetary policy in return.

Alec Phillips, Chief US Political Economist

Email: alec.phillips@gs.com
Tel: 202-637-3746

Goldman Sachs and Co. LLC

¹ This assumes that the Treasury uses the full \$67.5bn in the ESF that is not already invested in foreign assets (\$67.5bn) and that the Fed would match the Treasury's purchases in equal amount, for a total of \$135bn. This further assumes that the Treasury would warehouse the maximum \$5bn in foreign assets with the Fed, using the proceeds to purchase another

\$5bn in foreign assets, which the Fed once again matches in its own account, raising the total by another \$10bn to \$145bn. The maximum amount might be somewhat lower if, for example, the Fed required the Treasury's ESF to use some of its resources to guarantee the Fed's balance sheet against potential losses due to an appreciation of the Dollar.

Trump on the Dollar

TRUMP



January 16, 2017: "Our companies can't compete with [China] now because *our currency is too strong*. And it's killing us."

April 12, 2017: "I think our *Dollar is getting too strong*, and partially that's my fault because people have confidence in me. But that's hurting—that will hurt ultimately."

July 25, 2017: "I think low interest rates are good. I like a *Dollar that's not too strong*. I mean, I've seen *strong Dollars*. And frankly, other than the fact that it sounds good, lots of bad things happen with a strong Dollar."

MNUCHIN



January 24, 2018: "Obviously a *weaker Dollar* is good for us as it relates to trade and opportunities," though the currency's short term value is "not a concern of ours at all... Longer term, the *strength of the Dollar* is a reflection of the strength of the U.S. economy and the fact that it is and will continue to be the primary currency in terms of the reserve currency."

TRUMP



August 30, 2018: "As president, there's something really nice-sounding about the fact that *our Dollar is so strong and so powerful*. The bad news is that it makes life more difficult when you're looking to sell product to the rest of the world. And they are cutting their currencies very substantially, far more than they should be allowed to do. And we're not being accommodated. I don't like that."

March 2, 2019: "I want a *strong Dollar*, but I want a dollar that's going to be great for our country, not a *Dollar that's so strong* that it is prohibitive for us to be dealing with other nations and taking their business."

July 3, 2019: "China and Europe playing *big currency manipulation game* and pumping money into their system in order to compete with USA. We should MATCH..."

MNUCHIN



July 18, 2019: "[Changing the US dollar policy] is something we could consider in the future but as of now *there's no change to the Dollar policy*."

TRUMP



July 26, 2019: "I didn't say I'm not going to do something [on the *Dollar*]."

August 5, 2019: "China dropped the price of their currency to an almost historic low. It's called *'currency manipulation'*. Are you listening Federal Reserve?"

August 8, 2019: "As your President, one would think that I would be thrilled with our *very strong Dollar*. I am not! The Fed's high interest rate level, in comparison to other countries, is keeping the Dollar high, making it more difficult for our great manufacturers."

August 23, 2019: "Germany competes with the USA. Our Federal Reserve does not allow us to do what we must do. They put us at a *disadvantage against our competition*. *Strong Dollar, No Inflation!* They move like quicksand. Fight or go home!"

MNUCHIN



August 28, 2019: The Treasury Department has "*no intention of intervention at this time*. Situations could change in the future but right now we are not contemplating an intervention."

TRUMP



August 30, 2019: "The Euro is dropping against the Dollar 'like crazy,' giving them a big export and manufacturing advantage...and the Fed does NOTHING! *Our Dollar is now the strongest in history*. Sounds good, doesn't it? Except to those (manufacturers) that make product for sale outside the U.S."

Sources: Various news sources, compiled by Goldman Sachs Global Investment Research.

Interview with Brad Setser

Brad Setser is a Senior Fellow at the Council on Foreign Relations and a Senior Advisor at Exante Data. He served as the Deputy Assistant Secretary for International Economic Analysis at the US Treasury (2011-15), and Director for International Economics on the NEC and NSC (2009-11). Below, he argues that trade war escalation will further pressure the CNY, and raise the risk of a currency war.

The views stated herein are those of the interviewee and do not necessarily reflect those of Goldman Sachs.



Allison Nathan: Does China manipulate its currency today?

Brad Setser: No. I define manipulation as sustained purchases of FX to hold a currency down and maintain a large trade surplus. In my judgment, China no longer meets this definition. But it does manage its currency in several ways to keep the Yuan within a range

that Chinese authorities are comfortable with. First, China signals where it wants the Yuan to go by setting its daily "fix," which is a central point around which the CNY can trade. The "fix" is usually set by a formula; but there's scope for the PBOC to deviate from that formula—and the way it deviates constitutes a signal that helps guide the market. The PBOC also directly intervenes in the markets, though less so than in the past. For example, it sold Dollars and bought Yuan for a couple of months last fall. Finally, state banks sometimes intervene in the market, likely on behalf of the PBOC. Of course, authorities use these tools against the backdrop of capital controls, which limit the ability of Chinese residents to exchange Yuan for the Dollar. Limiting demand for Dollars reduces the pressure on China's reserves and makes the job of managing its currency on a day-to-day basis easier.

Allison Nathan: Does the US decision to designate China a currency manipulator have any teeth?

Brad Setser: Designating China as a currency manipulator under the 1988 trade law literally has no teeth. The sanction is a negotiation, and the US and China are obviously already engaged in negotiations. China doesn't meet the criteria for designation under the 2015 law, and the sanctions in that law are so mild in any case that they are essentially irrelevant in the current context in which the US has introduced very substantial tariffs on almost all Chinese goods. So the only penalty the US action brings is basically public naming and shaming. Can that have an impact? We'll see. So far it hasn't seemed to lead to any material shift in China's currency management.

Allison Nathan: Is it in the US' economic interest for China to stop managing its exchange rate?

Brad Setser: Currency is an important issue; the level of the Yuan against the Dollar matters for bilateral and global trade. With the Yuan now as weak as it was in 2008, it's difficult to get more balance into the US-China trading relationship. More broadly, the Dollar has been fairly strong not just against the Yuan, but against most currencies for nearly five years now, and US exports haven't done very well over that period. That has implications for the relative strength of the US economy, and especially for politically key parts of the country, such as the upper Midwest. So I believe there is real reason to be

concerned about the impact of sustained Dollar strength on the US manufacturing sector.

But the irony for the US is that right now—when the US has introduced significant tariffs on Chinese imports and the Chinese economy is relatively weak—the US actually *needs* China to continue managing its currency. That's because—in contrast to the 2003-13 period when China was holding the Yuan down—China has, broadly speaking, been managing its currency to keep it *stronger* than otherwise would be the case, which is actually helping the US. Without China's currency management we would have a weaker Yuan and, all else equal, a bigger US trade deficit. And the more tariffs the US puts on China, the more this will likely be the case.

Allison Nathan: So is the Yuan actually overvalued?

Brad Setser: That's a difficult question. I would actually say the Yuan is fairly valued against most currencies, and slightly too weak versus the Dollar. Let me explain: Of course, if China removed capital controls, the value of the Yuan that would balance its financial account—the desire of Chinese savers to hold foreign assets relative to the desire of foreign investors to hold Chinese assets—would likely be weaker than current levels. But this looks fairly unlikely for now. And looking instead at trade flows, the Yuan seems properly valued against most currencies. Chinese exports moved in line with—albeit weak—global exports in 2018, despite US tariffs. And Chinese export volumes seem set to slightly outpace global trade this year.

The picture is a little different if you look specifically at the Yuan's value versus the Dollar. Right now, I think the Dollar is too strong against most currencies, including the Yuan. This has left the USD/CNY back at levels we saw 10 years ago despite the fact that the Chinese economy is more productive than it was then. But ultimately, I don't think the Dollar's relative strength against the Yuan is out of line with the Dollar's broader overvaluation against a range of currencies.

Allison Nathan: How likely is it that the US intervenes in the FX market to counter Dollar strength?

Brad Setser: I currently don't see US FX intervention as likely. It's quite clear that the Trump Administration is willing to consider a broad range of policy tools to bring down the trade deficit, and intervention is one of them. In this context, it's important to note that the discussion around intervention in the US today is very different than in the past couple of decades. In the decade prior to 2014, the main concern was that other, mostly emerging market, countries were intervening to keep their currencies down against the Dollar, as I mentioned in the context of China. So FX policies elsewhere were a primary driver of Dollar strength, and US efforts around intervention were focused on convincing the rest of the world to intervene less in order to help bring the US deficit down.

Since 2014, the main source of Dollar strength has been the higher yield of US bonds relative to other advanced economies as the Fed embarked on a hiking cycle, which led to private inflows that drove and sustained US trade deficits. So the discussion today is whether the US should act like the emerging markets of the past and actively intervene to push the Dollar down, which would mark a somewhat radical policy shift, at least relative to recent history.

But the challenge goes beyond such a policy shift; institutionally, the US is not set up to intervene effectively in FX markets. The Treasury's modest pool of foreign exchange reserves is too small to fund the substantial amount of intervention that would be required to meaningfully move the Dollar. The Fed could provide another source of firepower, but the Fed's mandate is to target domestic conditions—not the exchange rate. And while it's possible that the US could try to coordinate with other countries, I don't think that's likely today given that many of the US' major trading partners are worried about their own economies and don't want a stronger currency.

Allison Nathan: Could all of this lead to a currency war, assuming we're not already in one?

Brad Setser: One definition of a "currency war" is a situation in which countries with relatively high interest rates are punished with strong currencies, which ultimately compels them to ease; in the end, everybody ends up easing and relative currency values don't change much. Even though we're seeing very low interest rates globally today, I don't think that's indicative of a currency war, but rather a reflection of weak growth and lots of global funds looking for yield.

I think escalation into a more distinct and troubling kind of "currency war," would require FX becoming a major part of the ongoing trade war. For example, in response to US trade war escalation, China could let its currency depreciate sharply rather than simply test the edges of its typical trading band. This would likely prompt substantial FX depreciation across much of Asia, potentially motivate Japanese authorities to intervene directly in FX markets to combat Yen appreciation pressures, and compel European officials to, at a minimum, take additional easing measures. Should this confluence of events lead the US to engage in direct FX intervention against the Yuan or other currencies—or potentially further escalate the trade war—we could end up in a new form of escalatory spiral. I don't think that's likely, but it's a risk. The complexity for the US is that the more the US intensifies the trade war, the more pressure there is for a weaker Yuan. And the challenge for the world is that if China tries to offset weak trade with the US with a weaker Yuan, that puts more pressure on other economies to depreciate their currencies in order to avoid losing out to China.

Allison Nathan: What do you think would compel China to pursue a major depreciation?

Brad Setser: The reality is that China could simply decide that in the face of ever-rising US tariffs, it wants a substantially weaker Yuan. Given that China has been actively managing its currency stronger, I don't think it would take much to achieve a sharp depreciation. But factors that could further compel China to move in this direction would likely include a deterioration in China's broader export performance. China's overall exports to

third-party markets are still up versus a year ago, and China's overall trade surplus is rising. But future signs that the trade war with the US is impeding China's exports elsewhere would likely be a reason to pursue a weaker Yuan. The other thing to watch for is evidence that China is losing control over its financial account; if outflow pressures force China to sell substantial reserves to hold the line on the currency, China's authorities may decide that these efforts aren't worth it.

Allison Nathan: Could a currency war trigger diversification away from the Dollar in China and more globally?

Brad Setser: China could sell Dollars—as well as US Treasuries—in response to the current conflict. But the question is, what would they shift into instead? They could try to buy Euros or Yen. But it is almost impossible to find any market that could actually accommodate a large part of China's portfolio, and also provide China with a positive yield. The common refrain is that people are holding the Dollar because it's a safe-haven asset. But the Dollar also has the highest yield of the major reserve currencies, so diversification out of it right now would come at a substantial financial cost.

That said, some countries, such as Russia, have already diversified away from the Dollar, shifting mainly into the Euro and the Yuan last year; and it is certainly possible that something similar could happen more broadly. In particular, given negative yields in much of the advanced world, many reserve managers have already begun looking to the Yuan as a positive-yielding alternative to the Dollar. So the Yuan is increasingly a small, but established part of many reserve managers' currency baskets.

I think the Trump Administration should welcome this kind of diversification into the Yuan and other currencies given its concern about the strong Dollar today. But I'd note that even with this diversification, it's difficult to see any currency rivaling the Dollar as a reserve asset. In particular, the internationalization of the Yuan has been a slow process, and China's currency is still a long way away from being a fully convertible and truly international currency. That doesn't bother me; premature internationalization of the Yuan before China is ready could inadvertently trigger a major depreciation of the currency, which would deliver a nasty shock to markets and economies globally, as we've discussed.

Allison Nathan: Is there a more constructive way to address some of the global imbalances that have helped give rise to the current conflicts?

Brad Setser: I think more attention needs to be paid to the gaps between the US' fiscal stance versus some of its key trading partners' stances. Given the very low rates in much of the world, it's hard to make the case that the US' loose fiscal policy alone is causing the large trade deficit. Countries that run fiscal surpluses in a negative rate world—such as Germany, the Netherlands, Sweden, and Korea—are effectively forcing global funds out of their bond market and into the Dollar, which adds to Dollar strength. And they're also adding to the pressures that are pulling US and global rates down. More fiscal expansion among the US' trading partners consequently would be a constructive response to President Trump's concerns about Dollar strength.

Trade conflicts and the Dollar

Zach Pandl argues that Dollar depreciation helped resolve major trade conflicts in the past, and probably will again

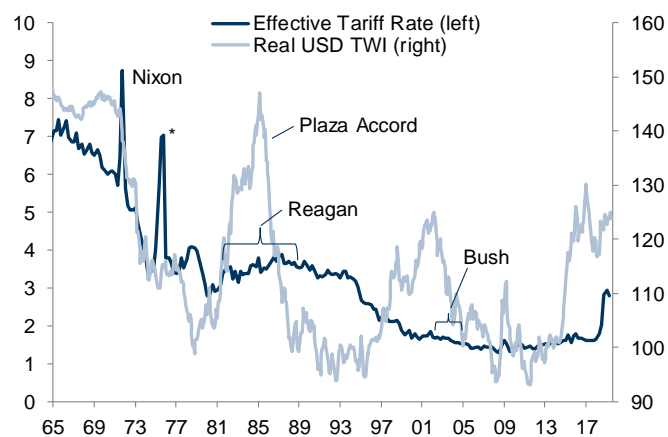
Major trade conflicts are relatively rare, but the current dispute between the US and China is not unprecedented. A number of prior US Administrations have used protectionism (or threats of it) to achieve trade policy goals, often with significant implications for currency markets. These episodes help shape our view of a weaker US Dollar over the medium term.

Modern US trade conflicts

There have been three prior periods of significant trade conflict in modern US history. From August to December 1971, President Nixon imposed a 10% surcharge on all US imports (and ended the convertibility of Dollars into gold) in an effort to compel Japan and several Western European nations to revalue their exchange rates and help weaken the Dollar. In the mid-1980s, the Reagan Administration used tariffs and a variety of other measures—mostly aimed at Japan—in an attempt to combat the strong Dollar and widening trade deficit. And during 2004-06, the Bush Administration and members of Congress from both parties complained about an undervalued Yuan and threatened to impose significant new tariffs on China.²

Conflict up, Dollar down

US effective tariff rate (Customs Duties/Imports), %; Real USD TWI (rhs), index



*Ford Administration oil import fees.

Source: BEA, BIS, Haver Analytics, Goldman Sachs Global Investment Research.

These examples share several common features. First, while political developments undoubtedly played a role, the US actions ultimately grew out of underlying macroeconomic pressures—namely, an overvalued Dollar and the resulting loss of trade competitiveness. In each case, protectionism was preceded by an elevated exchange rate and deterioration in the balance of payments (a wider trade deficit and/or loss of gold reserves), and arguably would have happened eventually, regardless of the personnel at the White House or Treasury.

Second, Dollar weakness eventually helped to stabilize the US trade balance and ease trade conflicts. Picking the start date for

measuring past instances of Dollar depreciation is somewhat arbitrary, but based on the move in our real trade-weighted index, the currency dropped sharply over the three years after these key events: by 15% from the removal of the Nixon tariffs, by 28% from James Baker's start as Treasury Secretary (which marked the shift in US trade and currency policy under Reagan), and by 12% from the de-pegging of the Yuan in July 2005.

Third, in each case, the drop in the Dollar did not come about through market forces alone. Instead, it was due in large part to negotiated settlements with US trade partners—through the Smithsonian Agreement in December 1971, the Plaza Accord in September 1985, and diplomacy with China in 2005-06. Indeed, that was largely the point: actual and threatened protectionism was designed to bring about a change in the currency policies of trade partners, which the US government believed were unfair. After other countries agreed to revalue and the US trade balance began to improve (with the usual lags) actual or threatened tariffs were generally removed.³

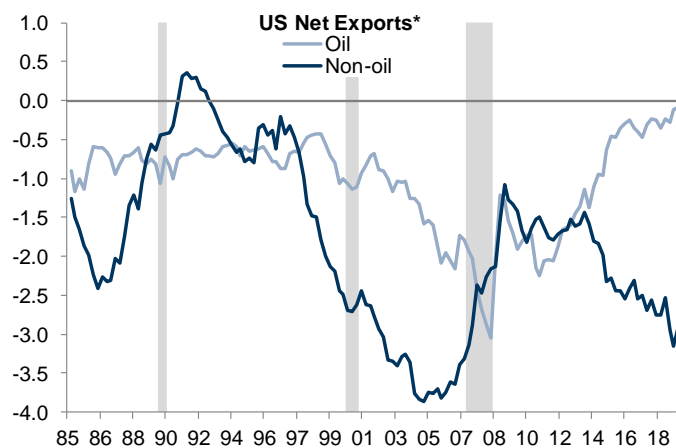
The macro, not the man

Just as past trade conflicts resulted largely from underlying macroeconomic forces that had negative aggregate and/or distributional consequences for the United States, the same is true today: President Trump may be more willing to take a head-on approach to trade and currency issues than others, but his concerns have a grounding in US economic conditions.

For example, the strong Dollar appears to be negatively affecting US trade in manufactured goods. This is difficult to see at the aggregate level due to the structural increase in US shale oil production and resulting improvement in net exports of petroleum. But stripping out oil, the US trade balance looks concerning: the non-oil trade balance (including services) has fallen to -3.0% of GDP from -1.4% of GDP at the end of 2013 (before the Dollar started to rise), and the non-oil goods trade balance has declined to -4.2% of GDP, close to its record low in 2005, and down from -2.9% of GDP at the end of 2013.

Concerning (non-oil) trend

US net exports*, % of GDP



*Including services. Source: BEA, Haver Analytics Goldman Sachs GIR.

² For example, Senators Schumer and Graham threatened to impose 27.5% tariffs on all US imports from China.

³ There were exceptions, especially continued trade policy actions against Japan in the late 1980s and early 1990s.

In addition, even if aggregate economic performance remains acceptable, trade outcomes can have long-lasting distributional consequences. For instance, a number of economists have come around to the view that trade competition has affected regional economic performance in the US. Focusing on China specifically, MIT professor David Autor and coauthors write:⁴

The reality of adjustment to the China trade shock has been far different [than the textbook prediction]. Employment has certainly fallen in US industries more exposed to import competition. But so too has overall employment in the local labor markets in which these industries were concentrated. Offsetting employment gains either in export-oriented tradables or in non-tradables have, for the most part, failed to materialize.

The key takeaway is that, while the specific goals and strategy around US trade policy may change under a new administration, the macroeconomic factors fueling the current dispute will not.

Depreciation for peace

It may be possible to improve US trade prospects without Dollar depreciation—through changes in trade policies by other nations, through an “internal devaluation” (real exchange rate depreciation through sustained weakness in domestic wages and prices at steady nominal exchange rates), or with the ongoing use of tariffs and other import protections. But history suggests that Dollar depreciation is again the most likely outcome today.

How might this come about? We see three possible scenarios, from least likely to most likely:

1. Unilateral intervention. If sufficiently concerned about weakness in the US trade balance, and seeing limited policy changes from other nations, the Administration may decide to take matters into its own hands and directly intervene in currency markets. While the US government has almost never intervened since the mid-1990s, the practice was commonplace before that, and it remains a standard policy tool for many countries. Assuming the Federal Reserve cooperated with the policy (which seems likely), there would be no theoretical limit to the scale of intervention—a country can always weaken its own currency if sufficiently determined. This option has a number of downsides, however, including the possibility that it encourages other countries to intervene, counteracting the intent of the policy. It may also raise political questions about the appropriateness of deliberate devaluation⁵ and whether the US should own Chinese assets in its reserves, and the risk that the Dollar could slide too far (something Paul Volcker worried about

during the Plaza Accord). For these reasons, unilateral intervention still appears unlikely.

2. Coordination with trade partners. An alternative to going it alone would be to seek a cooperative solution among major trade partners—along the lines of the Smithsonian Agreement or Plaza Accord. The US could agree, for example, to end protectionist practices in exchange for some greater openness from China, fiscal stimulus by Germany and Japan, and a coordinated effort to weaken the Dollar through intervention. While not inconceivable, this type of solution also seems unlikely for now. By most measures, the Chinese Yuan is not undervalued, and the PBOC currently works to keep the currency *stronger* than it otherwise would be. Moreover, German domestic politics currently prevent more expansionary fiscal policy in Europe’s largest economy (even if such an approach would be helpful at present) and Japan’s government worries about an already-large debt stock.

3. Market forces. Even without major policy changes, we expect medium-term Dollar depreciation as a natural consequence of market forces. First, from a cyclical standpoint, the factors that drove US outperformance and Dollar appreciation are reversing. Domestic growth has slowed, moving closer to the mediocre pace of expansion in much of the rest of the world, and interest rate differentials have narrowed as the Fed has shifted from tightening to easing. Second, from a more structural perspective, Dollar depreciation may result from persistent budget deficits. The US is running unusually large deficits during an expansion, and at a time when global foreign exchange reserves—a key source of demand for Treasuries—have been flat. Without high real interest rates, a weaker Dollar may be required to induce sufficient foreign demand for US borrowing.

Dollar strength likely unsustainable

To date, the US-China trade conflict has generally caused the Dollar to rise due to its effects on global growth prospects and the resulting flight-to-quality flows. But this is probably not sustainable: Dollar appreciation cuts against the Trump Administration’s goal of limiting US trade deficits and improving manufacturing competitiveness—as long as the Dollar keeps going up the trade war will not achieve much. Instead, a substantial Dollar depreciation would go a long way to supporting the Administration’s goals and alleviating global trade tensions—as it has in the past.

Zach Pandl, Co-Head of Global FX, Rates, and EM Strategy

Email: zach.pandl@gs.com
Tel: 212-902-5699

Goldman Sachs and Co. LLC

⁴ David Autor, David Horn, and Gordon Hanson, “The China Shock: Learning from Labor Market Adjustment to Large Changes in Trade.” Annual Review of Economics, 2016.

⁵ In his 1971 speech closing the gold window and introducing import tariffs, President Nixon took time to “lay to rest the bugaboo of what is called devaluation.”

Is China really a "currency manipulator"?

Andrew Tilton argues that Chinese policymakers *do* manage—but don't "manipulate"—the RMB, and have largely done so to *limit* depreciation of late

On August 5, the Chinese renminbi weakened past 7 per US Dollar for the first time in more than a decade. The next day, US Treasury Secretary Mnuchin declared China a "currency manipulator"—the first use of this label for any country since China was last designated in 1994.

In spirit, the Treasury designation is meant to call out countries that try to boost exports by keeping their currencies weaker than market forces would on their own. The key reason for this: As exchange rates are relative prices, they have a "zero sum" nature—implying relatively stronger net exports and production where currencies weaken, at the expense of lower production elsewhere. And given that the US runs the world's largest current account deficit, its policymakers have been especially keen to discourage trading partners from acting to weaken their currencies.

Ultimately, the designation of China as a "currency manipulator" was unusual in many respects, and its implications are more symbolic than anything else, in our view (see pg. 14). But it has nonetheless revived questions as to whether/how Beijing manages the RMB.

A large toolkit

The relevant authorities in China—specifically the People's Bank of China (PBOC) and State Association of Foreign Exchange (SAFE)—have a wide range of tools at their disposal to influence the market value of the RMB:

Intervention: This primarily entails policymakers buying/selling foreign exchange directly to influence the exchange rate. Official FX reserves have been quite stable since late 2016, implying minimal intervention, though without detailed data including transactions undertaken by state banks at the behest of authorities it's impossible to verify this. The PBOC also can take—and, at times, has taken—measures to increase the cost of "shorting" the currency, for example increasing the reserve requirement on onshore forwards or issuing bills in the CNH market to increase the cost of hedging offshore.

Policy guidance: This includes both verbal guidance—such as statements by PBOC policymakers—and quantitative guidance, specifically the daily USDCNY fixing. In recent years, the fixing has been based largely on the previous day's closing exchange rate and the broad USD move overnight, but the PBOC also employs a discretionary "[countercyclical factor](#)" to nudge the reference rate higher or lower, thus indicating its preference for the direction of travel.

Capital flows measures: Since the 2015-16 depreciation episode, the authorities have [tightened enforcement of outbound capital controls](#) in numerous ways—for example, cracking down on aggressive M&A by financial conglomerates, closing loopholes in Macau and Hong Kong, and increasing the administrative burden for households to acquire foreign exchange. The liberalization of outbound (QDII) and inbound (QFII

and RQFII) quotas for investment has occurred asymmetrically, with the former in focus when the currency is relatively strong and the latter when it is weaker.

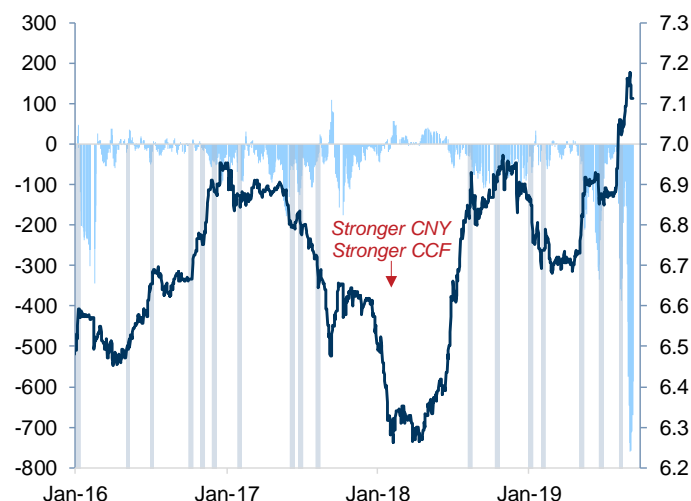
Deployment: Pushing back against depreciation

In recent years, Beijing has deployed several of these tools in a coordinated fashion to influence the value of the Yuan. For example, periods of RMB depreciation have typically been accompanied both by a stronger "countercyclical factor" and various capital outflow tightening measures.

This means Chinese policymakers have actively been attempting to influence the value of the currency—but mostly by *leaning against CNY weakness* rather than encouraging it. This has been especially true in recent weeks, with the largest countercyclical factors ever. The only recent (mild) tilt towards CNY weakness occurred in late 2017-early 2018 when the Chinese economy was performing well and the RMB had rallied to the strongest levels (lowest USDCNY) since the August 2015 currency reform.

China's "countercyclical factor" and capital flow measures generally coordinated

Countercyclical factor, 5dma*; capital outflow tightening measures**;
USD/CNY (rhs)



Note: List of discrete measures not shown given space constraints; additional unannounced measures are likely to have taken place as well.

*The "countercyclical factor" terminology was introduced in 2017, but our calculation is the same throughout.

**Additional unannounced measures are likely to have taken place as well.
Source: Bloomberg, Wind, Caixin, Reuters, GS Global Investment Research.

Currency manager, not manipulator

Given all of the above, in recent years, China has been more of a currency *manager*, using a variety of policy tools to influence the CNY exchange rate (especially to lean against sharp moves in either direction), than a "manipulator" seeking only to keep the currency weak. This is especially true over the past year, when policymakers have primarily acted to *limit the depreciation* of the CNY rather than push it weaker. In this context, it is not surprising that the US Treasury's August 6 announcement [hinted that presidential pressure](#) might have played a role in the decision to name China a "currency manipulator."

Andrew Tilton, Chief Asia Economist

Email: andrew.tilton@gs.com
Tel: 852-2978-1802

Goldman Sachs (Asia) L.L.C.

Renminbi refresher

Is it "CNY," "RMB," or "yuan"? All of the above. China's official currency is the renminbi (RMB), with the yuan as its basic unit. The two are often used synonymously when referring to the currency. CNY is the official code for the renminbi/yuan and refers to Chinese currency traded onshore, i.e., in mainland China.

How is the CNY exchange rate determined? Despite some gradual steps toward liberalization, the CNY remains managed by PBOC officials, who set a daily "fix," or target value, for the CNY against the USD and other major currencies. The PBOC announces a midpoint for CNY trading—the fix—every day at 9:15 am Beijing time. The CNY then trades around the fix within a band of $\pm 2\%$ (a range that was last widened in 2014). Throughout the trading period, the PBOC stands ready to buy or sell the amount of currency necessary to keep the exchange rate within the desired range. When the PBOC changed its exchange rate regime in 2015, it asked market makers to begin basing their contribution to the fixing on (1) the previous day's close for CNY, (2) supply and demand for CNY, and (3) the movements of other major currencies. In 2017, China introduced a new element in CNY fixing called the "countercyclical factor," which has typically been used to lean against strong moves in the currency.

What about the CNH? CNH, by contrast, refers to RMB that is traded offshore at a floating rate. Chinese policymakers established the CNH market in 2010 to pursue greater use of RMB for international trade and financial transactions (i.e., the "internationalization" of the RMB). Although the CNH market remains concentrated in Hong Kong, RMB has since become

deliverable in other places such as Singapore (CNS), Taiwan (CNT) and London (CNL). The gap between CNH and CNY is typically a good barometer for judging outflow pressures. When outflow pressures are high, CNH tends to trade weaker than CNY. However, the PBOC's FX management of CNH could distort this indicator, as was the case in 2016.

How do market participants gauge expectations for the CNY?

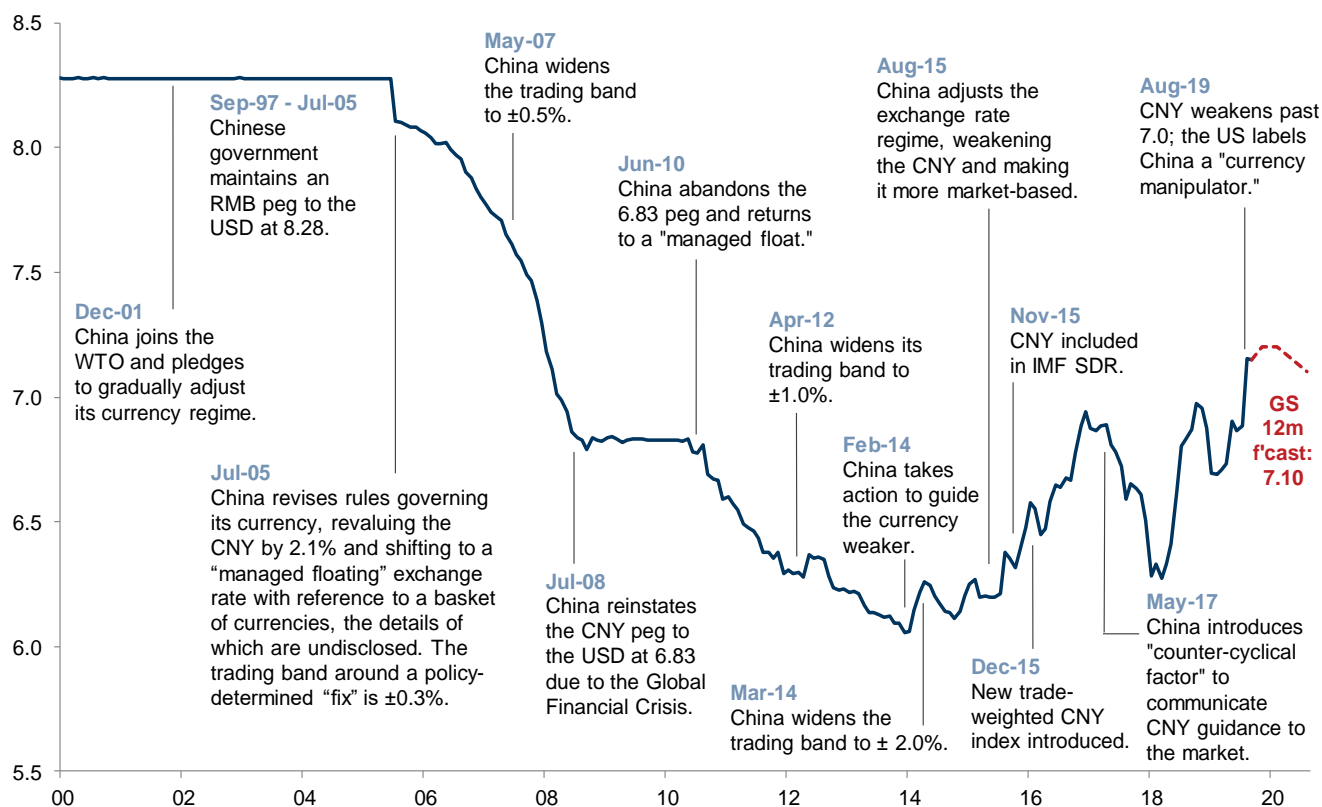
Non-deliverable forwards (NDFs) are a proxy for forward-looking views on the CNY. NDFs are used in situations where currency restrictions prevent the buyer from actually taking delivery of the purchased currency. When the contract comes due, it is settled in USD, with the buyer receiving (or paying) in USD the gain (or loss) that occurred due to exchange rate movements in the purchased currency. In China's case, the reference exchange rate for NDFs is the CNY fix, not the spot market rate.

What are Goldman Sachs' current CNY forecasts? Our current 3/6/12 month USDCNY forecasts are 7.20/7.20/7.10, as we see the CNY remaining under pressure in the near-to-medium-term as the trade wars continues. Given Beijing's reluctance to ease domestic policies significantly further, the risks are firmly on the side of more CNY depreciation as well as lower growth. More broadly, CNY will remain very sensitive to trade war developments.

For more, see [Global Economics Comment: Another Round of US-China Tariff Escalation \(August 26, 2019\)](#) and [Top of Mind: Reassessing the Renminbi \(May 21, 2014\)](#).

A brief history

\$/CNY



Source: Federal Reserve Board, Haver Analytics, various news sources, annotated by Goldman Sachs Global Investment Research.

Currency manipulator: what's in a name?

Michael Cahill argues that the “currency manipulator” designation is a mostly symbolic—but still important—signal

Last month, the US Treasury designated China a “currency manipulator.” It was the first time the US used that label since 1994. There are few practical consequences, especially compared to protectionist measures that have already been put in place. But the symbolism is important. And our reading of history suggests that the Treasury’s treatment of currency policy tends to go hand-in-hand with US’ broader trade agenda.

Laying down the law

The Treasury regularly reviews the currency practices of its major trading partners and reports its findings to Congress. This review simultaneously satisfies the requirements of two separate but related laws that deal with currency management—one from 1988, and another from 2015.

The 1988 Act is the relevant one for China today. It gives the Treasury complete discretion in its analysis to determine whether a country is manipulating its currency “for purposes of preventing effective balance of payments adjustments or gaining unfair competitive advantage in international trade.” But, when it comes to dealing with cases of manipulation, the law is similarly vague; it merely instructs the Treasury to “take action to initiate negotiations” either through the IMF or bilaterally. There is no guidance for how those negotiations should be conducted or what happens if they fail to bear any fruit. Practically speaking, the public label itself is the only direct consequence.

In contrast, the 2015 Act is more specific on the terms of the analysis, and carries some potential for retaliatory actions if negotiations are unsuccessful. But it does not really apply to China today. This law sets out three specific criteria for Treasury to analyze: a significant bilateral trade surplus, a material current account surplus, and persistent one-sided FX intervention. These criteria form the basis for getting placed on Treasury’s “Monitoring List” but are not actually directly related to whether or not a country is considered to be a “currency manipulator.” And, in any case, China only currently meets the first of the three criteria.

Bending the rules

Even under the looser standards of the 1988 Act, Treasury’s recent determination that China is manipulating its currency takes a pretty nonstandard approach. In the past, the US has mostly taken issue with countries that *buy* Dollar assets in order to weaken their own currencies. But, in this instance, Treasury implied that China’s unwillingness to *sell* its existing Dollar assets in order to strengthen or at least stabilize the Renminbi was evidence of manipulation. In addition, the determination was made without the usual accompanying analysis. Even setting those arguments aside, the 1988 law only instructs Treasury to take action against countries that have a material global current account surplus—China does not have one.

Moving with the trade winds

While the specifics of Treasury’s recent ruling might be unconventional, the broad direction is certainly not. Our reading of history suggests that this report tends to be treated as one tool in multi-faceted trade relationships. For example, in late 2005 there was intense political pressure to label China a manipulator. Treasury acknowledged that it found some of China’s currency policies to be “troubling,” but said other factors like its commitments to domestic growth factored into its decision to hold off. More recently, over the course of 2018 Treasury’s analysis increasingly singled out China and took a harsher tone, mirroring broader US trade policy. Today, the actual decision to label China a “currency manipulator” may not carry any practical considerations, but it is yet another signal that the two sides are moving further apart.

Broadening the scope

Similarly, while trade policy—and Treasury’s currency analysis—focused intently on China in 2018, we see signs that both are broadening into other areas. In its most recent report, Treasury included a number of smaller trading partners—such as Thailand and Vietnam—in its analysis for the first time. We think it’s no coincidence that Treasury has started to take a wider view of currency policy right now, and cannot rule out that other countries or currency practices will come into focus.

Michael Cahill, Senior FX Strategist

Email: michael.e.cahill@gs.com
Tel: +44-20-7552-8314

Goldman Sachs International

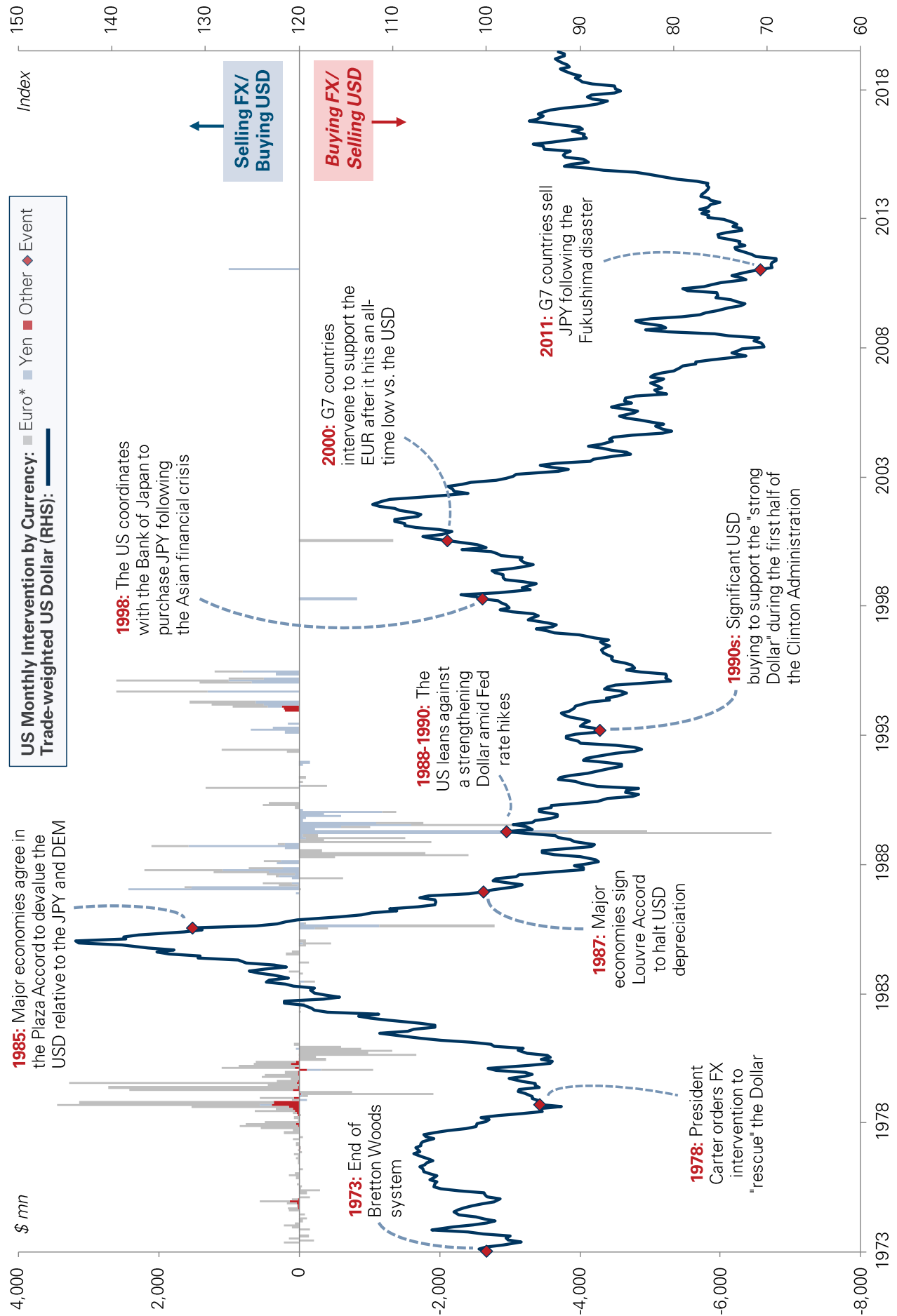
Breaking down manipulator status

Legal framework and consequences of US “currency manipulator” designation

US Treasury	1988 Act	-->	<i>Reviews major trading partners with a material global CA surplus and a significant bilateral trade surplus with the United States.</i>	Treasury then considers whether a country manipulates FX in order to prevent BoP adjustments or gain unfair trade advantage.	If in violation, the Treasury Secretary enters into negotiations with the country bilaterally or through the IMF to correct the situation. (Current status for China)
	2015 Act	-->	<i>Compiles report on economic and FX policies of major trading partners, including specific elements such as the bilateral trade balance, current account balance and FX reserves.</i>	Measures against 3 criteria: (i) significant trade surplus w/US (ii) material CA surplus (iii) persistent, one-sided FX intervention	Enhanced analysis and enhanced bilateral negotiations Remedial Actions (if appropriate action not taken in 1 year)

Source: Goldman Sachs Global Investment Research.

Long history of US FX intervention



Source: Bloomberg, Fed, various news sources, Goldman Sachs Global Investment Research.

Asset implications of a currency war

How would US intervention to weaken the USD impact your asset class?

FX Zach Pandl, Kamakshya Trivedi & Team

DM: So far, the rising risk of currency intervention has had only a fleeting influence on DM FX. The EUR and JPY have both strengthened against the USD for a few hours on several occasions after “verbal interventions” by President Trump, or as the market waited to see whether pending trade announcements would include an FX element. But if the Trump Administration began to more seriously consider currency intervention, within G10 FX we would look for it to limit the scope for further EUR depreciation.

RATES Praveen Korapaty & Team

US: FX intervention to weaken USD would likely be bullish for US duration, as it would probably be interpreted by markets as risk-negative and increase expectations for further Fed easing. More broadly, we think that US yields may settle into a new range in the near term, having corrected higher from year-to-date lows, and we don't see the recent flattening in the US yield curve as a stable equilibrium.

Europe: The announcement of US FX intervention [would likely spark](#) a decline in market-based inflation expectations and a rally in nominal European rates. But with recent new lows in EUR yields, the prospect for rates to move lower [looks limited](#), and we could be entering a period of consolidation after the ECB's September meeting.

CREDIT (EM) Caesar Maasry & Team

EM: EM sovereign spreads have historically traded in line with the USD (widening during periods of USD appreciation), but this trend has broken somewhat during 2019. A weaker USD might prove to be incrementally negative for EM credit fund flows, as investors may look to local bond funds which have underperformed credit this year (GBI-EM up 5.5% year to date vs. EMBIG-DIV up 13%).

EQUITIES David Kostin, Peter Oppenheimer, Tim Moe & Teams

US: Recent USD strength has generally supported the outperformance of the most domestic-facing US stocks relative to foreign-facing firms. So while US intervention to weaken the USD would likely serve to increase geopolitical risk and market volatility, it would also offset some of the current earnings headwinds to US firms with high foreign sales exposure.

China: All else equal, if CNY were to appreciate against the USD, it would be positive for Chinese equities due to: 1) translation gains for H shares/ADRs, 2) less concern about FX mismatches, and 3) less pressures on capital outflows.

EM: EM equities have continued to trade with a significant negative correlation to the USD—so a weaker USD may boost MSCI EM at face value. However, should FX intervention lead to a weaker USD (and stronger CNY), this may increase investor concern about the China growth outlook, which is ultimately a more important driver to EM equity returns than movements in the USD.

How would further CNY depreciation impact your asset class?

FX Zach Pandl, Kamakshya Trivedi & Team

- **China:** If the Chinese authorities were to just use FX to offset the growth impact of the trade war, the trade-weighted CNY would in theory need to depreciate by 3.3%, which equates to a move to 7.30 in USD/CNY. However, in practice, we expect the authorities to use a combination of easing tools, and forecast USD/CNY at 7.20/7.10 on a 6m/12m horizon, respectively.
- **EM:** If the CNY depreciated further, we would look for potential movement in currencies most sensitive to CNY, such as KRW, MYR, TWD and SGD; on the flipside, the EM Asia currencies most resilient to changes in CNY are INR, PHP, and THB.

COMMODITIES Jeff Currie & Team

- With China now the marginal producer of many industrial commodities, the pass-through from changes in FX to commodity pricing has become immediate. CNY weakness benefits domestic commodity industries such as zinc, nickel, or aluminium where China is a huge producer and exporter. But it also weakens China's purchasing power, which is relevant for commodities where China is a large net importer, such as platinum or copper. Therefore, additional CNY depreciation would be negative for USD metals prices, all else equal. That said, the second-order effect of a CNY depreciation may be positive for metals if it means easier financial conditions in China. While recent copper price declines came hand-in-hand with a weaker CNY, the negative impact will likely be partly offset by stronger domestic demand and policy stimulus.
- A sharply lower CNY (not our base case) is a significant downside risk for base and bulk commodities, as it would likely come as a result of a further severe trade escalation and worsening domestic demand conditions in China. We estimate that a 10% depreciation of the CNY vs USD would spell as much as 13% downside to the S&P GSCI industrial metals sub-index.

CREDIT (US) Lotfi Karoui & Team

- **US:** A further depreciation in CNY would increase the appeal of safe haven currencies like JPY, and if the JPY continues to appreciate against the USD, this would likely temper Japanese demand for USD credit, as a stronger JPY would cause FX-related losses in unhedged portfolios and reduce future demand.

EQUITIES David Kostin, Kathy Matsui, Peter Oppenheimer, Tim Moe & Teams

- **Europe:** Additional CNY depreciation versus the USD would likely impact [two groups of European stocks](#): (1) companies generating a large share of revenue in China, which would likely underperform, and (2) European companies exposed to the US, which tend to outperform when USD strengthens. That said, the basket of European companies exposed to the US wouldn't be our favorite implementation in order to position for trade war concerns and growth-related risks.

Summary of our key forecasts

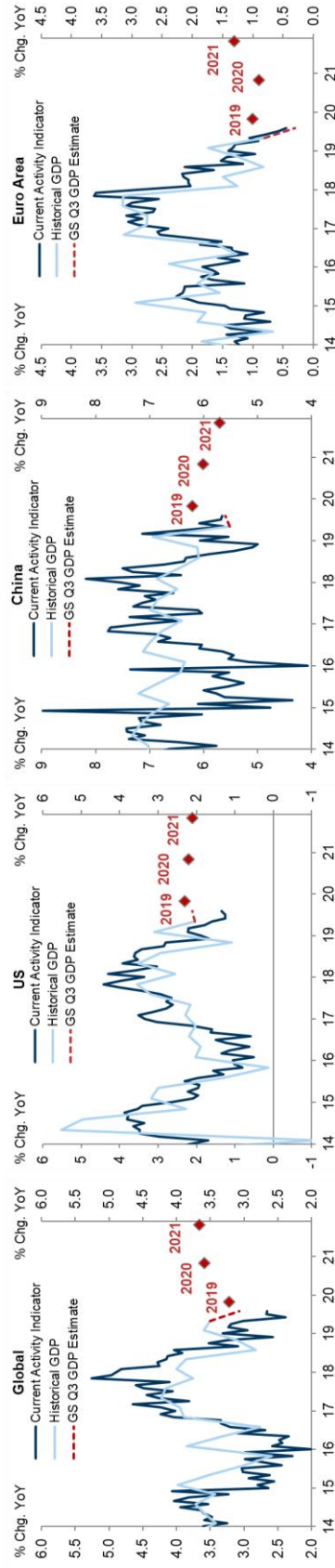
GS GIR: Macro at a glance

Watching

- **Global growth** was 2.7% in August (vs. 4% one-year prior); we still expect trend-like GDP growth of 3.2% in 2019 aided by a synchronized tilt towards policy easing, although trade tensions present downside risk.
- **In the US**, we expect the renewed trade escalation to keep growth at around 1.8% in H2, down from 2.6% in H1. While trade war escalation and slower momentum have recently increased recession risk, we still believe that US recession fears are overblown, with the likelihood of recession still well below 50% through next year, in our estimation.
- **We think the Fed will deliver two additional 25bp cuts this year**, in September and October; we see the funds rate remaining below 2% through the 2020 election.
- **In the Euro area**, we expect industrial weakness and continued trade war risks to keep GDP growth at a subdued 0.5% pace in H2 2019 and see only a modest growth pick-up to 0.9% in 2020, largely on the assumption of an orderly Brexit resolution and a pause in the global trade war (no auto tariffs). We now see 55% odds of a Brexit deal before the October 31 deadline.
- **We expect the ECB to cut rates by 20bp, re-start net asset purchases, and deliver stronger forward guidance in September** given still-slimyish growth/inflation in the Euro area and strong signals of additional easing at the bank's July meeting.
- **In China**, we expect full-year GDP growth of 6.2% in 2019, after a slowdown in recent months. We expect additional modest policy easing in the coming months, though trade tensions still pose a downside risk to growth.
- **WATCH TRADE.** We expect the Trump Administration to raise existing tariffs rates on Chinese goods and implement additional tariffs in October and December, respectively. Although a US-China trade deal is possible before the 2020 US presidential election, it's not our base case. We do not expect broad US auto tariffs. We believe passage of the revised NAFTA (USMCA) is more likely than not by year-end.

Source: Goldman Sachs Global Investment Research

Growth



Source: Haver Analytics and Goldman Sachs Global Investment Research.
 Note: GS CAI is a measure of current growth. For more information on the methodology of the CAI please see "Trackin' All Over the World - Our New Global CAI," Global Economics Analyst, February 25, 2017.

Forecasts

Economics	2019			2020			Markets			Equities											
	GS	Cons.	Mkt.	GS	Cons.	Mkt.	Last	E2019	E2020	12m	YTD	E2019 P/E									
GDP growth (%)	3.2	3.2	3.6	3.2	3.2	3.6	1.72	1.75	2.10	EUR/\$	1.10	1.08	1.15	Price	3,400	--	S&P500	12.0	20.5	18.3x	
US	2.3	2.3	2.2	1.8	1.8	2.2	-0.55	-0.55	-0.20	GBP/\$	1.24	1.20	1.35	EPS	\$177	\$183	MXAPJ	2.0	8.7	14.6x	
China	6.2	6.2	6.0	6.0	6.0	6.0	-0.23	-0.30	-0.10	\$/JPY	107	103	100	Growth	6%	11%	Topix	3.0	7.5	13.5x	
Euro area	1.0	1.1	0.9	1.1	1.1	1.1	0.55	0.70	1.10	\$/CNY	7.11	7.20	7.10	STOXX 600	5.0	14.6		5.0	14.6	14.9x	
Policy rates (%)	2019			2020			Commodities			Credit (bp)			Wage Tracker 2019 (%)								
US	1.63	1.40	1.88	1.25	1.25	1.25	2.6	2.5	2.5	USD	IG	118	108	115	US	Unemp. Rate	3.3	3.0	3.4	Q1	Q2
Euro area	-0.60	-0.68	-0.60	-0.71	-0.71	-0.71	62.4	62	60	Crude Oil, Brent (\$/bbl)	HY	368	342	365	Euro area	Unemp. Rate	7.7	7.4	--	--	--
China	2.25	2.46	2.50	2.51	2.51	2.51	5,797	6,400	7,000	Copper (\$/mt)	IG	124	112	119	China	Unemp. Rate	--	7.0	7.0	7.0	7.0
Japan	-0.05	-0.18	-0.05	-0.21	-0.21	-0.21	1,488	1,575	1,600	Gold (\$/troy oz)	HY	357	336	357	Japan	Unemp. Rate	--	--	--	--	--

Source: Bloomberg, Goldman Sachs Global Investment Research.

As of Sep. 10, 2019.

Glossary of GS proprietary indices

Current Activity Indicator (CAI)

GS CAIs measure the growth signal in a broad range of weekly and monthly indicators, offering an alternative to Gross Domestic Product (GDP). GDP is an imperfect guide to current activity: In most countries, it is only available quarterly and is released with a substantial delay, and its initial estimates are often heavily revised. GDP also ignores important measures of real activity, such as employment and the purchasing managers' indexes (PMIs). All of these problems reduce the effectiveness of GDP for investment and policy decisions. Our CAIs aim to address GDP's shortcomings and provide a timelier read on the pace of growth.

For more, see our [CAI page](#) and [Global Economics Analyst: Trackin' All Over the World – Our New Global CAI, 25 February 2017](#).

Dynamic Equilibrium Exchange Rates (DEER)

The GSDEER framework establishes an equilibrium (or "fair") value of the real exchange rate based on relative productivity and terms-of-trade differentials.

For more, see our [GSDEER page](#), [Global Economics Paper No. 227: Finding Fair Value in EM FX, 26 January 2016](#), and [Global Markets Analyst: A Look at Valuation Across G10 FX, 29 June 2017](#).

Financial Conditions Index (FCI)

GS FCIs gauge the "looseness" or "tightness" of financial conditions across the world's major economies, incorporating variables that directly affect spending on domestically produced goods and services. FCIs can provide valuable information about the economic growth outlook and the direct and indirect effects of monetary policy on real economic activity.

FCIs for the G10 economies are calculated as a weighted average of a policy rate, a long-term risk-free bond yield, a corporate credit spread, an equity price variable, and a trade-weighted exchange rate; the Euro area FCI also includes a sovereign credit spread. The weights mirror the effects of the financial variables on real GDP growth in our models over a one-year horizon. FCIs for emerging markets are calculated as a weighted average of a short-term interest rate, a long-term swap rate, a CDS spread, an equity price variable, a trade-weighted exchange rate, and—in economies with large foreign-currency-denominated debt stocks—a debt-weighted exchange rate index.

For more, see our [FCI page](#), [Global Economics Analyst: Our New G10 Financial Conditions Indices, 20 April 2017](#), and [Global Economics Analyst: Tracking EM Financial Conditions – Our New FCIs, 6 October 2017](#).

Global Leading Indicator (GLI)

The GS GLI was designed to provide a timelier reading on the state of the global industrial cycle than existing alternatives did, and in a way that is largely independent of market variables. The GLI has historically provided early signals on global cyclical swings that matter to a wide range of asset classes. The GLI currently includes the following components: a consumer confidence aggregate, the Japan IP inventory/sales ratio, Korean exports, the S&P GS Industrial Metals Index, US initial jobless claims, Belgian and Netherlands manufacturing surveys, the Global PMI, the GS AUD and CAD trade-weighted index aggregate, global new orders less inventories, and the Baltic Dry Index.

For more, see our [GLI page](#) and [Global Economics Paper No. 199: An Even More Global GLI, 29 June 2010](#).

Goldman Sachs Analyst Index (GSAI)

The US GSAI is based on a monthly survey of GS equity analysts to obtain their assessments of business conditions in the industries they follow. The results provide timely "bottom-up" information about US economic activity to supplement and cross-check our analysis of "top-down" data. Based on analysts' responses, we create a diffusion index for economic activity comparable to the ISM's indexes for activity in the manufacturing and nonmanufacturing sectors.

Macro-Data Assessment Platform (MAP)

GS MAP scores facilitate rapid interpretation of new data releases for economic indicators worldwide. MAP summarizes the importance of a specific data release (i.e., its historical correlation with GDP) and the degree of surprise relative to the consensus forecast. The sign on the degree of surprise characterizes underperformance with a negative number and outperformance with a positive number. Each of these two components is ranked on a scale from 0 to 5, with the MAP score being the product of the two, i.e., from -25 to +25. For example, a MAP score of +20 (5;+4) would indicate that the data has a very high correlation to GDP (5) and that it came out well above consensus expectations (+4), for a total MAP value of +20.

Top of Mind archive: click to access



Issue 81
Central Bank Independence
August 8, 2019



Issue 65
Has a Bond Bear Market Begun?
February 28, 2018



Issue 80
Dissecting the Market Disconnect
July 11, 2019



Issue 64
Is Bitcoin a (Bursting) Bubble?
February 5, 2018



Issue 79
Trade Wars 3.0
June 6, 2019



Special Issue
2017 Update, and a Peek at 2018
December 14, 2017



Issue 78
EU Elections: What's at Stake?
May 9, 2019



Issue 63
Late-Cycle for Longer?
November 9, 2017



Issue 77
Buyback Realities
April 11, 2019



Issue 62
China's Big Reshuffle
October 12, 2017



Issue 76
The Fed's Dovish Pivot
March 5, 2019



Issue 61
Fiscal Agenda in Focus
October 5, 2017



Issue 75
Where Are We in the Market Cycle?
February 4, 2019



Issue 60
The Rundown on Runoff
September 11, 2017



Special Issue
2018 Update, and a Peek at 2019
December 20, 2018



Issue 59
Regulatory Rollback
July 26, 2017



Issue 74
What's Next for China?
December 7, 2018



Issue 58
The Fed's Dual Dilemma
June 21, 2017



Issue 73
Making Sense of Midterms
October 29, 2018



Issue 57
Geopolitical Risks
May 16, 2017



Issue 72
Recession Risk
October 16, 2018



Issue 56
Animal Spirits, Growth, and Markets
April 17, 2017



Issue 71
Fiscal Folly
September 13, 2018



Issue 55
European Elections: More Surprises Ahead?
March 14, 2017



Issue 70
Deal or No Deal: Brexit and the Future of Europe
August 13, 2018



Issue 54
Trade Wars
February 6, 2017



Issue 69
Emerging Markets: Invest or Avoid?
July 10, 2018



Special Issue
2016 Update, and a Peek at 2017
December 19, 2016



Issue 68
Liquidity, Volatility, Fragility
June 12, 2018



Issue 53
The Return of Reflation
December 7, 2016



Issue 67
Regulating Big Tech
April 26, 2018



Issue 52
OPEC and Oil Opportunities
November 22, 2016



Issue 66
Trade Wars 2.0
March 28, 2018



Issue 51
US Presidential Prospects
October 18, 2016

Source of photos: www.istockphoto.com, www.shutterstock.com, US Department of State/Wikimedia Commons/Public Domain.

Disclosure Appendix

Reg AC

We, Allison Nathan, David Groman, Michael Cahill, Zach Pandl, Alec Phillips, and Andrew Tilton hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

Disclosures

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs trades or may trade as a principal in debt securities (or in related derivatives) of issuers discussed in this report.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage. **Analyst**

compensation: Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy generally prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director or advisor of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman Sachs & Co. LLC and therefore may not be subject to FINRA Rule 2241 or FINRA Rule 2242 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the companies and other entities which are the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting. To the extent that the contents of this document contains any financial product advice, it is general advice only and has been prepared by Goldman Sachs without taking into account a client's objectives, financial situation or needs. A client should, before acting on any such advice, consider the appropriateness of the advice having regard to the client's own objectives, financial situation and needs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests and a copy of Goldman Sachs' Australian Sell-Side Research Independence Policy Statement are available at: <https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html>. **Brazil:** Disclosure information in relation to CVM Instruction 598 is available at <https://www.gs.com/worldwide/brazil/area/gir/index.html>. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 20 of CVM Instruction 598, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** Goldman Sachs Canada Inc. is an affiliate of The Goldman Sachs Group Inc. and therefore is included in the company specific disclosures relating to Goldman Sachs (as defined above). Goldman Sachs Canada Inc. has approved of, and agreed to take responsibility for, this research report in Canada if and to the extent that Goldman Sachs Canada Inc. disseminates this research report to its clients. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C. **India:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited, Research Analyst - SEBI Registration Number INH000001493, 951-A, Rational House, Appasaheb Marathe Marg, Prabhadevi, Mumbai 400 025, India, Corporate Identity Number U74140MH2006FTC160634, Phone +91 22 6616 9000, Fax +91 22 6616 9001. Goldman Sachs may beneficially own 1% or more of the securities (as such term is defined in clause 2 (h) the Indian Securities Contracts (Regulation) Act, 1956) of the subject company or companies referred to in this research report. **Japan:** See below. **Korea:** This research, and any access to it, is intended only for "professional investors" within the meaning of the Financial Services and Capital Markets Act, unless otherwise agreed by Goldman Sachs. Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **New Zealand:** Goldman Sachs New Zealand Limited and its affiliates are neither "registered banks" nor "deposit takers" (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for "wholesale clients" (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. A copy of certain Goldman Sachs Australia and New Zealand disclosure of interests is available at: <https://www.goldmansachs.com/disclosures/australia-new-zealand/index.html>. **Russia:** Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. Research reports do not constitute a personalized investment recommendation as defined in Russian laws and regulations, are not addressed to a specific client, and are prepared without analyzing the financial circumstances, investment profiles or risk profiles of clients. Goldman Sachs assumes no responsibility for any investment decisions that may be taken by a client or any other person based on this research report. **Singapore:** Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union: Disclosure information in relation to Article 6 (2) of the European Commission Delegated Regulation (EU) (2016/958) supplementing Regulation (EU) No 596/2014 of the European Parliament and of the Council with regard to regulatory technical standards for the technical arrangements for objective presentation of investment recommendations or other information recommending or suggesting an investment strategy and for disclosure of particular interests or indications of conflicts of interest is available at <https://www.gs.com/disclosures/europeanpolicy.html> which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan and Type II Financial Instruments Firms Association. Sales

and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; Ombudsman Goldman Sachs Brasil: 0800 727 5764 and / or ouvidoriagoldmansachs@gs.com. Available Weekdays (except holidays), from 9am to 6pm. Ouvidoria Goldman Sachs Brasil: 0800 727 5764 e/ou ouvidoriagoldmansachs@gs.com. Horário de funcionamento: segunda-feira à sexta-feira (exceto feriados), das 9h às 18h; in Canada by either Goldman Sachs Canada Inc. or Goldman Sachs & Co. LLC; in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman Sachs & Co. LLC. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

European Union: Goldman Sachs International authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, has approved this research in connection with its distribution in the European Union and United Kingdom.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. The information, opinions, estimates and forecasts contained herein are as of the date hereof and are subject to change without prior notification. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman Sachs & Co. LLC, the United States broker dealer, is a member of SIPC (<https://www.sipc.org>).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and principal trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, principal trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

We and our affiliates, officers, directors, and employees, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research, unless otherwise prohibited by regulation or Goldman Sachs policy.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is focused on investment themes across markets, industries and sectors. It does not attempt to distinguish between the prospects or performance of, or provide analysis of, individual companies within any industry or sector we describe.

Any trading recommendation in this research relating to an equity or credit security or securities within an industry or sector is reflective of the investment theme being discussed and is not a recommendation of any such security in isolation.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options and futures disclosure documents which are available from Goldman Sachs sales representatives or at <https://www.theocc.com/about/publications/character-risks.jsp> and https://www.fiadocumentation.org/fia/regulatory-disclosures_1/fia-uniform-futures-and-options-on-futures-risk-disclosures-booklet-pdf-version-2018. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

Differing Levels of Service provided by Global Investment Research: The level and types of services provided to you by the Global Investment Research division of GS may vary as compared to that provided to internal and other external clients of GS, depending on various factors including your individual preferences as to the frequency and manner of receiving communication, your risk profile and investment focus and perspective (e.g., marketwide, sector specific, long term, short term), the size and scope of your overall client relationship with GS, and legal and regulatory constraints. As an example, certain clients may request to receive notifications when research on specific securities is published, and certain clients may request that specific data underlying analysts' fundamental analysis available on our internal client websites be delivered to them electronically through data feeds or otherwise. No change to an analyst's fundamental research views (e.g., ratings, price targets, or material changes to earnings estimates for equity securities), will be communicated to any client prior to inclusion of such information in a research report broadly disseminated through electronic publication to our internal client websites or through other means, as necessary, to all clients who are entitled to receive such reports.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For research, models or other data related to one or more securities, markets or asset classes (including related services) that may be available to you, please contact your GS representative or go to <https://research.gs.com>.

Disclosure information is also available at <https://www.gs.com/research/hedge.html> or from Research Compliance, 200 West Street, New York, NY 10282.

© 2019 Goldman Sachs.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.