

TOP *of* MIND

FISCAL FOCUS



With monetary policy nearly exhausted in the major economies, low interest rates globally, and schools of thought like Modern Monetary Theory (MMT) that advocate for much larger money-financed deficit spending getting more airtime, whether fiscal policy should play a greater role from here is Top of Mind. We feature interviews with former IMF Chief Economist, Olivier Blanchard, Harvard professor, Alberto Alesina, and GS Chief Economist, Jan Hatzius. They discuss whether increased fiscal stimulus today would do more good than harm, and, even if it would, whether the economies that need it the most will pursue it. Our key takeaways: Germany should embrace a large fiscal expansion, but likely won't; investors should expect some

more fiscal stimulus in China, but only enough to avoid a sharp slowdown; and potentially meaningful implications for fiscal policy are another reason to watch the 2020 US presidential election.

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Nearly by definition, when interest rates are low—and especially if the interest rate is lower than the growth rate—debt dynamics are more favorable... So, yes, low interest rates increase the room to use fiscal policy.

- Olivier Blanchard

I think we should keep a longer-term perspective. Yes, interest rates are low, and they may be low for a while, but they won't be low forever. And when they rise, of course the cost of debt will increase again.

- Alberto Alesina

Private sector deficits are often more dangerous than public sector deficits. The difference between public and private sector deficits is that governments don't run out of the ability to borrow in a crisis.

- Jan Hatzius

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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

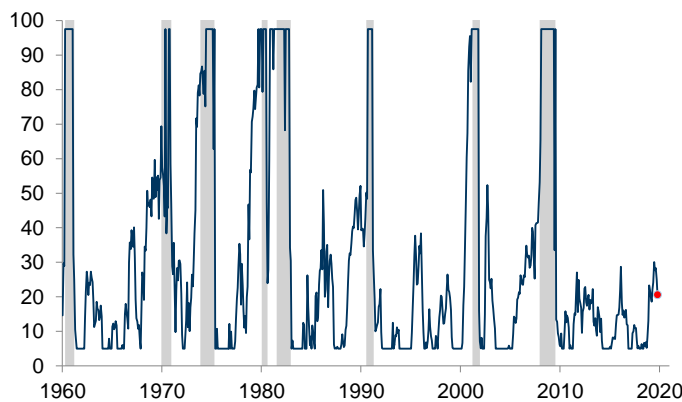
- We expect 2020 US growth to rise to 2.5% (Q4/Q4) off of a recovery in housing, strength in consumer spending, and a fading inventory drag; our estimated odds of a US recession within the next 12 months have fallen to 20%.
- We now believe US tariffs on imports from China have peaked, and assume a partial rollback of tariffs.

Datapoints/trends we're focused on

- A gap in labor and product market inflation that should leave core inflation at 1.7% by spring 2020 despite wage growth tracking around 3¼%.

Recession risk recedes

Predicted odds of a US recession within 12 months, %



Note: The plotted values are trimmed at 5% and 97.5%.

Source: Goldman Sachs Global Investment Research.

Japan

Latest GS proprietary datapoints/major changes in views

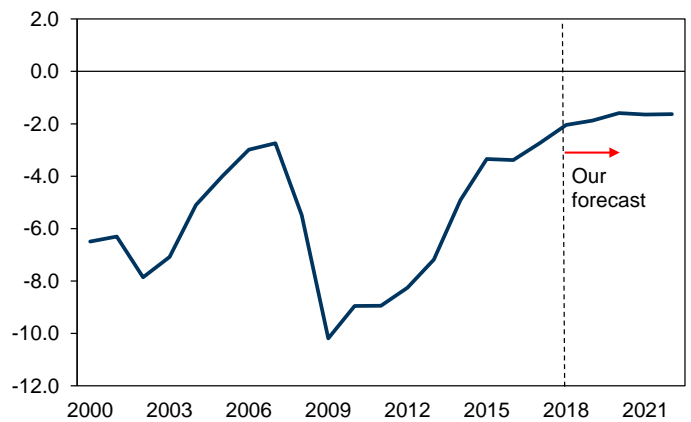
- We think Japan growth will slow to 0.4% in 2020, down from 0.9% in 2019, primarily due to the impact of the October 2019 consumption tax hike.
- We now expect the government to pass a fiscal stimulus package of around ¥5tn (\$46bn) in 2020.

Datapoints/trends we're focused on

- The BOJ's ability to manage further yen depreciation; while we don't expect additional rate cuts in 2020, we do think the BOJ could more strongly consider taking rates deeper into negative territory if JPY/USD approaches 100.

Fiscal turning less negative

General government fiscal balance, % of GDP



Source: Cabinet Office, Goldman Sachs Global Investment Research.

Europe

Latest GS proprietary datapoints/major changes in views

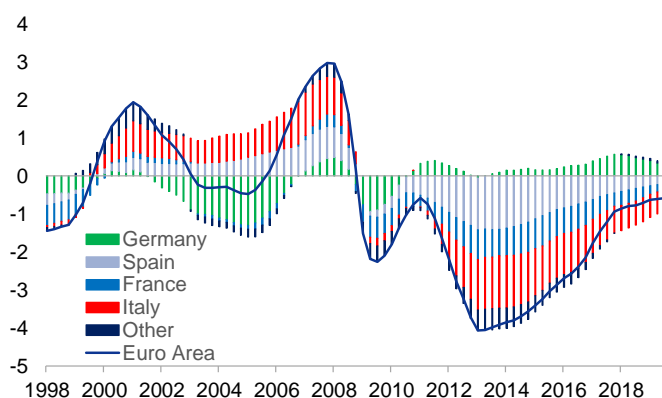
- We expect Euro area growth to pick up to 1.1% next year and now think the ECB will keep rates on hold.
- We think UK growth will rebound to 2.4% (ann.) in H2 2020 off of reduced Brexit uncertainty and a sizable fiscal impulse.

Datapoints/trends we're focused on

- The UK's Dec 12 general election; current polls point to an increased majority for current PM Boris Johnson, which we think would lead to a Brexit deal before the end of January.
- Still slack, despite the Euro area unemployment rate declining to the lowest level since early 2008.

Still slack

Contributions to Euro Area output gap, percent



Source: Goldman Sachs Global Investment Research.

Emerging Markets (EM)

Latest GS proprietary datapoints/major changes in views

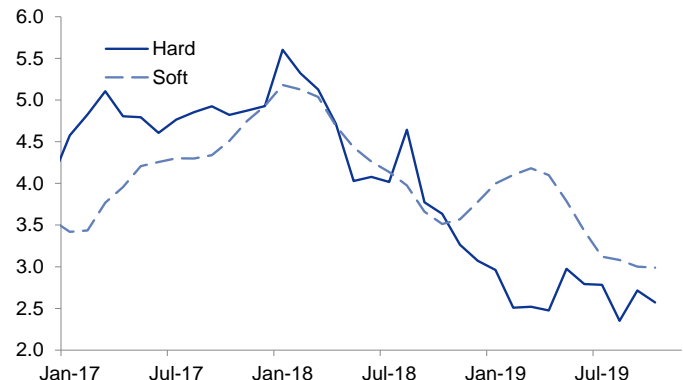
- We expect EM growth to rise to 4.8% in 2020, driven largely by improvements in India, Russia, and Brazil.
- We've lowered our expectation for China growth in 2020 by 0.1pp to 5.8%.

Datapoints/trends we're focused on

- The November EM PMIs, which will provide an important signal after stabilization in our EM Current Activity Indicators.
- Disappointing China growth and credit data in October despite a sizable rebound in September.

Some stabilization

Current activity in EMs ex-China by hard and soft data, %, 3mma



Note: continuous lines are 3m MA.

Source: Goldman Sachs Global Investment Research.

Fiscal policy

With monetary policy nearly exhausted in the major economies, low interest rates globally, and schools of thought like Modern Monetary Theory (MMT) that advocate for much larger money-financed deficit spending getting more airtime, whether fiscal policy should play a greater role from here is Top of Mind. This is especially the case in the Euro area, where former and current ECB presidents, Mario Draghi and Christine Lagarde, have directly called for as much. We dig into whether increased fiscal stimulus would do more good than harm, and, even if it would, whether the economies that need it the most will actually use it.

We first sit down with Olivier Blanchard, former Chief Economist of the IMF, whose recent work has focused on fiscal issues. He argues that there's reason to be less worried about higher government deficits today than in the past given persistently low interest rates, which reduce the future costs of deficits and the risk that debt rises to problematic levels. And this is especially true if interest rates are lower than growth rates, as they are now. So he sees greater room for the use of fiscal policy from here. He is generally agnostic about which fiscal measures to use, but tends to favor public investment. And he thinks the case for fiscal expansion is most compelling in the Euro area given its limited remaining room for monetary stimulus and current small fiscal deficits—although he doubts they will employ as much as they should (but he's holding out hope for green investment.)

Jan Hatzius, GS Chief Economist, generally agrees that larger deficits and higher debt levels are not particularly concerning for most advanced economies today. In general, he worries much less about public sector than private sector deficits given the latter can go bankrupt and the former can't. And he also believes that Germany in particular should pursue greater fiscal expansion, which he thinks would likely provide a powerful boost to growth, but will probably fall short in reality.

But when it comes to more aggressive forms of fiscal stimulus like money-financed deficits—whereby the government prints new (interest-free) money to finance public spending—Blanchard and Hatzius are more skeptical. Hatzius believes this type of measure could move things in the right direction when the economy is depressed, and therefore could be somewhat useful in places like the Euro area and Japan today. This is especially the case since the biggest risk of money-financed deficits—too much inflation—is small in these economies right now. But he doesn't believe that running large deficits in this way is never a problem, and cautions that much higher debt levels would likely generate financial market volatility and eventually higher inflation. Blanchard agrees and is perhaps even more concerned about the inflationary consequences; he doesn't see how financing deficits with interest-free money won't lead to overheating and eventually high—or even hyper—inflation.

That said, Zach Pandl, GS co-head of rates, FX and EM, contends that when inflation is too low, growth is weak and economies are operating at the Effective Lower Bound (ELB), governments can afford to be more aggressive, and that money-financed fiscal easing would likely go a long way in solving these ills. He argues that increased fiscal-monetary policy coordination in this manner could improve overall macro outcomes, as long as there is an appropriate governance structure that guards against the slippery slope of fiscal indiscipline and high inflation.

Alberto Alesina, Professor of Political Economy at Harvard University, is not as sanguine about the use of fiscal policy. Although he too thinks fiscal expansion in places like Europe probably makes sense today, he advises keeping a longer-term perspective; at some point, interest rates will be higher again. He also emphasizes that while some countries, like Germany, can afford larger deficits, others, like Italy, can't. More broadly, he argues that not all fiscal measures are equal; much higher multipliers for tax cuts than for increased spending suggest fiscal expansion should focus on the former. And, for that matter, he sees fiscal consolidation via spending cuts and tax cuts as potentially expansionary.

With all of the above in mind, we dig deeper into the room for fiscal expansion—and the likelihood that it's utilized—in the major economies today. We start with the country our interviewees think is the most obvious candidate for more fiscal stimulus: Germany. Jari Stehn, GS Head of Europe Economics, agrees that that case for greater fiscal expansion in Germany is convincing given its current weak growth, chronic public underinvestment, and the fact that looser German fiscal policy could also help enable looser Euro area monetary policy (more German debt issuance equals more sovereign bonds available for the ECB to buy.) But he estimates that fiscal headroom in Germany even without violating EU fiscal rules far exceeds planned stimulus, and that's unlikely to change unless we see a much more severe downturn. In that context, George Cole, GS senior rates and FX strategist, argues that fiscal policy won't be the main reason we've likely seen the bottom in European rates, but we've probably seen it nonetheless.

Andrew Tilton and Naohiko Baba, GS Chief Asia and Japan economists, respectively, also see relatively constrained support from fiscal policy in Asia's two biggest economies—China and Japan. Although China has increased fiscal stimulus to boost the economy since growth began to slow last year, Tilton thinks that policymakers have shifted to a more conservative stance, with a greater focus on controlling risks. This has basically amounted to doing the bare minimum to avoid a sharp slowdown—a stance he expects to continue. And Japan is moving in the opposite direction—Baba says—with the government recently raising the national consumption tax in a further attempt to rein in Japan's large fiscal deficit amid already high debt levels—although they are attempting to do so in a less disruptive way than in the past.

Finally, GS Chief US Political Economist, Alec Phillips, argues that fiscal stimulus in the US—where the case for it is the weakest—is set to fade, despite the likelihood that President Trump will likely propose a tax cut in the run-up to the election next year. But he also believes that the 2020 presidential election could have meaningful implications for fiscal policy, so yet another reason to keep our eyes peeled on it (as they already are...!)

We wish our US clients a Happy Thanksgiving, and hope you will check out the podcast version of this and other recent GS Top of Mind reports—on [Apple](#) and [Spotify](#).

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Interview with Olivier Blanchard

Olivier Blanchard is a Senior Fellow at the Peterson Institute and the former Chief Economist of the International Monetary Fund. His recent work has focused on the lower costs and risks of public debt in an environment of low interest rates. Below, he argues that the space for fiscal policy is larger today than in the past, and that fiscal policy could be especially beneficial for economies at the ELB.

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



Allison Nathan: Discussions about the use of fiscal stimulus today often start with the fact that interest rates are very low, and markets expect them to remain low for the foreseeable future. But shouldn't we worry that markets are wrong?

Olivier Blanchard: Nothing is for sure, and the markets could be wrong. But there are reasons to think that they are right. First, low real rates today are not a fluke; they have been on a declining trend since the mid-1980s. Second, while I wish we better understood the role of the various secular factors behind this declining trend, most of the factors we have identified are likely to persist. And, third, the market's conviction in this view is notable. The yield curve suggests markets are convinced that rates will remain low, and option markets are pricing a very low probability of rates increasing. So, I think it is reasonable to assume that low rates will continue. But even if markets turn out to be wrong, governments today can lock in current low rates for 10, 20, even 30 years by issuing long-maturity bonds.

Allison Nathan: So are big fiscal expansions less problematic for debt dynamics today than in the past?

Olivier Blanchard: Nearly by definition, when interest rates are low—and especially if the interest rate is lower than the growth rate—debt dynamics are more favorable. The future costs of deficits are lower. The risk that debt rises to levels that require large primary surpluses in the future, which may be difficult to generate, is lower. In fact, if the interest rate is lower than the growth rate, as is the case today, it's possible to run small primary deficits and still have a falling debt-to-GDP ratio. So, yes, low interest rates increase the room to use fiscal policy.

Allison Nathan: Should we be worried that your advice will lead to large deficits/high debt levels, which will weigh on growth and increase vulnerability to crises down the road?

Olivier Blanchard: Yes, I worry. But to be clear, I'm not advocating fiscal indiscipline... I'm advocating fiscal discipline adapted to the current environment, which allows governments to be a bit more relaxed about debt than in the past. Now, if investors panicked in the face of rising debt levels, growth would take a hit. And very high debt levels could have an adverse impact on growth by creating a debt overhang, making borrowing challenging. But none of the major economies are anywhere close to that situation today.

Going beyond these crisis scenarios, the usual concern is that debt accumulation reduces capital accumulation. To start, that's only true when the economy is at full employment. Below full employment, a larger deficit may actually increase investment. But assuming that debt decreases capital accumulation, the

question is how costly is that decrease in terms of future output? If the rate of return on capital is low, the displacement may not be that costly, or even costly at all. In my view, low safe rates today are telling us that risk-adjusted rates of return on capital are low. So even if we are crowding out capital by running deficits even in an economy that is at full employment, the long-run cost may not be large.

Allison Nathan: Does fiscal stimulus make sense today just because rates are near/at the effective lower bound (ELB)?

Olivier Blanchard: Absent the ELB, lower interest rates would still provide a case for aiming at higher target debt levels and for adjusting deficits more slowly. For example, public investment clearly becomes more attractive the lower the borrowing cost. But at the ELB—when monetary policy is constrained—the case for fiscal policy to support demand and help maintain output at potential becomes compelling. And today—short of much more unconventional measures than central banks are willing to take—I see little headroom left for monetary policy. The US, where short-end policy rates are positive, is perhaps the exception. But in places like the Euro area or Japan, I think what monetary policy can do from here is marginal. Even if we could achieve large negative real rates, the concern is that we end up hitting the “reversal rate,” at which point monetary policy no longer works the way it should, with people, for example, increasing rather than decreasing their saving in response to a lower rate. For these reasons, we have to assume that the room for monetary policy is very limited, and this implies the need for fiscal policy to play a larger role.

Allison Nathan: Does the type of fiscal expansion matter? Some people argue that bigger multipliers for tax cuts versus spending increases—along with the risk of unproductive spending—suggests fiscal expansions should always be conducted via tax cuts, which makes the fact that interest rates are low less relevant. What do you say to that?

Olivier Blanchard: Different fiscal measures have different multipliers, and some might be bigger than others because of psychological effects, and so forth. But in the current environment, I think a larger fiscal deficit will be expansionary, whether it's done through lower taxes or higher spending. Different measures have different pros and cons. Some are harder to undo later, which is a consideration if there could be a need to decrease the deficit in the future. Some measures—like public infrastructure—have positive long-run effects, assuming the infrastructure is needed. And some tax measures are more beneficial than others. I'm basically pragmatic and agnostic about the appropriate composition of fiscal policy. That said, today, I would be happiest if fiscal deficits financed public investment.

Allison Nathan: So to what extent should fiscal stimulus be playing a larger role today? Let's start with the Euro area.

Olivier Blanchard: The Euro area has a relatively small fiscal deficit and monetary policy at the ELB. In my view, it still has a negative output gap, meaning that output could be increased without generating overheating. For these reasons, I am in favor of a fiscal expansion, and against the consolidation that fiscal rules in the region currently dictate. If Germany finds itself in recession, I think they should be ready to use fiscal policy more than the rules allow.

Allison Nathan: Is Europe likely to pursue the fiscal expansion it needs? What explains the hesitancy to do so?

Olivier Blanchard: I'm just back from Europe, and I had many discussions about this. The fiscal rules in the region are a constraint. They are not always respected. But they still affect behavior. For example, countries like Italy are scared of the market's punishment if they violate them. These rules come from somewhere—a strong fear of debt and inflation in countries like Germany, which has historical validity. This fear is so deeply-rooted that in some cases there is a refusal to even consider the macro aspects of fiscal policy; the view is debt is debt and the less you have of it, the better. So a mix of rules, beliefs, and unwillingness to think about the macroeconomic implications has constrained German fiscal policy, and, in turn, Euro area fiscal policy. I suspect that unless there is a serious slowdown, the Euro area will not pursue the fiscal policy it needs.

That said, I do see signs that the mindset is evolving. Not everybody shares Germany's perspective. There is also increasing demand for green investment, which is much stronger in Europe than in the US, and which is indeed relatively strong in Germany, especially as the Greens may become part of the ruling coalition. Even people who don't like debt are more open to the notion of investing to protect against global warming, and maybe financing some of it by debt. Because of the externalities, that type of measure must be taken at the European level. There's hope for progress, but I'm not holding my breath.

Allison Nathan: What about Japan? To what extent should it be employing fiscal stimulus?

Olivier Blanchard: Japanese policymakers have used aggressive monetary and fiscal policy for close to 20 years now. The potential growth rate in Japan isn't great, and output is roughly at potential. So what should they do today? On the one hand, any attempt to substantially reduce the deficit would likely weigh on growth given limited monetary stimulus. So I opposed the recent increase in their consumption tax. On the other hand, Japan's debt has reached levels that are a bit worrisome, even to me. So I am not in favor of Japan pursuing a further fiscal expansion and think they have to find other ways to stimulate demand that rely less on fiscal deficits.

Allison Nathan: Hasn't Japan's experience shown that persistent fiscal deficits—alongside aggressive monetary stimulus—can't get you out of a low growth/inflation trap?

Olivier Blanchard: No, I think that's the wrong argument. The reason why growth is low in Japan has very little to do with fiscal and monetary policy. It has to do with challenging demographics that have left Japan with low potential growth. I see Japanese demand policy largely as a success. Faced with very low domestic private demand, and a reluctance to adjust through currency

depreciation, monetary and fiscal policy has done nearly the best job they could.

Allison Nathan: What about the US? Did the recent tax cut make sense? What role should fiscal policy play today?

Olivier Blanchard: When the corporate tax cut was under discussion, I worried that the boost to demand was not needed and would lead to overheating. That did not happen. As it turns out, it may be that if the US had run smaller deficits, the Fed might have had to stay at lower rates, and we may have found ourselves with lower growth over this period and less monetary policy headroom than we have today. But I think the deficits could have been used much better. The corporate tax cut doesn't seem to have increased investment much, and it has had adverse distributional effects. I am sure that infrastructure investment would have been more useful. Today, with the US running a deficit of more than 5% and the economy at full employment, I think the US should decrease its deficit, but only slowly, because the Fed doesn't have much margin to maintain output at potential if fiscal policy is contractionary.

Allison: Would there be a benefit from more coordination between fiscal and monetary policymakers?

Olivier Blanchard: Far away from the ELB, there is not much need for coordination. For example, the central bank can lower interest rates in response to fiscal consolidation to ensure that the fiscal contraction doesn't lead to recession. This was done during the Clinton-Greenspan era. But the current situation is completely different because the central bank can't just offset fiscal policy. For this reason, there's a case for closer coordination to achieve a more optimal outcome. For example, Europe could probably benefit from additional public spending and higher—i.e. positive—nominal rates, but that would require a large amount of coordination between individual countries and the ECB.

Allison Nathan: How do your views on a larger use of fiscal policy differ from proponents of MMT, who call for governments to finance deficits by printing more money?

Olivier Blanchard: Not for lack of trying, I'm honestly not sure what MMT proponents believe or not. But if we leave MMT aside, and focus on the argument that large deficits can be money financed without major problems, I think that argument is wrong. You can indeed finance deficits with interest-paying money, which is effectively identical to financing deficits via bond issuance, except instead of paying interest on your debt, you're paying interest on reserves held by the central bank. But if you aim to money finance the deficit without paying interest on money, then the large deficit implies that you have to print an enormous amount of non-interest paying money relative to the existing demand. This leads to a massive increase in the supply of non-interest paying money against limited demand, and pushes the interest rate down to zero. So you end up with an interest rate at zero and a very large deficit. The likely eventual outcome is overheating, and eventually high or hyperinflation; the old notion that printing a lot of money eventually leads to hyperinflation still holds today, and the only way to avoid it is by paying interest on the money, just as you do on a bond issuance. I'm not sure that money financing a large deficit without paying interest on the money is what MMT proponents are advocating. But if it is, they're wrong.

Interview with Jan Hatzius

Jan Hatzius is Chief Economist at Goldman Sachs. Below, he argues that the cyclical case for fiscal expansion is much stronger in the Euro area than in Japan and the US today.



Allison Nathan: Should fiscal policy play a bigger role as Mario Draghi and Christine Lagarde have called for?

Jan Hatzius: In Europe, I agree that the case for expansionary fiscal policy on cyclical grounds is quite clear. This is especially true for Germany, which is running a large fiscal surplus at a time when interest rates are deeply negative,

GDP growth is barely positive, inflation is well below target, and monetary stimulus—while not fully depleted—is likely to be relatively limited at this point. In Japan, I think fiscal expansion—rather than the consolidation Japanese policymakers are generally pursuing—could also be useful given lackluster growth, stubbornly low inflation, and very limited monetary policy headroom. But Japan's already high fiscal deficit/debt level and relatively tight labor market make this a less clear-cut case than in Europe. And in the US, I don't see a compelling cyclical case for fiscal stimulus right now considering the current combination of growth near potential, early signs of a pickup, inflation that is relatively close to—albeit still below—the Fed's target, some monetary policy headroom, and already high fiscal deficits/debt levels.

Allison Nathan: Is it typical to use fiscal stimulus at this point in the cycle?

Jan Hatzius: The use of fiscal policy for cyclical reasons this deep into a business expansion is unusual. Fiscal expansions driven by cyclical considerations typically occur during or immediately after a recession, like the Obama stimulus of 2009. Of course, it's also quite unusual for monetary policy to be as constrained as it is today. So, many things are different about this cycle relative to previous cycles. That said, a significant downturn in the economy would further strengthen the case for easier fiscal policy in Europe, and reinforce or introduce one for Japan and the US. That's especially the case given that monetary tools are likely to be grossly insufficient to deal with a significant negative shock to the economy in Europe and Japan, and maybe even in the US.

Allison Nathan: Given that we are so late in the cycle, how much could fiscal stimulus actually boost growth in the economies you think need it most?

Jan Hatzius: In Europe, I think fiscal stimulus could provide a powerful boost. Fiscal multipliers are likely to be relatively large because there probably wouldn't be a monetary policy offset. In other words, if fiscal stimulus pushed Euro area growth back up from close to zero currently to a sustained above-trend pace of 1.5-2%, the ECB likely wouldn't tighten policy in response. In Japan, the likely effectiveness of fiscal stimulus is less clear because the real economy has actually performed quite well and the labor market is already relatively tight. So, the impact that fiscal expansion would have on real output might not be that great. That said, if fiscal expansion led to even some incremental upward pressure on employment, and that fed into stronger wage growth—and ultimately higher inflation—that would be a good thing.

Allison Nathan: Given that unprecedented monetary easing has failed to sustain growth and boost inflation in the Euro area, why do you think fiscal expansion can?

Jan Hatzius: When judging the effectiveness of monetary stimulus, we have to ask what the economy would have looked like without it. I believe that if the ECB hadn't pursued negative interest rate policies and QE as it did, the Euro area would be in much worse shape today. Although the recovery has been gradual, unemployment rates in the region are down nearly five percentage points since those policies were employed, and continue to fall. The concern today is that the higher growth pace achieved in late 2017/early 2018 has slowed to a trickle. So, while monetary stimulus has supported the recovery, it's clearly less effective now than it once was. Supplementing it with fiscal policy therefore makes a lot of sense to me.

Allison Nathan: You've argued in the past that the ECB was late to embrace easier monetary policy. Have Euro area fiscal authorities made the same mistake?

Jan Hatzius: Yes. Fiscal policymakers absolutely should have been doing more in Europe for many years. The post-crisis lethargy has been quite costly; I don't have much doubt that Europe would be in a better position today if fiscal policy had been easier in the post-crisis period. But Europe was not alone in this; after the stimulus program of 2009/10, the US, too, had a period of significant fiscal retrenchment, which took more than 1 percentage point per year off growth in 2011-13, by our estimates. This was wholly inappropriate given that the US unemployment rate was still 9% in 2011. Of course, the US has moved well past this period, but I generally believe that fiscal policy has been too tight in some of the biggest economies for much of the post-crisis period.

Allison Nathan: Even if Euro area policymakers should embrace more fiscal stimulus, the question is, will they?

Jan Hatzius: We are seeing some expansion, but much less than what we need. We currently expect a fiscal impulse of 0.3pp of GDP in the Euro area in 2020, which is not a lot in an economy that is near stagnation. So policymakers are moving in the right direction, but at a frustratingly slow pace.

Allison Nathan: Are Euro area fiscal rules a constraint to more fiscal expansion? Are these types of rules useful?

Jan Hatzius: I'm not against fiscal rules in principle, but I think the way that many of them have been implemented has been harmful in practice. For example, the Euro area's Stability and Growth Pact, which limits government deficits to 3% of GDP without taking account of the cyclical position of the economy, has been quite damaging, in my view. It forced countries such as Spain to retrench hard in 2010-2013, despite the fact that much of the deficit was due to the deep recession and the sky-high unemployment rate. The German Debt Brake, which limits structural deficits to 0.35% of GDP, is not currently binding, so it wouldn't stand in the way of a bigger fiscal expansion today. But I frankly think 0.35% of GDP is too small; a much larger limit designed to protect against what could be truly deleterious debt

build-ups would be a more sensible rule. And don't even get me started on the US debt limit, which also ignores the cyclical position of the economy and is additionally specified in terms of the nominal debt stock rather than the debt/GDP or deficit/GDP ratio. This, along with the highly-politicized process for lifting it, makes the US debt ceiling a very problematic rule.

Allison Nathan: Underlying these rules is an assumption that large deficits and high debt levels are ultimately harmful to growth. Does this assumption still hold?

Jan Hatzius: At some level of debt, I think it has to hold. Extremely indebted economies will be less well-positioned to invest in areas like infrastructure that promote growth over the longer term. But Europe is so far from this situation today, it's just not relevant in my view. In the US, the relatively high deficit and debt levels suggest gradual consolidation probably needs to occur over the longer term, but I also don't think it's a major priority right now, at least partly because the low level of interest rates today has reduced the debt service burden associated with high debt stocks. In Japan, the argument that fiscal consolidation is necessary to limit growth in the already very high debt-to-GDP ratio is more plausible. But many economists over several decades have repeatedly raised their assessment of what debt-to-GDP levels are sustainable. And at this point, there's no sign that even the quite high Japanese debt-to-GDP ratio is inflicting significant harm.

Allison Nathan: Relatedly, are concerns that large deficits/high debt will leave your economy more vulnerable to crisis less relevant today?

Jan Hatzius: I think so. Concerns that were especially prevalent in the early part of the post-crisis period about crowding out, the eventual monetization of large deficits, high inflation, and runs on government debt markets were misplaced; I believed that to be the case back then, and have even more conviction today. The reason these fears never came close to playing out was that economies were cyclically depressed, characterized by high unemployment, low inflation and substantial spare capacity. For advanced economies with floating exchange rates and inflation-targeting central banks, fear of a fiscal crisis in that type of environment was unreasonable. Of course, for countries without floating exchange rates and a central bank that can act against a run on the bond markets, the situation is somewhat different; so this fear is more realistic for countries like Portugal or Greece, for example. But I don't think that Europe as a whole is overly indebted or that even a sizable fiscal expansion from here would materially increase Europe's vulnerability to a crisis.

Allison Nathan: Modern Monetary Theorists (MMT) argue that deficits don't matter for countries that have their own currency. Do you agree with their perspective?

Jan Hatzius: I agree that a country with its own currency and a central bank that can purchase government debt can't technically go bankrupt. That's nothing more than an accounting identity, but it was probably missed by at least some of the people who thought there was going to be a run on US or European

government debt in the aftermath of the crisis. I also agree with the idea that private sector deficits are often more dangerous than public sector deficits. The difference between public and private sector deficits is that governments don't run out of the ability to borrow in a crisis, while the private sector can lose access to credit markets. And if that happens in a downturn—especially if the starting point is a substantial private sector deficit—then a large retrenchment in private sector spending relative to income must occur, which then deals a significant blow to aggregate demand, typically pushes the economy into recession, and can trigger a financial crisis. This pattern played out not only in 2008, but also in several other financially-driven recessions over the last 30 years. So, I think the risk that excessive public sector deficits cause a crisis is indeed much smaller than many economists have historically feared.

Allison Nathan: So can government simply print more money to finance higher deficits with little risk?

Jan Hatzius: I wouldn't go as far as to say that because a government can't technically go bankrupt, deficits are never a problem. Even most proponents of MMT will say that inflation is a constraint; so, you should run and monetize deficits until inflation becomes a problem and then you should rein it in. In that sense, I view MMT as a very aggressive form of Keynesian macroeconomic policy, which is usually a good idea when the economy is depressed and far away from full employment, but a much less good idea when you're at full employment. From that perspective, I was sympathetic to many of the policy prescriptions of MMT proponents in the early years after the crisis because they got you to the right place, whether or not you agreed with all of the tenets.

Today, I think the merits of employing MMT policy prescriptions depend on where you sit. In the US, I'm generally not sympathetic because the economy is effectively at the Fed's dual mandate, and very aggressive stimulus could ultimately do more harm than good in terms of inflationary pressures. Even outside the inflation risk, a sudden decision to run a much larger annual deficit could push up long-term interest rates in a way that destabilizes the financial markets and ultimately the real economy. It's just not worth the risk given how well the US is doing from a cyclical perspective. In Europe and to some degree Japan, by contrast, the economy would likely still benefit from aggressive stimulus.

Allison Nathan: Setting MMT aside, should policymakers pursue greater monetary and fiscal policy coordination?

Jan Hatzius: I don't think explicit fiscal and monetary policy coordination is necessary as long as central banks do their job appropriately in pursuing their mandates. If that's the case, then in a situation that requires fiscal stimulus, the central bank will effectively cooperate and be patient in responding to the inflationary pressures that emerge. Bottom line: You don't need explicit coordination unless the central bank is pursuing an overly-restrictive policy—and if that's the case, it will probably be difficult for fiscal and monetary authorities to agree on a coordinated policy anyway.

Interview with Alberto Alesina

Alberto Alesina is the Nathaniel Ropes Professor of Political Economy at Harvard University, where his research focuses on macroeconomics and political economy. He is most recently the author of *Austerity: When It Works and When It Doesn't* (with Carlo Favero and Francesco Giavazzi, 2019.) Below, he argues that there is a bit too much complacency about higher deficits and debt today, but if countries pursue fiscal expansion, they should do so via tax-based fiscal stimulus.

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



Allison Nathan: Today, the consensus view seems to be that large fiscal deficits and high debt levels are less of a problem now than in the past. Has consensus become too sanguine?

Alberto Alesina: Yes, I think so. In general, public discourse—including among economists—has been too one-

sided. Before the financial crisis, there was a period called the Great Moderation characterized by high growth, low inflation, and subdued volatility. At the time, discussions were all about how the period of cycles was over, and we had reached nirvana. Then, the financial crisis hit and the narrative became that everything was collapsing and periodic crises were the new normal. Now, interest rates are low and the prevailing view is that they will stay low forever, so we can borrow as much as we want and won't have a debt problem.

I think we should keep a longer-term perspective. Yes, interest rates are low, and they may be low for a while, but they won't be low forever. And when they rise, of course, the cost of debt will increase again. I'd add that even with generally low interest rates today, highly indebted countries may still face a large spread, so the cost of debt is not that cheap for them. In general, I would be more even-handed in looking at the past to predict the future, and a bit more prudent about advising large fiscal stimulus in many countries that can't afford it even today.

“ I would be more even-handed in looking at the past to predict the future, and a bit more prudent about advising large fiscal stimulus in many countries that can't afford it even today.”

Allison Nathan: That said, does a wider use of fiscal stimulus make sense in some countries today?

Alberto Alesina: Yes. For example, some fiscal stimulus may be appropriate in Europe given low growth and limited monetary policy ammunition. This may be particularly the case for some countries, like Germany, which can afford it, versus others, like Italy, that can't.

But I think the discussion about fiscal stimulus is too generic. Some fiscal stimulus, such as spending on useless programs or on pensions that will ultimately prove unsustainable given aging populations, is never a good idea. Overall, I think that any fiscal expansion should focus on cutting taxes rather than on

increasing spending, for two reasons. First, spending by many European governments is already quite high and sometimes inefficient. And, second, an avalanche of evidence now shows that tax multipliers are much bigger than spending multipliers, so, for a given amount of added deficit, the beneficial effect on output is much bigger when taxes are lowered/capped versus when spending is increased.

“ I think that any fiscal expansion should focus on cutting taxes rather than on increasing spending.”

Allison Nathan: Are some types of tax cuts more productive in stimulating growth than others?

Alberto Alesina: While substantial evidence shows that the tax multiplier is bigger than the spending multiplier, it's less clear that capping or cutting some types of taxes is more beneficial than others. This may depend on the tax structure, which differs substantially across countries. In general, cutting taxes on the middle class, at least in the short term, tends to stimulate consumption more because the middle class' propensity to consume is higher. And capping labor taxes is typically particularly beneficial for employment.

Allison Nathan: Some argue that the Trump tax cuts have done little to boost growth. Has that influenced your thinking about tax-based stimulus?

Alberto Alesina: I think it's too soon to come to that conclusion. The data needed to analyze the impact of the recent tax cuts on the economy is still being accumulated, and, once we have it, we'll need to examine it closely. Certainly, the US economy has not fallen into recession and seems to be doing reasonably well. How much of that is due to the tax cut and how much of it could have happened anyway is difficult to assess at this point.

Allison Nathan: Even if tax cuts are typically more effective than spending boosts, aren't some types of spending productive?

Alberto Alesina: Sure. But, in general, in high tax countries, tax cuts are preferable when pursuing fiscal expansions. That said, whether spending is productive depends on what the money is spent on. For example, there's a view that spending on infrastructure is always very productive. That may be true for some countries today, like the US and perhaps Germany, where there is a relatively clear need for infrastructure investment. But some countries, such as Spain and France, may have actually overinvested in infrastructure. So whether even this type of spending is useful depends on the context.

Allison Nathan: You advocated for highly indebted European countries to embrace austerity in the wake of the financial/sovereign debt crisis. In retrospect, did such polices hurt or help these economies?

Alberto Alesina: Certainly, austerity—the aggressive pursuit of fiscal consolidation—contributed to, but was not the only culprit of, a period of low growth in the countries that employed it. The question is: what would have happened without that austerity? It's easy for critics to say that Europe would have been better off without it. But without austerity the Euro area would have likely found itself in an even bigger mess, with other countries like Italy or Spain suffering financial crises. I think the fact that things didn't get even worse in Europe actually owed in large part to the willingness of some countries to engage in austerity to fight against a potential crisis, as well as to the decisive actions of Mario Draghi.

It's also important to note that while some countries such as Italy are still struggling, other countries that employed even harsher austerity policies like Spain, Portugal, and Ireland are now doing very well. So, the idea that austerity is responsible for all of Europe's current woes has been blown way out of proportion. But, more importantly, countries that cut spending did much better than countries that raised taxes.

“ A perfectly disciplined fiscal policy is one that allows deficits to increase during recession and surpluses to accumulate during booms. And, in fact, the use of austerity would almost never be necessary if governments were disciplined in this way.”

Allison Nathan: So, are fiscal discipline and austerity-focused policy approaches getting too bad a rap these days?

Alberto Alesina: I don't like the phrase “fiscal discipline.” Stimulating an economy by running fiscal deficits during recession does not mean there is a lack of fiscal discipline. A perfectly disciplined fiscal policy is one that allows deficits to increase during recession and surpluses to accumulate during booms. In fact, the use of austerity would almost never be necessary if governments were disciplined in this way; I'd say that 90% of the times that governments have been forced to pursue austerity, they have done so to make up for the inappropriate use of fiscal policy in the past. So, I think we should stop using this morally-charged rhetoric that implies running a

deficit is “undisciplined,” or, on the opposite side, that the use of austerity is only advocated by terrible people who want the population to suffer.

Today, running a deficit in Germany is probably a very reasonable idea, and there is nothing undisciplined about it. On the other hand, advocating that countries like Italy, Spain, and Portugal should have addressed their debt in the wake of the crisis was not morally despicable; austerity based upon spending cuts was a good policy given the situation.

All that said, for countries that must embark on austerity to undue past mistakes, I think that since spending multipliers are lower than tax multipliers, lowering spending and lowering taxes would actually be expansionary. That is, austerity can be expansionary.

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Allison Nathan: Might that be the case for Italy? What is the right policy mix for Italy from here?

Alberto Alesina: Determining the right policy mix in Italy is tricky because averages don't mean anything there. Parts of the economy are very productive, boasting some of the most competitive companies in the world. And other parts are very unproductive, dragging down overall productivity. This divergence can be found even within the same sector in some cases. But it's very difficult to move human and capital resources from the unproductive to the more productive parts of the economy. So while people are fixated on relatively small shifts in the deficit and narrow reforms, the reality is that the economy requires major reforms to fix what's broken. Unfortunately, nobody seems to have the capacity or the political support to do this today. So, Italy will most likely continue to muddle through. The good news is that the current government is at least committed to fiscal stability. The risk is that this government fails and elections empower the populist parties on the right, which could take Italy in a more anti-European and dangerous fiscal direction. At that point, anything can happen.

Break-the-glass fiscal policy

Zach Pandl argues that much better macro outcomes could be achieved through responsible monetary-fiscal policy coordination

The trade disputes and geopolitical risks that rumbled global markets over the last year came at a particularly inconvenient time for many governments. With interest rates close to or below zero across developed market economies, monetary policy had little capacity to respond to these new threats to growth. But policymakers are not helpless. Fiscal policy can and should be used to support growth in economies with weak inflation and monetary policy constraints, as long as they can borrow in their own currency.

Time for a rethink

Governments aiming to achieve growth and stable inflation have two main tools at their disposal: monetary policy (setting interest rates and varying the money supply) and fiscal policy (taxes and government spending). In modern times, most countries have preferred to use monetary policy to manage the economy over the business cycle, and probably for good reason: it has little to no “cost,” can be deployed quickly, and is perhaps easier to delegate to a non-political agency. In contrast, fiscal policy has some drawbacks: government spending creates public goods which might be hard to take away (e.g. hospitals), deficits create interest expenses and may harm fiscal sustainability, and elected officials may be tempted to use fiscal policy to support short-run political goals. For these reasons, most nations have decided that it is best to leave the fiscal “cookie jar” high in the pantry, slightly out of reach.

It is now time to rethink this approach. Monetary policy remains the first and best option for macro management, but it is plain to see that it has not been enough. Two of the world’s largest economies—the Euro Area and Japan, which together account for about 15% of global GDP, or about the same size as the United States—have held short-term interest rates below zero for half a decade and still struggle with weak growth and low inflation. Both the ECB and the BOJ may cut a little more if the financial system and public opinion will tolerate it. But from a broader standpoint it’s clear they are out of room.

In this environment, the same cost-benefit analysis that holds back fiscal policy in normal times arrives at different answers. Start with interest cost. What is the interest cost of zero-interest debt? This is not a trick question: it is zero. Concepts of debt sustainability also change when interest rates fall. Take for example an economy with a 100% debt-to-GDP ratio, 2% growth and 2% interest rates. In this economy, a primary deficit of 1% of GDP will add 1% to the debt stock, taking it to 101%. However, with this same mix of debt and deficits, if interest rates are zero the debt stock will actually *fall* by 1% to 99% of GDP. The reason is that nominal growth eats into the real cost of debt, such that it is possible to have both deficits and falling debt (as a share of GDP) at low interest rates.

So what is to be done?

At the very least, certain governments should take advantage of the complementarities between fiscal and monetary policy to provide additional support to the economy when rates are stuck at their practical minimum. This is most attractive for countries with low-to-moderate debt stocks, such as Germany or Sweden. Ideally, additional borrowing would be aimed at investments that would boost long-term growth—e.g. infrastructure, education—to aid debt sustainability. Tail risks exist with this type of borrowing, even at super-low rates: negative nominal growth or large declines in asset prices could result in higher debt-to-GDP ratios over time. But, in our view, risk-reward considerations are clearly balanced toward action.

Two birds, one stone

It’s possible to do even better, however, through deliberate coordination between monetary and fiscal policies. To understand how, we first have to think carefully about government borrowing and money—a point emphasized by adherents of Modern Monetary Theory (MMT) as well as many prominent economists (e.g. both Friedman and Keynes).

Numerous economies today face two interrelated problems: (i) weak real activity (i.e. insufficient production of goods and services or undesirably low employment of people and capital), and (ii) weak inflation, which is to say the purchasing power of money could fall quite a bit before becoming problematic. These challenges have a textbook solution: the government should consume resources (e.g. upgrade airports, build out rural broadband networks) and pay for this with new money rather than borrowing or taxes. This would simultaneously boost growth and raise inflation. The money would come from the central bank, which would either credit the government’s account or hold a government bond in perpetuity. This is not as radical as it sounds: essentially all governments, including the US, operate this way during major wars, and economists including former Fed Chair Ben Bernanke and former Fed Vice Chair Stanley Fischer have offered similar proposals.¹

The simplicity of this approach underscores an important point: if a country can borrow in its own currency, and faces a combination of weak growth and weak inflation, it has an institutional and political problem, not an economic one. But therein lies the rub: these institutional constraints exist because money-financed fiscal expansions can be a slippery slope into fiscal ill-discipline and high inflation. The walls between monetary and fiscal policy are there for a reason.

Therefore, monetary-fiscal coordination requires a governance structure, akin to the rules providing independence and accountability for other central bank actions. These should make clear that money-financed fiscal easing is inappropriate for economies without too-low inflation. And, of course, the approach doesn’t work for countries in a monetary union, such as Italy. But for many other developed market economies, monetary-fiscal coordination may be a solution to persistent macro malaise.

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

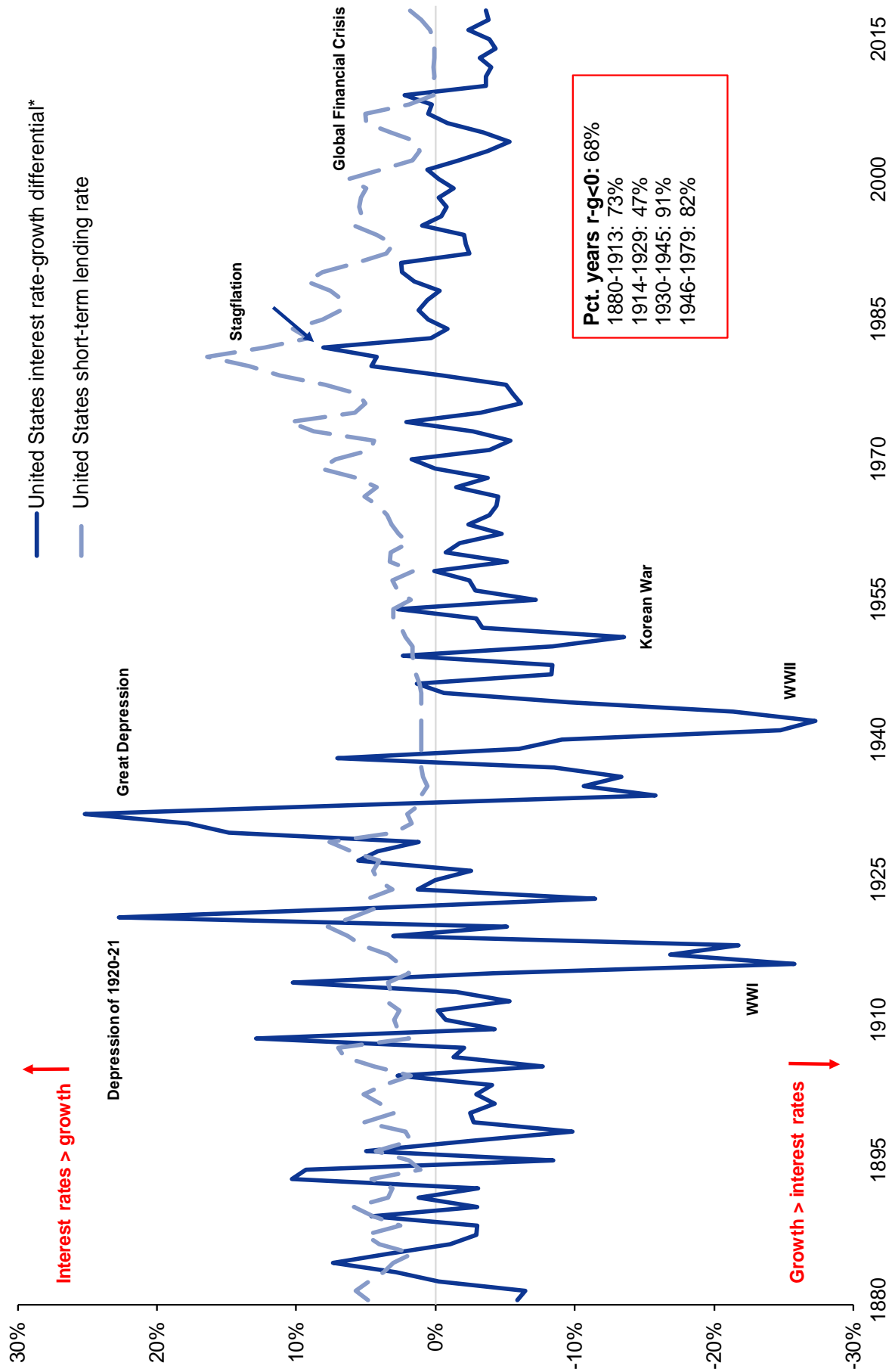
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¹ “What tools does the Fed have left? Part 3: Helicopter money”, Brookings blog post, April 11, 2016; and “Dealing with the next downturn: From

unconventional monetary policy to unprecedented policy coordination”, BlackRock Investment Institute, August 2019.

Long history of interest rates and growth



German fiscal boost: waiting for Godot

Jari Stehn argues that despite a compelling case for fiscal stimulus in Germany today, we can only expect a moderate boost next year

European growth remains weak; although Germany avoided a technical recession in Q3, the Euro area as a whole grew at an annualized pace of 0.8% in Q3. At the same time, area-wide core inflation remains subdued at 1% and measures of long-term inflation expectations are near all-time lows. The ECB returned to monetary easing in September to boost the economy, but former President Draghi acknowledged the limits of monetary policy and stressed that it was now “high time” for fiscal policy to take charge. The new ECB President Christine Lagarde has called explicitly on Germany, as well as the Netherlands, to expand fiscal policy to support growth.

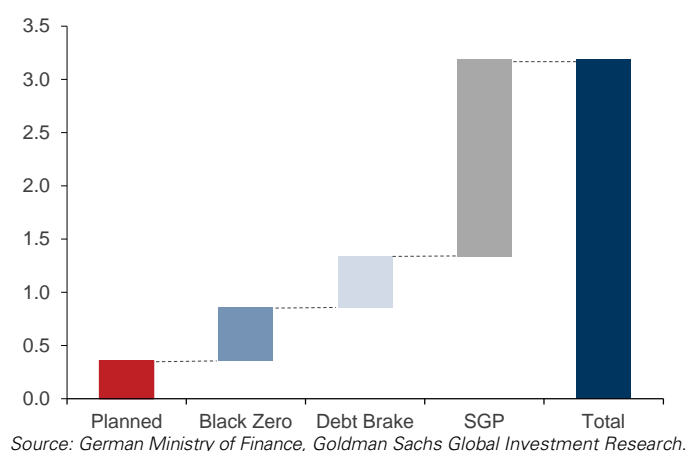
Significant fiscal space

Germany has substantial space to ease fiscal policy, given its budget surplus and the lowest debt-to-GDP ratio among major advanced economies. That said, German budget policy is subject to three constraints: (1) the “black zero” goal (which is a government policy aimed at avoiding deficits), (2) the “debt brake” (which limits deficits over the cycle and is embedded in the constitution) and (3) the EU-wide Stability and Growth Pact (which caps the overall deficit and debt-to-GDP ratio).

Despite these constraints, we estimate that the government could expand fiscal policy by a total of almost 1½% in 2020 within its “debt brake” rule. Beyond that, the government could seek an exception from the debt brake with a simple majority in parliament, which would unlock the significant room Germany has under the Stability and Growth Pact (for a total of around 3% of GDP).

Germany's fiscal framework allows for easier policy

German 2020 fiscal space, % of GDP

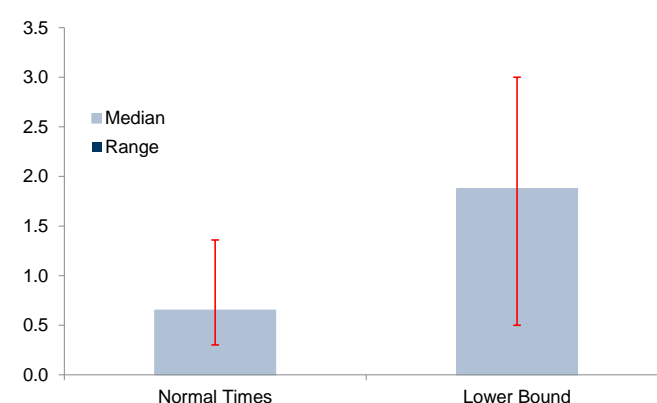


The power of fiscal

Such fiscal stimulus could be quite powerful in the current context. History suggests that the fiscal “multiplier”—the change in output for a given change in spending or taxes that caused it—is actually quite small during normal times.² But the main reason for relatively small fiscal effects during such periods is that expansionary fiscal policy usually pushes up interest rates and thereby “crowds out” private sector spending. Fiscal policy is therefore significantly more effective when monetary policy is constrained by the effective lower bound on interest rates.

Fiscal policy is effective at the lower bound

Estimates of government fiscal spending multiplier



*Note: The estimates are mainly based on the survey by Ramey (2019). Source: Ramey (2019), Goldman Sachs Global Investment Research.

Given stubbornly weak Euro area inflation and low inflation expectations, the ECB is unlikely to respond to a fiscal expansion with tighter monetary policy. We would likewise expect limited upward pressure on long-term rates from a fiscal expansion on core countries, because long-term interest rates tend to respond much less to looser fiscal policy in low-deficit and low-debt economies. Indeed, the IMF estimates that a fiscal expansion of 1% of GDP typically raises 10-year bond yields by around 20bp in countries with high deficits, but only by 7bp in low-deficit economies.³

A moderate boost

Budget plans suggest that Euro area fiscal policy will be somewhat expansionary in 2020. Looking across countries, most of this comes from Germany, but we also see an expansion in France and Italy. Taken together, we expect fiscal policy to boost Euro area growth by 0.3 percentage point (pp) in 2020 and 0.2pp in 2021.

Although this is a sizable growth contribution relative to Europe’s trend growth rate, current budget plans fall short of the boost needed to return the Euro area economy back to trend growth anytime soon, especially in Germany. While the Social Democratic Party—the junior coalition partner in Germany—is likely to increase pressure on the government to increase spending, the coalition has (so far) resisted calls for a

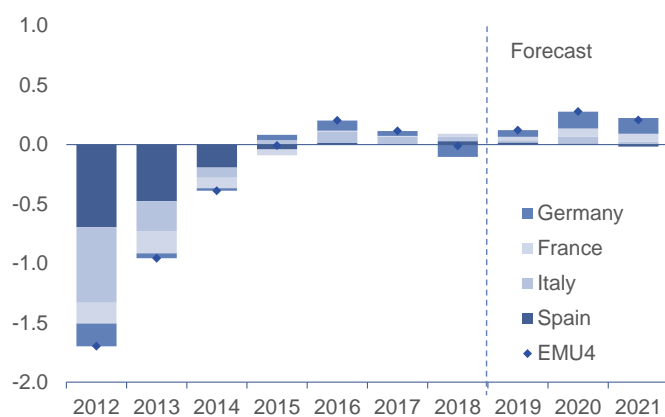
² For a summary, see Valerie Ramey, “Ten Years After the Financial Crisis: What Have We Learned from the Renaissance in Fiscal Research?,” *Journal of Economic Perspectives*, Volume 33(2), Spring 2019.

³ The estimates are taken from Manmohan S. Kumar and Emanuele Baldacci, “Fiscal Deficits, Public Debt, and Sovereign Bond Yields,” IMF Working Paper, August 1, 2010.

sizeable fiscal boost, as a strong fiscal position is seen as vital for coping with the future challenges of demographic and climate change.

A modest expansion in 2020

European fiscal impulses, percentage points of GDP



Source: European Commission, Goldman Sachs Global Investment Research.

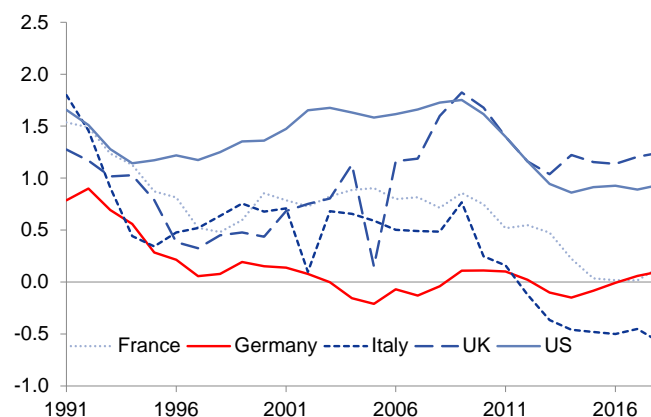
The case for more

A sizable German fiscal expansion should help shield the domestic economy from recession but also have welcome spillover effects on the rest of the Euro area. Germany is a very open economy, with tight trade linkages into other Euro area economies. These trade patterns suggest that stronger German demand would provide the biggest spillovers to countries that most need it (such as Italy) with smaller effects on member states that still see robust growth (such as Spain). This pattern is, of course, no coincidence, as it is precisely through these trade linkages that Germany transmitted weaker global demand to other EMU states.

Moreover, we see a strong case for boosting capital spending given Germany's chronic public underinvestment. Net public investment has been significantly lower as a share of GDP in Germany than in other major advanced economies for the last two decades. This underinvestment has been particularly pronounced at the local government level, where net investment spending has been negative since 2001. Given the persistent underinvestment one would expect that the marginal return on investment is quite high. Boosting public investment would support the economy from a cyclical perspective but also raise long-term potential growth.

Germany has underinvested

Public net capital investment, percent of GDP



Source: ECB, Goldman Sachs Global Investment Research.

Finally, looser German fiscal policy could help enable a more expansionary monetary policy. This is because the ECB's asset purchase program is constrained by the scarcity of German bunds via its self-imposed limits, including the 33% issue/issuer limit and the capital key. Although we see significant headroom at this time, the limits might become binding sooner if Germany's budget surplus is maintained. Extra Bund issuance would therefore allow the ECB to purchase additional sovereign assets, which would provide an extra kick to the area-wide effects of a German fiscal expansion. The benefits are unlikely to be large but could be helpful for the periphery, where QE tends to have bigger effects on long-term interest rates.

Given the government's resistance towards a sizeable fiscal boost, we believe that a further catalyst—such as an outright recession and/or a severe economic shock—would be required to overcome political opposition to an ambitious fiscal package. But our analysis suggests that the economic case for a well-designed package is compelling.

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A turning point for European yields?

George Cole argues that the combination of cyclical stabilization and modest fiscal easing should support European yields next year

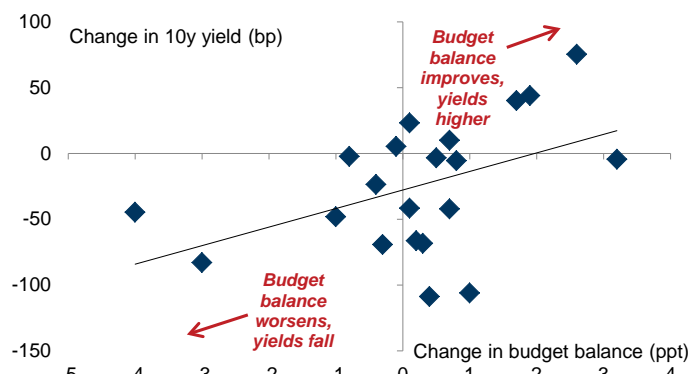
Yields in Europe and the UK hit new all-time lows earlier this year. Growth remains weak and traded inflation remains subdued. But after easing in September, the ECB has called for fiscal policy to take up the reins of cyclical stabilization. Indeed, budgets are loosening across Europe. So is this the turning point for yields? In our view, traded inflation is the key variable to watch—but we think the hurdle for fiscal policy to lead to a material re-pricing higher of inflation risk is high.

The cycle dominates, but the fiscal stance still matters

When trying to understand the relationship between fiscal policy and bond yields, the first point to note is that this relationship is typically dominated by the cycle. Fiscal balances are usually cyclical, with weak cyclical environments associated with higher spending, in large part through automatic stabilizers such as unemployment insurance. This is relevant for Germany, where we think an expansionary fiscal stance that goes beyond the modest expansion within the current budget rules would require further deterioration in activity and employment data. All else equal, expansionary fiscal policy would lead to higher yields; but in periods of cyclical weakness, demand for safe assets typically dominates increased supply, and yields fall.

The cycle dominates in determining yields

Yield sensitivity to changes in general government budget balance



Source: Haver Analytics, Goldman Sachs Global Investment Research.

That said, the fiscal stance undoubtedly matters for yields. Controlling for the cycle, we estimate that a 1pp of GDP expansion of the budget balance should push yields up by 10-25bps.⁴ The impact is smaller for low deficit countries, such as Germany or Switzerland (around 10bp/pp GDP), and larger for higher deficit countries like the US or the UK (around 20bp/pp GDP). Of course, the institutional features of the Euro area further complicate this—without a sovereign currency and national monetary authority, full fiscal flexibility is not available at the national level. The rise in Italian yields in response to 2018’s fiscal expansion was an example of the limitations for unilateral fiscal expansion from Euro area members with weaker fiscal fundamentals.

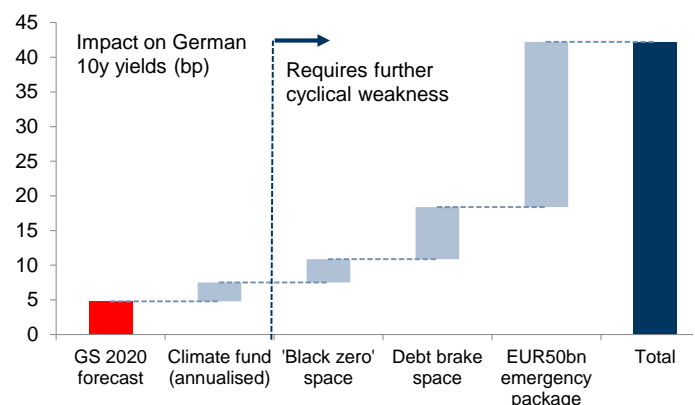
A reason to think this time is different

One reason to expect a smaller increase in yields from fiscal expansion today is the willingness for monetary policy to tolerate, or even encourage, the reflationary effects of fiscal policy. Historically, yield curves would flatten in response to fiscal expansions as monetary policy “leaned against” the inflationary effects of the additional demand through rate hikes, as was the case in the US last year. But the ECB probably won’t feel compelled to temper the impact of a looser fiscal stance on Euro area growth. And even in the UK, where inflation has been higher than in Europe, the BoE is likely to show some tolerance of fiscal policy extending the cycle.

This combination of looser fiscal policy and relatively dovish monetary policy is likely to contain the reaction in nominal interest rates. Because nominal yields are to some degree under the thumb of monetary policy, the litmus test of whether fiscal expansions will truly drive a new reflationary dynamic in the global economy will be market-based measures of inflation, such as inflation swaps or breakeven inflation. Here, we are less confident that inflation markets will respond rapidly to fiscal policy. While the policy mix should be sufficiently inflationary to boost market-based inflation expectations in theory, we do not think a fiscal expansion in Europe, led by Germany, will be large enough to raise inflation expectations meaningfully. Instead, we continue to expect a sizeable budget loosening only *after* data have weakened further.

German stimulus should boost yields moderately

Impact on German 10y yields from potential 2020 loosening



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

Yields may have bottomed, but not just due to fiscal policy

On net, we do not expect fiscal expansion to drive a large rise in German yields and European inflation swaps. Instead, we think the cycle, rather than the effect of additional issuance, will dominate the impact of fiscal policy on European yields. That said, given the proximity of the lower bound in Europe, the prospect for cyclical stabilization and the direction of fiscal policy, we see risks as tilted towards higher bund yields versus both other European sovereign bonds and US Treasuries. In the UK, we expect a steeper curve as fiscal policy and an eventual reduction in Brexit risks drives up Gilt yields.

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⁴ We follow the approach of Baldacci and Kumar (2010).

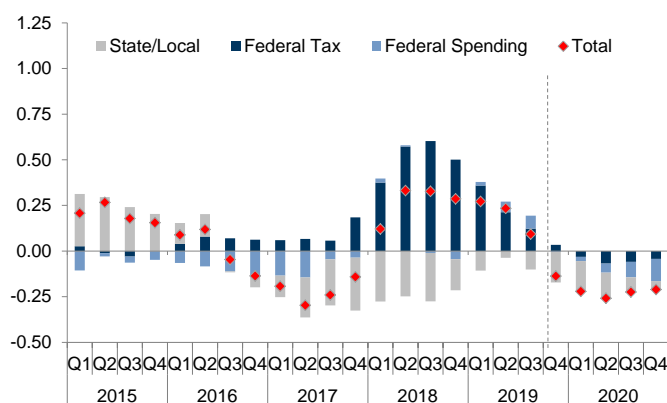
US fiscal policy: on hold through 2020

Alec Phillips argues that the impact of US fiscal policy on growth should turn slightly negative next year, but the 2020 election could be meaningful for the fiscal outlook

Fiscal policy boosted US growth in 2018 and 2019, but we expect the effect to fade to slightly negative by 2020. Over the past two years, Congress enacted two substantial policy changes. First, the Tax Cut and Jobs Act (TCJA) boosted growth, we estimate, by around 0.6pp in 2018 and 0.2pp in 2019 (on a Q4/Q4 basis). Second, the spending deal enacted in August, which lifted the caps that Congress had previously imposed on discretionary spending for FY2020 and FY2021, should allow spending to rise slightly in real terms. We expect both of these positive impulses to fade to roughly neutral by the end of 2019, and to turn slightly negative in 2020.

From boost to drag

Effect of fiscal policy on real GDP growth, percentage points (3Q centered moving average)



Source: CBO, Treasury, Goldman Sachs Global Investment Research.

Low likelihood of pre-election changes

Substantial fiscal policy changes are unlikely before the election. While some minor changes are possible, such as the extension of a number of expired and expiring corporate tax provisions, major changes seem out of reach in light of the divided Congress and the upcoming election.

That said, an upcoming congressional spending deadline poses two minor risks. Congress recently passed an extension of spending authority to December 20, at which point it will need to pass further legislation to provide continued spending authority to the federal government and avoid a partial government shutdown. At this stage, there is no reason to believe that the risk of a shutdown is much greater than usual, but the upcoming election, ongoing impeachment proceedings, and continued disagreement on immigration policy and other issues suggest at least some risk of a shutdown. A less important downside risk is that spending authority could be extended for the full fiscal year at the prior year's levels (i.e., a full-year "continuing resolution"), which would reduce spending growth in 2020.

The White House might also unveil new pre-election fiscal proposals. We expect the White House to propose a tax cut aimed at middle-income individuals in early 2020. In our view, there is virtually no chance that such a proposal could pass a

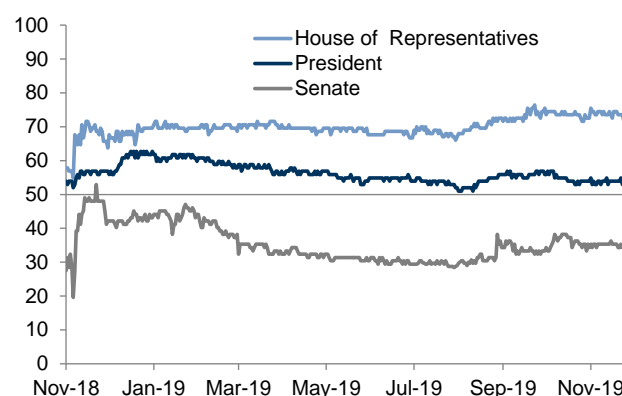
divided Congress in an election year—at least, not unless there is a substantial downturn in the economy, which we do not forecast. But such a proposal could nevertheless affect the presidential debate and focus financial market participants more clearly on the prospects for post-election fiscal stimulus.

Watch the 2020 election

More importantly, the 2020 presidential election will likely have meaningful implications for fiscal policy. Assuming that the House remains under Democratic control, as is widely anticipated by most independent political analysts, the main variables are control of the White House and the Senate.

Implied odds of House, Senate, and White House control

Prediction market implied-probabilities of Democratic control, percent



Source: PredictIt, Goldman Sachs Global Investment Research.

If Democrats win the White House and a narrow Senate majority, we would expect them to use the "reconciliation" process to pass tax and health care legislation. In light of campaign proposals, this would likely involve a net increase in corporate taxes, and a redistribution of tax liabilities from lower to higher income taxpayers.

A Democratic White House and congressional majority would also likely pursue an expansion of health insurance coverage. While we believe that Congress is unlikely to pass a full-fledged "Medicare for all" bill regardless of the election outcome, a unified Democratic government could establish a federal insurance program (the "public option") along with expanded ACA-style subsidies. In such a scenario, we would expect that Congress would offset the cost of such a program with other spending cuts or tax increases. However, the impact on the deficit over the next few years is difficult to predict, since the new spending might ramp up faster than the savings provisions used to offset the cost.

By contrast, if President Trump wins reelection—and assuming Congress remains divided—fiscal policy changes would likely be more incremental. President Trump might revive his effort to pass a new infrastructure program, a potentially bipartisan agenda item left from the first term. Earlier this year, President Trump was [reported](#) to be considering spending cuts as a second-term priority, but these could face a challenge in a divided Congress, particularly in light of the fact that neither party appears to be particularly focused on the budget deficit at the moment.

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Fiscal policy in Asia: constrained support

Andrew Tilton and Naohiko Baba argue that fiscal policy will be relatively constrained in China and Japan as authorities focus on financial vulnerabilities and debt consolidation, respectively

Asia's two largest economies are both running below potential, with Japan at risk of contraction this quarter and China's sequential growth likely well below 6%. Both economies should see at least a mild pickup in sequential growth over the first half of 2020 (though given the weak starting point, we expect annual average growth to be lower in both countries in 2020 than 2019).

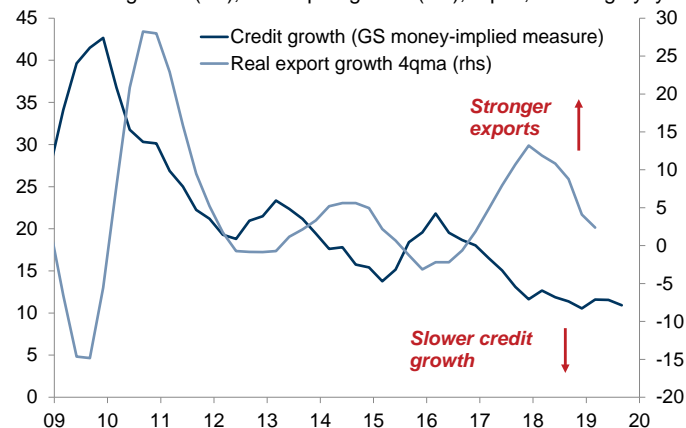
Fiscal policy shifts have played an important role in recent growth outcomes in both countries. China has employed expansionary fiscal policy to cushion the blow of weaker export growth amid the US-China trade conflict and soft global growth. Fiscal policy will likely loosen further in 2020, but in a more restrained manner given an already-large deficit and more cautious policy approach. In Japan's case, a fiscal contraction—implemented to try to put government finances on a more sustainable path—has compounded the effects of weak global activity. In neither country do we expect a large-scale easing that would mark an attempt to push growth above potential.

China: more fiscal stimulus, but more cautious approach

In China, quasi-fiscal policy has been a key element of counter-cyclical economic management for many years (see pg 18). Many fiscal measures are implemented by local governments, and often involve significant infrastructure outlays as well as other spending measures and tax cuts. The involvement of state-owned banks (to provide the needed credit) and enterprises as well as local governments (to directly implement spending) has historically enabled quite rapid implementation when external conditions deteriorate. However, in recent years, the higher level of indebtedness of local governments—and consequently greater focus on fiscal discipline and project returns—has arguably complicated the incentives for local officials and may have slowed the transmission of fiscal policy.

Domestic easing is typically employed when exports flag

China credit growth (lhs); real export growth (rhs), 4qma, % change yoy



Source: Goldman Sachs Global Investment Research.

In any case, China's broader macroeconomic policy is undergoing a shift, in our view, towards a more conservative and

reactive approach that involves doing the minimum stimulus required to avoid a sharp slowdown. Arguably, this shift was signaled as far back as 2016 by public comments from an unidentified "authoritative person" (widely thought to be President Xi's chief economic advisor Liu He). Persistent and largely successful efforts to contain capital outflows, crack down on metastasizing shadow banking activities, and restrain runaway home price appreciation followed. These contributed to a slowdown in the economy since early last year. But policy also tightened in the past when growth looked stronger, so it is only now that growth has slowed that the [new policy reaction function](#) is fully evident: policymakers have reacted, but eschewed the type of aggressive easing delivered in the past. With the leadership firmly in place, we think policymakers are "playing the long game"—they will continue to react to any signs of a sharp slowdown but will otherwise focus on risk controls to preserve policy space for tougher times.

Chinese macro policy has been less supportive in this cycle

China domestic macro policy proxy, z-score



Note: Shaded areas refer to periods when China CAI growth was below 6%.

Source: Goldman Sachs Global Investment Research.

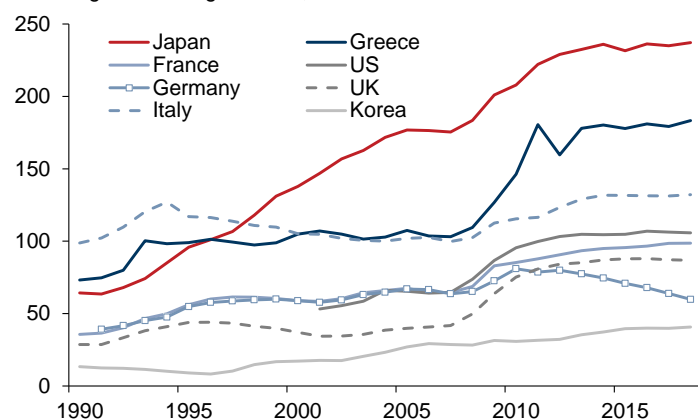
What does this mean for policy in 2020? Given soft global growth and the still-uncertain trade outcome with the United States, it would be premature for policymakers to count on a big external boost to growth. And domestic activity remains quite soft. As we noted in our [2020 China outlook](#), domestic demand has grown only 5.4% over the past year on official data; only a sharp reduction in imports (and hence a positive net export contribution to growth) has kept the overall growth pace from falling below the 6-6.5% target range for 2019. Under these conditions, some policy support will still be required; but as noted above, it will likely remain restrained in the absence of even weaker data. With policymakers [unwilling to ease significantly in the housing sector](#), and wary of exacerbating money/credit excesses, fiscal policy will need to do most of the heavy lifting. We expect the "augmented fiscal deficit"—that includes off-budget activities on top of the official deficit—to widen another ¾ pp in 2020, after a roughly 2pp widening this year. This is likely to be front-loaded within 2020 (and indeed, some of the increase in special bond issuance will reportedly be pulled into late 2019).

Japan: contractionary fiscal policy in train

Japan faces tighter fiscal constraints than China, indeed some of the tightest in the world. Government debt has surged to global highs since the bursting of the 1980s asset bubble. Nominal growth is sluggish, at an average of slightly over 1% over the past decade. And the demographic challenge of a shrinking and aging population will place further strain on fiscal resources in coming years.

Japanese government debt at a global high

General government gross debt, % of GDP

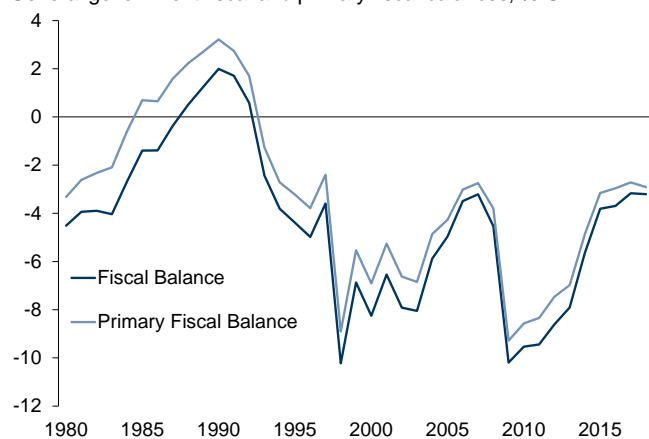


Source: IMF, Goldman Sachs Global Investment Research.

Under these conditions, policymakers—particularly at the Ministry of Finance—are keen to reduce the fiscal deficit, which remains significant despite improved growth and very low interest rates in recent years). Indeed, Japan's situation is arguably one of "fiscal dominance," where the high level of debt and the need for consolidation will [require ultra-low rates for a sustained period](#). In a bid to fill the gap further, the government has raised the national consumption tax higher in several stages, the fourth of which was just implemented on October 1. This tightening in fiscal policy will likely contribute to weak activity in Q4 2019 and early 2020, and we expect full-year real GDP growth to fall from 0.9% in 2019 to 0.4% in 2020 (see our just-released [2020 outlook](#) for more details.)

Japan's fiscal deficit has narrowed, but remains significant

General government fiscal and primary fiscal balances, % GDP



Source: IMF, Goldman Sachs Global Investment Research.

Despite these challenges, monetary policy space is even more constrained than fiscal policy. The policy rate is negative—further cuts would mean moving deeper into negative territory and perhaps below the theoretical "[reversal rate](#)" at which easing is counterproductive. Long-term rates are pinned near zero with "yield curve control." The resultant flattened yield curve has [created an adverse situation for lifers and pension funds](#). The Bank of Japan has engaged in large-scale QE, including equity ETF purchases, for years. Forward guidance is also quite dovish, suggesting the BOJ will maintain the expansion of the monetary base (though not necessarily yield curve control or a negative policy rate) until CPI inflation exceeds the 2% target. Given the challenges to easing monetary policy further at this point, fiscal policy is sometimes used temporarily as a countercyclical tool despite its own constraints.

The current situation is one in which the structural trend of gradual fiscal tightening intersects with weak cyclical momentum. Also, the third tax hike, a 3% increase in April 2014, was preceded by significant "front-loading" in consumer spending, followed by substantial "payback" and a prolonged malaise given weaker real incomes. Amid fears of a similar outcome, Prime Minister Abe had delayed the fourth hike twice already. To ameliorate the impact, this tax hike was smaller (2%), with more exemptions (food in particular), and coupled with various fiscal measures (including free preschool education) that reduced other expenses for households. As a result, the disruptions to short-term activity appear likely to be only one-third as large as those experienced in 2014. We expect Q4 to be the weakest quarter on a sequential basis, with gradual improvement in the coming year as the "payback" effects fade and fiscal measures/Olympics-related spending activity support the economy through mid-2020.

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China's fiscal policy: how is it different?

In China, the type of fiscal tools employed by policymakers and the way they impact the economy differs from other countries. As a general matter, fiscal tools are broader in China. For example, in addition to the tax cuts and discretionary spending governments typically employ, the Chinese government frequently uses infrastructure investment to stabilize growth (e.g., during the global financial crisis and the slowdown since the middle of last year). In this sense, infrastructure investment is an important form of state-driven discretionary spending in China (i.e., quasi-fiscal policy), although it's financed in large part via off-budget sources. Additionally, fiscal policy in China is highly decentralized. Local governments implement around 85% of on-budget spending, and entities closely connected with local governments—such as Local Government Financing Vehicles (LGFV)—implement almost all off-budget spending. We describe four key features of Chinese fiscal policy below.

Feature 1: Off-budget policy is important

Since China's official fiscal balance doesn't reflect all government activity affecting the aggregate economy, we've created an "augmented" fiscal balance indicator that includes off-budget activities in order to get a timelier and more comprehensive picture of total government fiscal spending (the concept is derived from a similar measure from the IMF). We estimate off-budget spending by looking at the major channels through which quasi-fiscal activities are financed. This includes new local government special bonds, land sales revenue, LGFV bonds, policy bank support, shadow banking loans, and the special construction fund. Adding the estimated off-budget spending to the on-budget balance provides the augmented fiscal balance. This measure shows that most of the fiscal deficit in China is off-budget, and that the government has loosened fiscal policy notably since mid-2018, when growth began to face significant domestic and external headwinds.

Feature 2: High interdependence between fiscal and monetary policy

The State Council (or Central Committee on Finance and Economy) largely decides the policy mix in China, with the Ministry of Finance (on-budget fiscal policy), central bank (monetary policy), and National Development and Reform Committee (approval of infrastructure projects) mainly responsible for policy execution. China's institutional architecture dictates a certain level of interdependence between fiscal policy and monetary policy. This interdependence is most clearly reflected in the context of infrastructure investment, which involves close coordination between many different entities (e.g., NDRC for project assessments, MOF for on-budget support, PBOC and CBRC for financing support, local governments for implementation). As a result, monetary policy is required to ensure credit growth and interest rates are at appropriate levels to support increased infrastructure investment and to mitigate potential crowding-out effects.

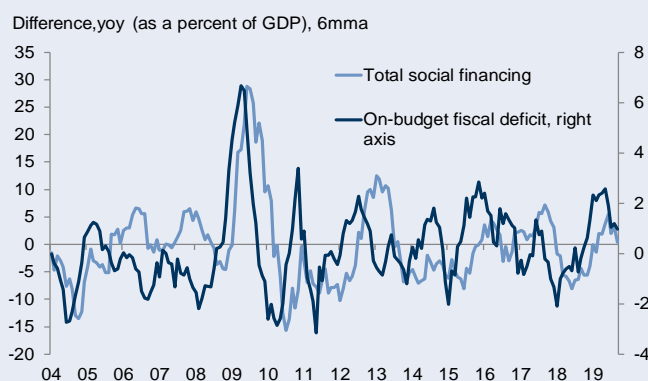
Feature 3: More effective fiscal policy, but weaker monetary transmission

China still has a large state-run sector, including state-controlled banks, other state-owned enterprises (SOEs), and LGFVs, which are the major institutions involved in infrastructure investment. The large role of SOEs leaves the traditional channel of monetary policy transmission less effective in China, as these entities are less sensitive to interest rates. Bank capital constraints and high risk aversion also limit the effectiveness of monetary policy. But the ability of SOEs to provide financing for infrastructure investment at the government's direction essentially leaves fiscal policy more effective and direct. Indeed, China's state-backed entities essentially facilitate a "fiscal channel" for monetary policy by increasing infrastructure financing on the back of policy easing. That said, the incentives of local governments and the banking sector also play a role in the level of investment. For example, the 2013-2015 anti-corruption campaign discouraged local officials from quickly implementing infrastructure projects in the 2015 easing cycle.

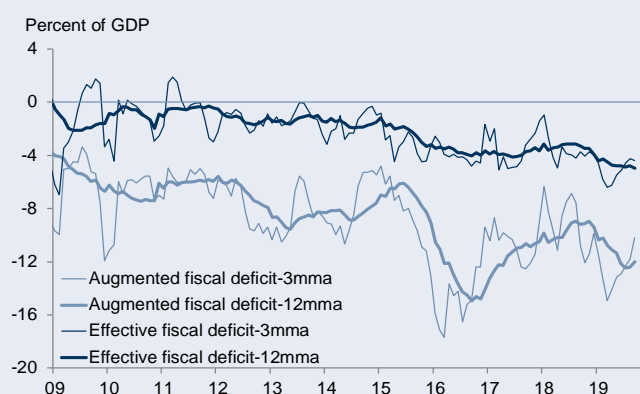
Feature 4: Fiscal measures drive the credit cycle

In countries like the US, financial conditions tend to lead the economic cycle. In China, however, fiscal policy tends to drive the credit cycle, given the large state sector and centrality of fiscal policy in countercyclical policy management. In other words, when growth slows, on-budget fiscal policy typically reacts first, followed by monetary easing to accommodate increased infrastructure investment. During a downturn, infrastructure investment becomes the driving force behind the credit cycle because private sector credit demand tends to be weak.

China's augmented and effective fiscal deficits are sizable



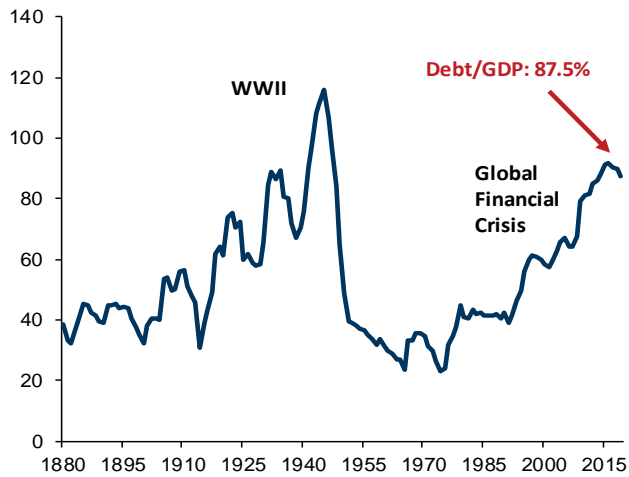
Fiscal stimulus leads broader credit expansion in China



Zhennan Li and Hui Shan, GS China Economics Research

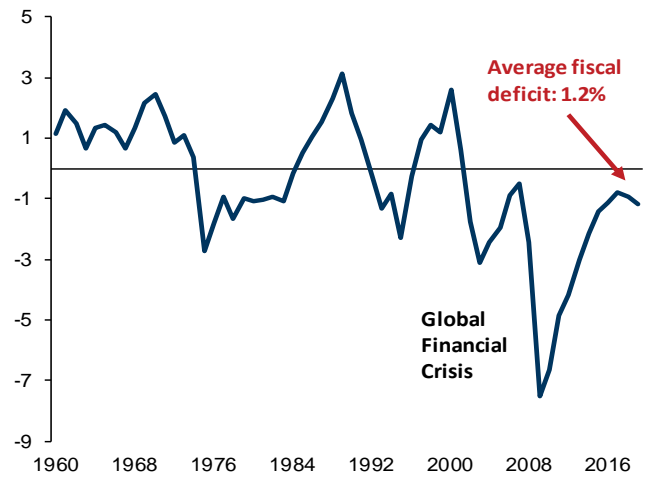
Debt: less costly with low interest rates?

Advanced economy government debt is near all-time highs
Average debt-to-GDP in advanced economies*, % GDP



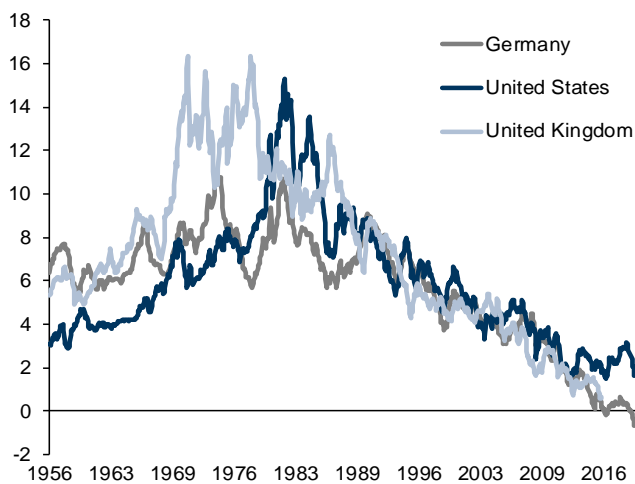
*Note: includes Australia, Canada, France, Germany, Italy, Japan, Korea, the UK, and the US.
Source: IMF, Goldman Sachs Global Investment Research.

But fiscal deficits have mostly recovered to pre-crisis levels
Average deficits in advanced economies*, % of GDP



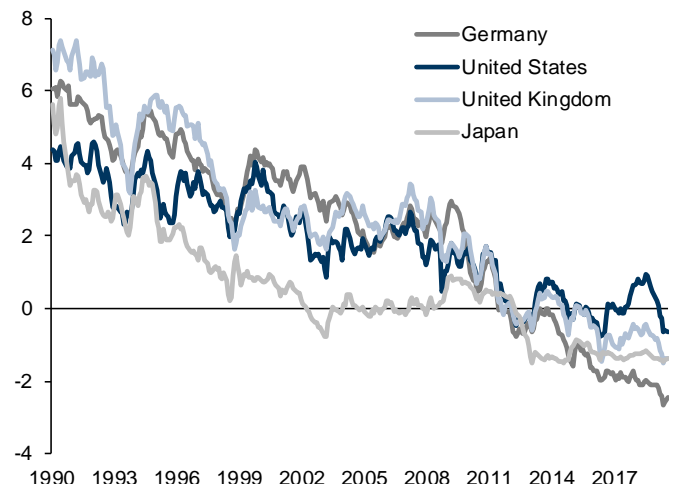
*Note: primary balance as % of GDP; includes Germany, Japan, the UK, and US.
Source: IMF, Goldman Sachs Global Investment Research.

At the same time, long-term interest rates have fallen
Long-term nominal interest rates, percent



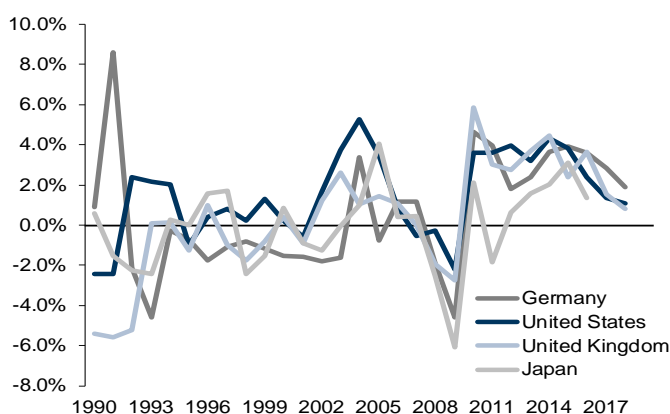
Source: OECD, Goldman Sachs Global Investment Research.

And real rates are negative in most advanced economies
Long-term real interest rates*, percent



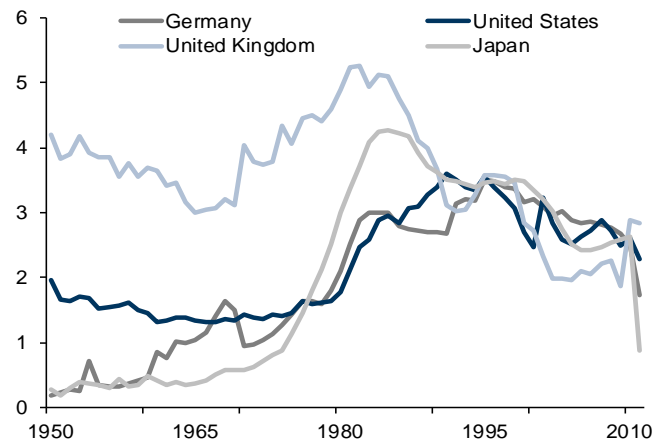
*10-year government bond yield deflated by 10-year ahead expected inflation.
Source: Bruegel (2019), Goldman Sachs Global Investment Research.

Growth is now higher than interest rates in many countries
Interest-growth rate differential*, percent



*Note: Nominal interest rate minus nominal growth rate.
Source: Jordà, Schularick, Taylor (2017), Goldman Sachs Global Investment Research.

The cost of public debt has come down as a result
Interest paid on public debt, % of GDP



Source: IMF, Goldman Sachs Global Investment Research.

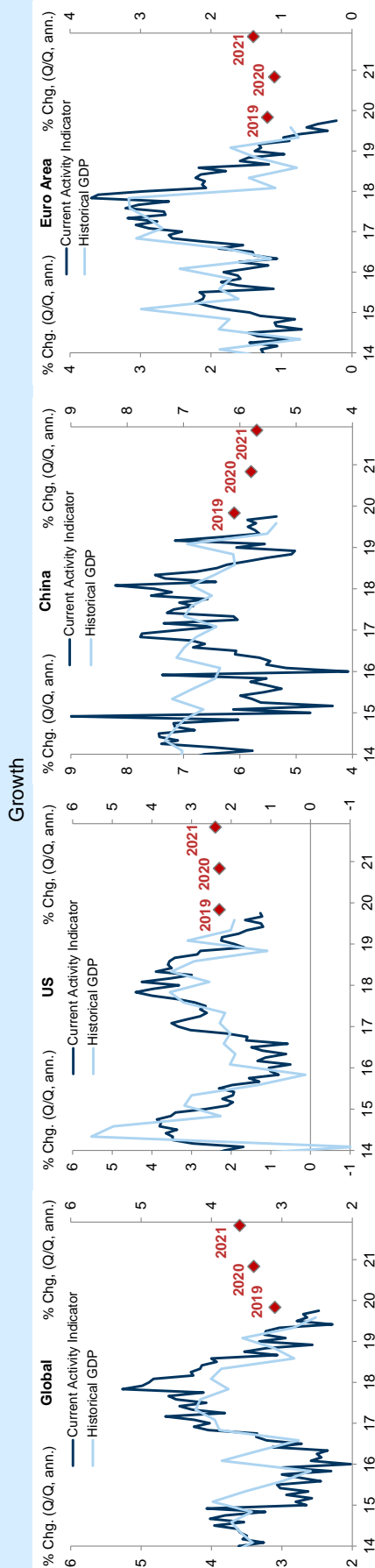
Summary of our key forecasts

GS GIR: Macro at a glance

Watching

- **Globally, we expect growth to pick up** to 3.4% in 2020 from 3.1% in 2019, in response to easier financial conditions and an end to trade escalation. We're most confident that sequential growth will improve in the US and UK next year, on the back of easier financial conditions and a resolution of Brexit, respectively, and also expect a gradual improvement in the Euro area and Japan.
- **In the US**, we expect growth to rise from the current 1.75% sequential pace to the 2.25 – 2.5% range in 2020, owing to a housing recovery, strength in consumer spending, and a fading drag from the inventory cycle. We estimate the probability of recession in the next 12 months is 20%. We expect core PCE inflation to rise from current levels to 2.0% by Q4 2020.
- **We expect the Fed will stay on hold through 2020** given our forecast of slightly above-trend growth and 2% inflation, though we see risks to our call as skewed to the downside as the Fed continues its policy framework discussion on potentially allowing for slightly higher inflation.
- **In the Euro area**, we expect a gradual pickup in annualized growth from its current pace of 0.2% to a slightly-above trend 1.1% in 2020, driven by stabilization in the manufacturing sector, a modest fiscal impulse, and a resolution of Brexit uncertainty. We maintain that the passage of a Brexit deal after the general election and before the January deadline remains the most likely Brexit outcome.
- **We think the ECB will maintain its EUR 20bn/month QE program until end-2021** in the face of weak growth and low inflation, but we don't expect additional rate cuts in 2020.
- **In China**, we expect full-year GDP growth to slow from 6.1% in 2019 to 5.8% in 2020 as policymakers focus on boosting the quality of growth and limiting overall leverage.
- **WATCH TRADE**. We think US tariffs on imports from China have peaked, and expect a partial rollback of tariffs as part of a "Phase 1" trade deal. At the same time, we think the chances of a tariff increase have also risen. We see the odds that the US imposes tariffs on EU auto imports as quite low, and expect the US-Mexico-Canada trade agreement (USMCA) will become law in early 2020.

Source: Goldman Sachs Global Investment Research.



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	GDP growth (%)			Interest rates 10Yr (%)			Markets			Equities									
	2019	2020	2020	Last	E2019	E2020	FX	Last	3m	12m	S&P 500	E2019	E2020	Returns (%)	12m	YTD	E2019 P/E		
Global	3.1	3.1	3.4	3.1	1.76	1.90	2.25	EUR/\$	1.10	1.11	1.15	Price	3,100	3,400	--	S&P500	27.3	19.3x	
US	2.3	2.3	2.3	1.8	-0.35	-0.15	0.00	GBP/\$	1.29	1.35	1.37	EPS	\$167	\$177	\$179	MXAPJ	6.0	13.5	15.0x
China	6.1	6.1	5.8	5.8	-0.09	-0.05	0.10	\$/JPY	109	110	105	Growth	3%	1%	6%	Topix	6.0	16.9	14.7
Euro area	1.2	1.1	1.1	1.0	0.60	0.95	1.20	\$/CNY	7.02	6.85	6.90	Credit (bp)				STOXX 600	3.0	20.7	15.8
Policy rates (%)	2020			Commodities			Consumer			E2020			Wage Tracker 2019 (%)						
	GS	Mkt.	Mkt.	Last	3m	12m	Last	E2019	E2020	Last	E2020	CPI	Unemp. Rate	Q1	Q2	Q3			
US	1.63	1.45	1.63	2.5	2.5	2.5	Nat Gas (\$/mmBtu)	IG	106	108	115	US	3.7	2.0	3.3	3.0	3.4	3.3	
Euro area	-0.50	-0.54	-0.50	63.7	62	60	Crude Oil, Brent (\$/bbl)	HY	376	342	365	Euro area	1.2	7.6	0.9	7.5	2.4	2.2	--
China	2.60	2.44	2.50	5.851	6,000	7,000	Copper (\$/mt)	IG	117	112	119	China	2.9	--	3.6	7.0	7.0	7.0	
Japan	-0.10	-0.09	-0.10	1,468	1,575	1,600	Gold (\$/troy oz)	HY	359	336	357	Japan	--	--	--	--	--	--	

Source: Bloomberg, Goldman Sachs Global Investment Research. For important disclosures, see the Disclosure Appendix or go to www.gs.com/research/hedge.html.

As of Nov 25 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.

Real-Time Indicator of Activity (RETINA)

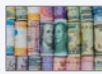
GS RETINA uses a comprehensive econometric methodology to filter incoming information from the most up-to-date high-frequency variables in order to track real GDP growth in the Euro area and the UK.

For more, see [European Economics Analyst: RETINA Redux, 14 July 2016](#) and [European Economics Analyst: Introducing RETINA-UK, 2 August 2017](#).

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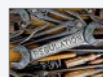
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Disclosure Appendix

Reg AC

We, Allison Nathan, Gabe Lipton Galbraith, Naohiko Baba, George Cole, Jan Hatzius, Zhennan Li, Zach Pandl, Alec Phillips, Hui Shan, Jari Stehn, 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.

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