

# TOP *of* MIND

## DAUNTING DEBT DYNAMICS



Government deficits, debt issuance and debt levels are set to surge as countries race to ease the economic impact of the coronacrisis. This raises many questions: who will finance this debt, will it force a market repricing and/or an eventual growth or inflation problem, and would greater use of negative rates help avoid any of these risks? At the same time, whether corporate bankruptcies could derail the economic recovery is a key concern. In short, how disruptive the recent, dramatic shift in debt dynamics might be is Top of Mind. We consult Harvard Professor Kenneth Rogoff, University of Pennsylvania's David Skeel, and GS's own Jan Hatzius, Praveen Korapaty and Sylvia Yeh on these questions. Our key takeaways: the benefit of

running large deficits today far outweighs any eventual costs; DM bond yields are likely to rise modestly as a result; worries about distress in EMs are largely warranted, in munis are mostly not, and in the Euro area are somewhere in between; and a likely wave of corporate bankruptcies could prolong—but likely won't derail—the economic recovery.



Rising debt is not desirable and is not a free lunch, even with very low interest rates; that view is just wrong... But that doesn't mean we shouldn't be buying lunch for everyone right now. We should be doing so.

- Kenneth Rogoff

In the current environment of exceptionally weak demand and economic activity, running large government deficits won't be inflationary, and is not a reason to worry about a debt crisis, at least in countries like the US, UK, Japan... And it's definitely not a reason to worry about a growth drag.

- Jan Hatzius

I wouldn't be surprised if [bankruptcy] filings increase a lot more than they did during the Global Financial Crisis, when they essentially doubled.

- David Skeel



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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

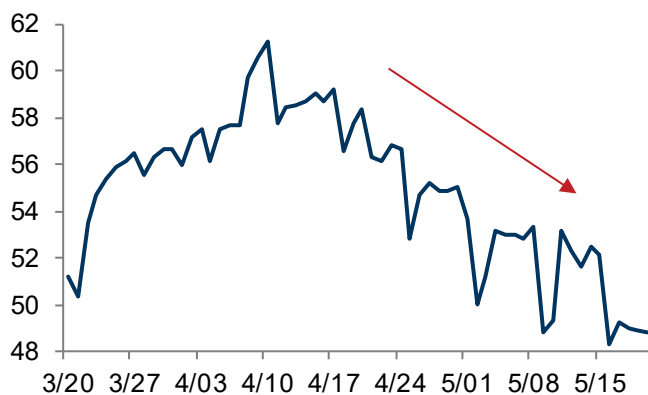
- We now expect GDP to decline at a quarterly annualized rate of 39% in Q2 and by 6.3% in 2020 as a whole.
- We now see unemployment peaking at 25% by the end of Q2—a much larger spike than in other DMs.

### Datapoints/trends we're focused on

- The gradual normalization of activity and state of virus spread as reopening continues, albeit modestly so far.
- Export volumes, which we estimate worsened further in April and early May following the sharp drop in March.
- A rise in public and consumer debt as the crisis continues.

### Lockdowns eased modestly over the past month

GS US Effective Lockdown Index, index



Source: Oxford, Google Mobility Report, Apple Mobility Trends, GS GIR.

## Japan

### Latest GS proprietary datapoints/major changes in views

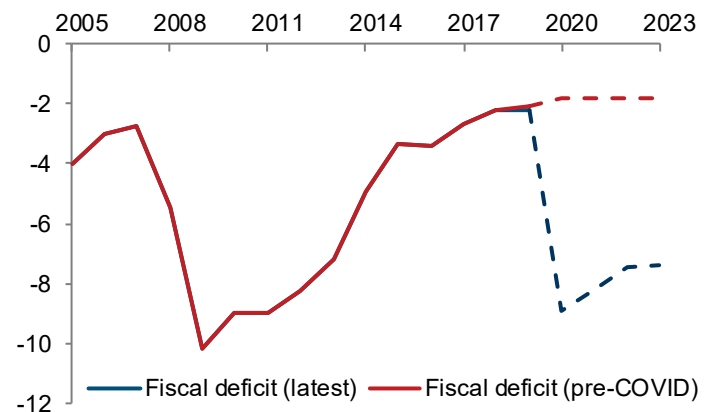
- We've raised our annual real GDP forecast for FY2020 to -6.4% based on stronger-than-expected Q1 GDP data.

### Datapoints/trends we're focused on

- Second supplementary budget, which we expect will have a limited impact on FY2020 GDP despite a large headline figure.
- Fiscal stress; we forecast deterioration in the FY2020 fiscal deficit will be the worst in over six decades.
- BOJ pressures; we think a rising fiscal deficit and sharp drop in GDP will make it far more difficult for the BOJ to normalize interest rates going forward.

### Deficit forecast sharply downgraded due to COVID-19

Fiscal balance forecast, % of GDP



Source: MOF, Cabinet Office, Goldman Sachs Global Investment Research.

## Europe

### Latest GS proprietary datapoints/major changes in views

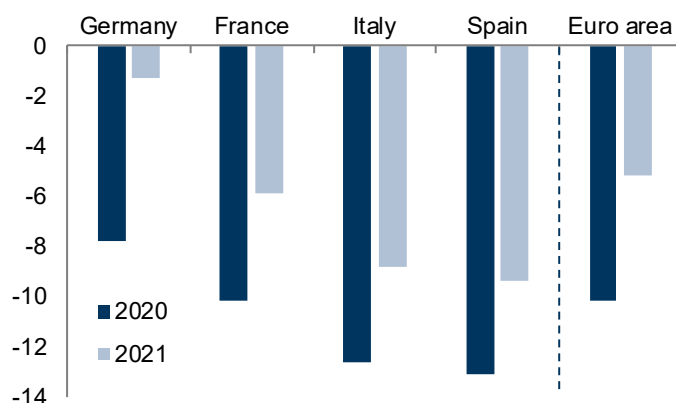
- We now expect 2020 Euro area GDP of -11.2%, with a faster recovery expected in Germany than in France, Spain and Italy.
- We believe the EC's proposal for a EUR 750bn Recovery Fund raises the likelihood of further fiscal integration, although we don't expect the fund to be operational until 2021.

### Datapoints/trends we're focused on

- The June ECB meeting; we still expect the PEPP to be upsized, but see it as a close call.
- Fiscal stress; we expect budget deficits to rise to ~13% of GDP in Italy/Spain, ~10% in France and ~8% in Germany.

### We expect unprecedented Euro area budget deficits

Government budget balances, % of GDP



Source: Goldman Sachs Global Investment Research.

## Emerging Markets (EM)

### Latest GS proprietary datapoints/major changes in views

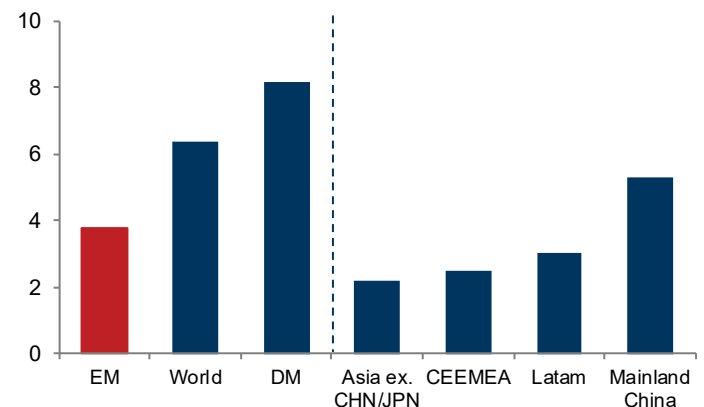
- We've reduced our full-year GDP forecast to -7.6% for LatAm in 2020 and to -5% for India in FY21 on the back of weak data and deeper virus impacts.
- On news from the NPC, we've slightly raised our forecast of China's 2020 augmented fiscal deficit to 17% of GDP.

### Datapoints/trends we're focused on

- Rising US-China tensions, which have expanded in scope.
- EM local debt issuance; we think that the "DMs of EM" face the lowest risks from a surge in government debt among EMs.
- EM fiscal stimulus, which we expect to be less aggressive than in DMs, at 3-4% of GDP.

### EM fiscal easing will be less aggressive than DM

Fiscal easing in response to coronavirus, % of GDP



Source: Goldman Sachs Global Investment Research.

# Daunting debt dynamics

A surge in government deficits to ease the economic impact of the coronacrisis has led to an explosion of sovereign debt issuance and eye-popping projections for public debt increases at the country, state/provincial and local levels. Indeed, we expect debt-to-GDP ratios in Developed Markets (DM) to match levels last seen during WWII, and in Emerging Markets (EM) to reach their highest level in history, with several countries and municipalities within both facing intense financial strains.

This debt surge raises many questions: Who will finance it? Will it force a market repricing, or even severe market dislocations in places like the Euro area, some EM countries, or US municipalities where debt dynamics look particularly unsustainable? Even if material market disruptions don't occur, will such indebtedness ultimately lead to a growth or inflation problem? And would greater use of negative rates—the topic du jour for central banks—help avoid these risks? At the same time, whether private sector debt issues will lead to a wave of corporate defaults/bankruptcies that could derail the economic recovery is a key worry. In short, how disruptive the recent, dramatic shift in debt dynamics might be for markets and the economy is Top of Mind.

To begin to answer these questions, we first turn to Kenneth Rogoff, Harvard professor and former Chief Economist at the IMF, as well as Jan Hatzius, GS Head of Global Investment Research and Chief Economist. They agree that the sharp rise in deficits/debt levels to support growth is absolutely warranted today given the magnitude of the economic challenges we're facing, which dwarf any concerns about a future debt-related drag on growth. Rogoff, in particular, doesn't expect economic activity to return to pre-virus levels for as long as five years. And they both see little reason to be concerned about rising inflation anytime soon. But Rogoff emphasizes that high deficits and debt levels are nevertheless not a free lunch even with today's low interest rates, and markets are going too far in expecting that real rates and inflation will never rise.

And both Rogoff and Hatzius see reasons to worry about debt dynamics in the Euro area and EM countries. Specifically, Rogoff believes that EMs are facing their most challenging conditions since the 1930s, and expects numerous EM sovereign defaults ahead. Indeed, GS economists Kevin Daly, Clemens Grafe and Tadas Gedminas detail the difficult future adjustments needed for many EM economies.

As for negative rates, both Rogoff and Hatzius see a very low likelihood of a shift to them in the US anytime soon. But Hatzius isn't convinced that such a shift would help the economic recovery much in any case since the Fed would have to pursue them slowly. Rogoff, for his part, remains an ardent supporter of deeply negative rates, which he argues would provide a powerful boost to the economy without the feared negative consequences for banks or savers, as long as central banks prevent cash hoarding among financial institutions.

With all that in mind, we then sit down with Praveen Korapaty, GS Chief Interest Rates Strategist, to discuss who will likely absorb the surge in DM issuance, and the potential impact on DM yields. In his view, while the Fed will likely be the biggest buyer of the \$4tn in US issuance that he expects in the current fiscal year, market participants will need to absorb roughly a

third of it. But he thinks only a relatively modest (10-20bps) rise in yields will be required to see this issuance absorbed, in line with his view of moderately higher yields and a steeper Treasury yield curve over the next 6-12 months.

In the Euro area, however, Korapaty believes that the ECB will likely need to upsize its purchases to keep up with the scale of increased issuance and growing deficits. But whether the ECB will have the legal/political leeway to do so remains in doubt, reinforcing concerns about debt sustainability in the region. Indeed, GS Europe economist Christian Schnittker estimates a 35% chance that Italy ends up with an unsustainable debt path over the next decade. Given these concerns, both Korapaty and GS Head of European Rates Strategy, George Cole, don't expect peripheral spreads to sustain a return to pre-virus levels in the near term. But they do think that the ECB and Euro area fiscal authorities will continue to do enough to keep peripheral spreads from blowing out, with recent progress on the Recovery Fund that will provide support to the most stressed economies a step in the right direction.

GS EM strategists Kamakshya Trivedi and Davide Crosilla similarly assess the ease with which the surge in EM government local debt issuance will likely be absorbed, ranging from countries where risks to yields from the rise in issuance are low (such as South Korea and Israel), to those where it is high, (such as Turkey and frontier economies).

We then drill down below the country level, asking Sylvia Yeh, co-head of Goldman Sachs Asset Management's Municipal Fixed Income business, how concerned we should be about stress in the US municipal bond markets. Her short answer: while there are certainly areas of municipal distress, the municipal bond markets have generally gotten too bad a rap after a decade-long deleveraging.

Finally, while our focus is on public debt concerns, we also touch on a key private sector debt worry right now: a potential wave of corporate bankruptcies that could cause more lasting "scarring" to the economy. We speak with David Skeel, Professor at the University of Pennsylvania Carey Law School. He expects a bigger wave of corporate bankruptcies than we saw after the Global Financial Crisis (GFC), and is concerned that bankruptcy court congestion could lead to more small business liquidations and longer and costlier bankruptcies for large firms than normal. GS US economists David Mericle and Ronnie Walker confirm a moderate increase in US bankruptcy indicators so far, and see signals of more bankruptcies ahead. And Lotfi Karoui, GS Chief Credit Strategist, sees US high yield corporate default rates rising to 13% by year end—on par with post-GFC levels—with risks of a longer and more damaging default cycle that may see more liquidations, even among large firms, than in the past.

We wish everyone good health during this difficult time. P.S. Don't forget to 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 Kenneth Rogoff

Kenneth Rogoff is Thomas D. Cabot Professor of Public Policy and Professor of Economics at Harvard University. Previously, he served as Chief Economist at the International Monetary Fund. Below, he argues that large increases in government debt are entirely appropriate now—though are not a free lunch—and that the Euro Area and EMs face a challenging road ahead.

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



**Allison Nathan: Has the large increase in government deficits and debt during the coronacrisis been appropriate?**

**Kenneth Rogoff:** Absolutely. We're looking at the worst natural disaster in generations, probably since the Spanish flu. The whole point of having a strong balance sheet is to be able to

use debt aggressively when you are faced with a full-on crisis. I would have no problem with policymakers taking the same actions twice over if it means we get out of this in one piece.

**Allison Nathan: But your work has shown that in advanced economies higher debt levels—above 90% of GDP—are associated with lower growth rates. So with many countries now set to far exceed that threshold, how concerned should we be that supporting growth now will come at the expense of growth later?**

**Kenneth Rogoff:** To start, my views here have often been misstated by polemicists. In our [2010 proceedings note](#) and [2012 journal paper](#) on this topic, Carmen Reinhart and I observed that historically, averaging across *all* advanced economies, for countries with debt-to-GDP ratios above 90%, there is an association between growth and debt, with growth about a percent lower than the average of countries with lower debt-to-GDP ratios. Importantly, we clarify that debt rising from 89% to 90% no more means a big change in this context than does a rise in cholesterol levels from 199 to 200. We are also very careful about attributing causation, as well as noting that different countries have different features that make their growth more or less vulnerable to high debt levels—the US is in an entirely different position than is Italy, for example.

That said, substantial academic literature published over the last 10 years thoroughly supports our conjecture that higher debt and lower growth are correlated. The causation remains debated, but the research literature definitely underscores that countries with very high debt levels are sometimes more reluctant and less able to vigorously support their economies in a crisis, which in turn impacts longer-term growth.

But putting all of that aside, the key point today is that given the magnitude of the challenges we're facing, the gains to borrowing are tremendous, and the growth implications of not borrowing would be a lot greater than any growth implications of borrowing. While a lot depends on how the pandemic unfolds, right now output is probably down at least 25%, and I don't see the US and global economy returning to 2019 levels for perhaps five years. So losing some growth over the longer term because of high debt is nowhere near the main worry. You should use debt when there's a big payoff, and it's hard to imagine a moment with a bigger payoff than today.

**Allison Nathan: Do you agree with Olivier Blanchard and others that very low interest rates are a reason to be less concerned about the longer-term costs of debt?**

**Kenneth Rogoff:** Not necessarily. Blanchard's point seems to be that when the interest rate is below the nominal growth rate, even a big bulge in borrowing isn't that worrisome because the debt-to-GDP ratio will, by definition, fall over time. Historically, however, it's actually common for the interest rate to be less than the nominal growth rate. Paolo Mauro and Jing Zhou at the IMF [find](#) that this has been the case more than half the time in advanced economies over the past 200 years, and that the interest-growth differential is not helpful in predicting whether or not a country experiences a debt crisis.

The other important point is that headline market debt represents just a sliver of the obligations of the modern welfare state. For example, as high as Italy's debt is—on the order of 135% of GDP—Italy pays out 16% of GDP in publicly provided pensions, which swamps its debt position. Similarly, in the US, social security alone certainly dwarfs headline government debt. In my view, the headline market debt should be looked at as senior debt, and social security spending should be looked at as junior debt. With that perspective, when headline market-based debt goes up, it isn't necessarily a free lunch, you're just not seeing the risks being passed on to other types of debt in the government's portfolio because social security debt is not traded in financial markets. So of course rising debt is not desirable and is not a free lunch, even with very low interest rates; that view is just wrong. There are longer-term costs that we should try to mitigate by, for example, issuing much longer-term Treasury debt, which would reduce the risk profile of the borrowing. But that doesn't mean we shouldn't be buying lunch for everyone right now. We should be doing so.

**Allison Nathan: It's often argued that the US is generally less vulnerable to debt-related issues due to the dominant role of the Dollar in the global economy. Do you agree?**

**Kenneth Rogoff:** It is certainly true that there's a huge advantage to being the hegemon; with the Dollar [at the center](#) of the global financial system, the US can borrow more and at a lower interest rate. But, as Emmanuel Farhi and Matteo Maggiori have [emphasized](#), as borrowing rises, the equilibrium becomes more fragile and the Dollar's vulnerability increases. De-globalization will only reinforce this fragility. That said, I don't see a high likelihood of a big change anytime soon. The Dollar's position is very solid; nobody is coming in to compete. But over the next 10 to 20 years, the Dollar could be challenged, and the coronacrisis may have brought forward when that might happen, even if it is still a long way off.

**Allison Nathan: How concerned are you that rising deficits and debt levels in the Euro area, and in Italy in particular, will threaten the stability of the common bloc?**

**Kenneth Rogoff:** The Euro cannot easily withstand these two and three standard deviation shocks. There's huge anger in Italy, as well as in Germany. This is a bad moment for the Euro, and it will end in one of two ways. One way is greater integration through some form of debt mutualization beyond the ECB, such as the issuance of a Coronabond or a Eurobond for the common bloc, which would help stabilize the situation. And the other way is an unravelling. It's hard to know which one will prevail. The Europeans have risen to the occasion in the past, and progress on the Recovery Fund is a positive step, but we're at the early stages of this, and if it lasts for another couple of years, who knows how things will go.

Italy, for its part, is in dire straits. It needs to borrow a lot of money, and is not allowed to do so within the Euro framework. It has been given some reprieve, but with Italian debt already downgraded to just above junk status, it's not clear how far the markets will let this go. So it's a fragile situation that depends as much on how the politics play out as on economic and market dynamics. The impact of this situation on politics will certainly be bigger and more unpredictable than even the 2008 crisis. And how the Euro fares will be a key feature of that.

**Allison Nathan: Emerging Markets (EMs) have historically been at the epicenter of most debt crises. How vulnerable are EM economies to such crises today?**

**Kenneth Rogoff:** EMs are in the most troubling situation since the 1930s. Just consider what they are facing: a collapse in commodity prices, plummeting global trade, much slower growth in China—perhaps as low as 3% over the next decade—and all amid an ongoing shift towards de-globalization. That's before we even consider the direct risk of COVID-19, which initially seemed relatively mild in EMs—maybe due to their younger populations or the weather, but perhaps it's just a matter of time. The Spanish flu took a couple of years to fully unfold, and the virus spread in EMs appears to be worsening. Given these conditions, I expect a number of EMs to default. Argentina has already done so, but many energy exporters in particular will be challenged to meet their debt obligations.

**Allison Nathan: But does the fact that EM countries have been borrowing more in local currency reduce their vulnerability to crises at all?**

**Kenneth Rogoff:** EMs are in stronger positions today, but, in my view, that's not because of the currency of denomination, but because of the court of jurisdiction; local currency debt is adjudicated in home country courts. Greece was able to brutally treat its creditors in the Greek debt adjudicated in Greek courts, whereas the debt adjudicated in London courts got paid in full. For this reason, I've argued for 30 years that EMs should only be able to borrow in their own jurisdictions. But, as positive as this shift towards home jurisdictions is, a substantial amount of corporate debt in EMs is not in local currency, and most EMs are not that diversified and therefore not in a position to just allow their corporations to melt down. And if COVID-19 hits in a bigger way, these economies will need to borrow more. Again, we are not looking at the 1980s, 1990s, or 2000s; we're looking at the 1930s, and it's just hard to know what lies ahead.

**Allison Nathan: You've advocated for a debt moratorium for troubled countries to help address these stresses, but how likely is that in reality?**

**Kenneth Rogoff:** A debt moratorium is really only possible if the G20—including China, which is a huge creditor—declares it to be in the global interest. So the fact that Reinhart and I [said](#) it was a good idea doesn't mean that it's going to happen, and it's not around the corner. But if the global economy goes from bad to worse, then a lot of things which don't seem possible now might become possible.

**Allison Nathan: Should we be concerned that the rise in debt levels will lead to too much inflation down the road?**

**Kenneth Rogoff:** A number of market commentators seem to say that high debt has to end in high inflation. But as long as interest rates stay very low, that isn't necessarily the case—something has to happen that creates pressure, and the reality is that we will probably see deflation for a prolonged period.

That said, history tells us that shocks do happen. The issue today is that the market seems to think that any shock will only further drive down global real rates and that there is zero chance of ever having inflation again. I think that's wrong; some shocks could very well push real rates higher, which would create a lot of pressure. Even a modest rise in real rates over a two or three-year period would generate substantial pressure that would put inflation back on the table.

**Allison Nathan: US markets have very recently begun to price in a higher probability of a negative fed funds rate. If central banks embrace deeply negative interest rates, how would that help with debt dynamics, and/or more broadly?**

**Kenneth Rogoff:** Of course, negative rates would help with debt dynamics, but their benefit extends far beyond that. I've argued for a decade that in this world of very low neutral real rates and inflation, the current central bank toolkit is too limited to deal with massive shocks like what we're now experiencing. Deeply negative rates are the bazooka—the “whatever it takes” instrument—that central banks need today.

In my view, the extension of standard monetary policy in this way would have a powerful influence on behavior, ultimately resulting in higher long-term interest rates, inflation, housing prices, and equity prices. So I don't think concerns about harmful effects on the financial industry and wealth holders are warranted. And such a policy would provide a market-oriented mechanism for the private sector to pick winners and losers rather than the central bank itself directing credit through municipal and corporate bond purchases, which is an effective strategy but raises questions about how far we want to go towards central bank socialism.

That said, for deeply negative rates to work, you have to deal with the cash hoarding problem—not by ordinary savers that will barely register—but by big financial firms that would need to be prevented from hoarding billions of dollars. But this is surmountable with appropriate central bank preparation. So far, the Fed has not shown interest in negative rates because of the view that if it isn't broke, don't fix it. But it is broke now, and my guess is they'll be thinking about this. Such a policy isn't going to happen soon because it's just too big of a step. But if I'm correct that the road to recovery is going to be long and painful, negative interest rates would be a piece of dealing with what lies ahead.

# Interview with Jan Hatzius

Jan Hatzius is Head of Global Investment Research and Chief Economist at Goldman Sachs. Below, he discusses the impact of debt dynamics on the economic recovery as well as the prospect of a negative fed funds rate.



**Allison Nathan: You generally have not been that worried about increased government deficits and debt leading to too much inflation, drags on growth, or debt crises. But given the tremendous rise in deficits and debt in response to the coronacrisis, are you at all concerned at this point?**

**Jan Hatzius:** No. As the private sector pulls back amid the crisis, governments are right to step in and bridge the gap through large increases in spending. In the current environment of exceptionally weak demand and economic activity, running large government deficits won't be inflationary, and is not a reason to worry about a debt crisis, at least in countries like the US, UK, Japan or other advanced economies that have a floating exchange rate and their own central bank. And it's definitely not a reason to worry about a growth drag. I can see why debt levels and growth might be correlated, and why very high debt levels might leave a country less well-positioned to invest in areas like infrastructure that promote growth over the longer term. But the causation probably mostly goes the other way, from weak growth to high debt levels. Certainly in the short term, it's hard for me to see how larger deficits would lead to weaker growth; all else equal, a bigger deficit delivers more stimulus to the economy. And we absolutely need substantial stimulus right now as the crisis continues to unfold.

**Allison Nathan: At what point would you become more concerned about the deficit/debt levels?**

**Jan Hatzius:** I would become more concerned if we got to the other side of the crisis and of the pullback in the private sector—the timing of which will depend on the trajectory of the virus, government restrictions to contain it, and the availability of effective treatments and vaccines—and we still have deficits close to current levels and no plan for normalizing them over time. But that still seems like a long way away. We first have to get through the current crisis and, in the US at least, see unemployment start to normalize back to the single-digit range, which we don't expect until sometime in 2021 at this point. So there's time to plan for the eventual necessary shift towards fiscal consolidation.

**Allison Nathan: But would the US be in a stronger position if it hadn't entered this crisis on the heels of counter-cyclical fiscal stimulus that had already raised debt levels?**

**Jan Hatzius:** The political appetite for increasing the deficit further when you're already at a higher debt level might be a bit more constrained than it otherwise would be. But relative to the scale of the current challenges whether the starting point is 75% debt-to-GDP or 80% is not significant.

**Allison Nathan: All that said, US state and municipal indebtedness was already a problem in some places before**

**the coronacrisis and has worsened sharply in its aftermath. How much could this issue weigh on US growth?**

**Jan Hatzius:** State and local government spending will likely be a drag on the recovery for the next several years, at least. And that's probably the best-case scenario. The worst-case scenario is one in which a number of state and local governments default, leading to upheaval in the municipal bond market. That scenario still seems less likely to me, partly because we expect Congress to pass a "Phase Four" fiscal package in late June that includes substantial help for state and local governments. The state and local support won't be anywhere near as large as the \$1 trillion included in the recently passed House package, but we expect at least a couple of hundred billion dollars of aid. Of course, the approaching election could jeopardize such an agreement, but congressional Democrats are strongly in favor of additional help, and it's also in President Trump's interest to avert any type of crisis. So we believe the probability of an agreement is relatively high. But even with that, state and local governments will likely have to impose more austerity. They don't have the same ability to run deficits as the federal government, and that will undoubtedly weigh on the recovery.

**Allison Nathan: Are you concerned that the worrisome debt dynamics in parts of the Euro area could result in a crisis, especially given ECB constraints?**

**Jan Hatzius:** I am concerned that we could at least see enough worry about a potential crisis to lead to a sizable widening in peripheral spreads at some point. Southern countries in the Euro area are experiencing a very deep recession, and must run extremely large deficits. But how far the ECB, or Europe more broadly, will go in helping them manage the current stresses remains uncertain. Economically, the central bank has no real limit in terms of its ability to finance large government deficits. But political constraints continue to loom given Germany and other countries' historical concern that financing large deficits in the periphery, and in Italy in particular, will encourage irresponsible fiscal policy, ultimately leaving them to foot the bill. I don't agree with that view, especially in a crisis like this one, but it clearly exists.

I do think the onslaught of COVID-19 has engendered a greater sense of European solidarity than has been the case in several years, and the recent Franco-German Recovery Fund proposal, which the European Commission's proposal expands upon, is an encouraging development. But substantial uncertainty remains. And the recent German Federal Constitutional Court ruling threatens to constrain the ECB's flexibility in implementing asset purchases that may be required to ensure stability. This makes our expectation that the current Pandemic Emergency Purchase Programme (PEPP) will be expanded at the June ECB meeting a closer call.

**Allison Nathan: How likely is an emerging market (EM) debt crisis, and could one derail the global recovery?**

**Jan Hatzius:** EM economies are clearly under a lot of pressure, the extent of which will ultimately depend on how hard they are hit by the virus and the global economic slowdown. In terms of the virus, there's substantial uncertainty about its trajectory in developed economies, and even more so in emerging economies. So far, reported infections and fatalities have been higher in DM than in EM, but the EM numbers are worsening, and we may find that they have just been understating the problem all along, or that the virus hit to EMs is just happening later. So that's a risk.

The other issue is that many emerging economies are highly vulnerable to the global economic cycle, either because they are very natural resource dependent or very manufacturing dependent. So, while there is much greater variation across the emerging world than the advanced world, emerging economies are generally challenged, which raises concerns about resulting financial market stresses. Capital outflows from emerging economies were substantial in February and March; they have stabilized more recently, but the pressure definitely still exists and could certainly worsen again if the news flow and general market sentiment deteriorate.

All that said, I don't see emerging market stresses derailing the global economic recovery because most emerging economies are just not systemically important enough to generate a global crisis. China is probably the one real exception to that, but it has so far recovered remarkably quickly and appears to have the virus under control. So, the situation is concerning for many EMs, but I don't think EMs present a major downside risk for the advanced economies or for the world economy as a whole.

**Allison Nathan: How concerned are you that the build-up in private sector debt will slow or derail the recovery?**

**Jan Hatzius:** Private sector deficits are often more dangerous than public sector deficits because it's much less likely that governments run out of the ability to borrow in a crisis than companies. And if credit markets shut down during a downturn, then a large retrenchment in private sector spending must occur—especially if the starting point is a substantial private sector deficit—which then forces demand in the real economy sharply lower, exacerbating the downturn and potentially triggering a financial crisis.

Of course, heading into this crisis, the private sector was running a sizable surplus. But some pockets of private sector debt—such as leveraged loans—were arguably overheated, corporate debt growth more broadly was pretty high, and credit quality in some sectors, like retail, was already quite weak. And the crisis has undoubtedly hit certain sectors, like airlines and entertainment, exceptionally hard. The Fed has gone further than ever before to support corporates under these difficult conditions, but the high yield debt market is mostly outside this umbrella. So we will almost certainly see a substantial number of corporate defaults. Our credit strategists expect a 13% high yield default rate later this year on a 12-month trailing basis, similar to post-2008 levels. And a slower-than-expected economic recovery would likely increase this number and create credit problems in other markets. So, there are a lot of strains. None of them are driven by the private sector deficits associated with the last couple of recessions, but that doesn't make them any less serious.

**Allison Nathan: Markets have very recently begun to price in a higher probability of a negative fed funds rate, which would clearly help with debt sustainability globally. How likely is the Fed to move into negative rate territory?**

**Jan Hatzius:** The Fed is very unlikely to move to negative rates anytime soon. At the October 2019 FOMC meeting, every single one of the participants said that should further economic deterioration warrant more action, other unconventional tools such as QE and forward guidance were preferable to negative rates. And Chair Powell recently reiterated that the committee's views on this haven't changed.

Now, you can't completely rule out the possibility that they change their mind if enough time passes and the economy remains weak. The bond market is currently pricing in a very slight move into negative territory in 2021, which doesn't seem like a crazy place to be if you assume that rate hikes are off the table for the foreseeable future and that if the Fed decided to shift rates negative, they probably wouldn't do so by just 10 basis points. But I think there's a real limit to that because, as I said, such a shift is unlikely anytime soon.

**Allison Nathan: Would adopting negative rates help the economic recovery?**

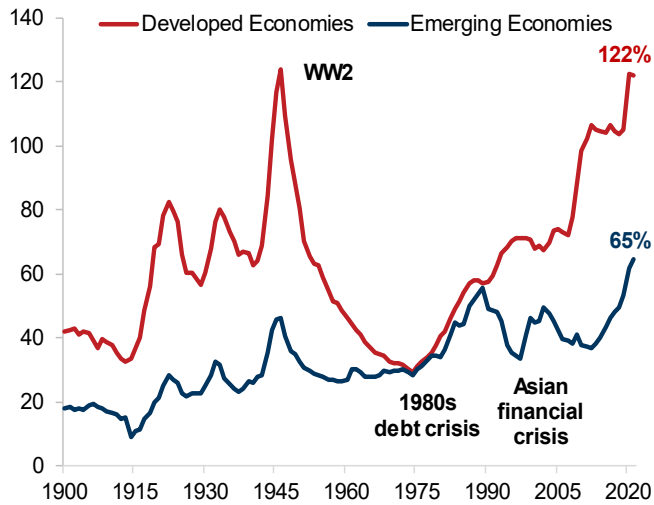
**Jan Hatzius:** The main argument in favor of negative rates is that they are the most natural continuation of conventional monetary policy, which we know has a significant effect on the economy. And in some places like the Euro area, where QE is more controversial politically, negative rates are generally the most attractive game in town. One of the arguments against negative rates used to be that money market funds wouldn't be able to fund themselves, which could be quite disruptive. But you don't hear that argument quite as much anymore, partly because some money market funds have adopted changes that could reduce disruption. The primary argument today against negative rates is that they could exert a drag on the banking system if banks can't or won't make deposit rates negative for various reasons. And weakening the banking system at a time when policy makers are relying on banks to extend credit and see the real economy through the slump is a major worry. Negative rates are also generally unpopular given potential negative impacts on savers.

With these pros and cons in mind, while I am not convinced that shifting US rates into negative territory would harm the economy, I also don't think it would be particularly helpful for this recovery for the main reason that the shift would have to proceed very slowly since it's never been done before; very few, if any, policymakers would be comfortable moving to deeply negative rates quickly given uncertainty about potential unintended consequences, and I would definitely advise against such moves. So I see much bigger upside right now to pursuing QE—a well-worn policy at this point—more aggressively if need be than embarking on negative rates. And I would view any near-term shift towards negative rates in the US more as an investment in our ability to fight the next downturn rather than the current one; dipping our toe into negative rates could perhaps set us up for a more impactful use of them the next time around.

# Debt download: a historic surge

## Debt levels are set to surge around the world...

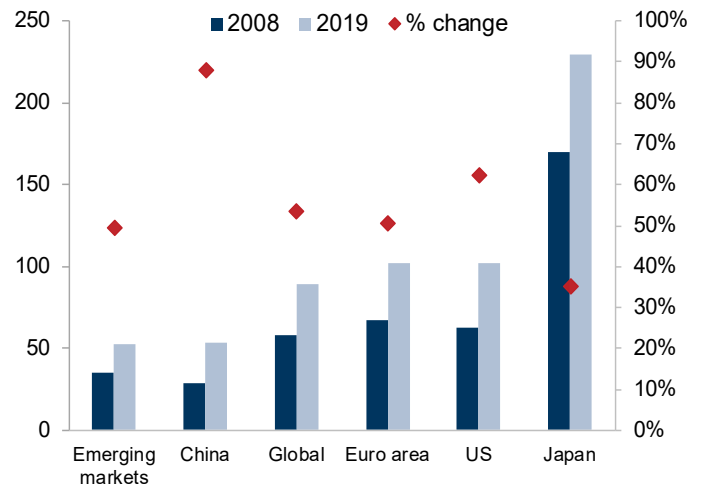
Median debt-to-GDP ratio in country grouping, % of GDP



Note: Based on G20-Advanced and G20-Emerging country groupings.  
Source: IMF, Goldman Sachs Global Investment Research.

## ...and had already risen since the Global Financial Crisis

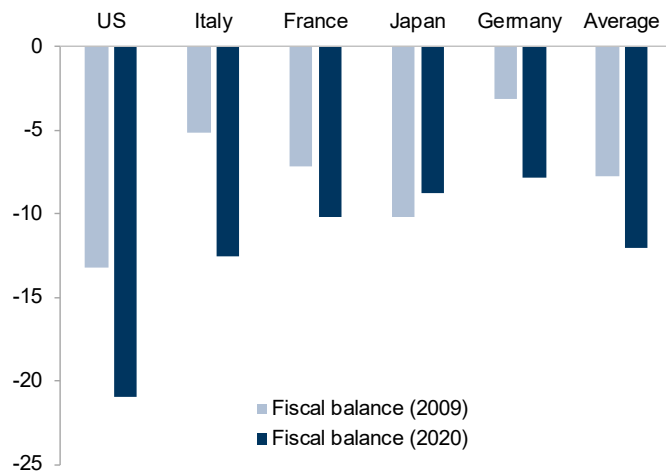
Gross debt as % of GDP (lhs); % change from 2008-19 (rhs)



Source: IMF, Goldman Sachs Global Investment Research.

## Most DM deficits will exceed GFC peaks...

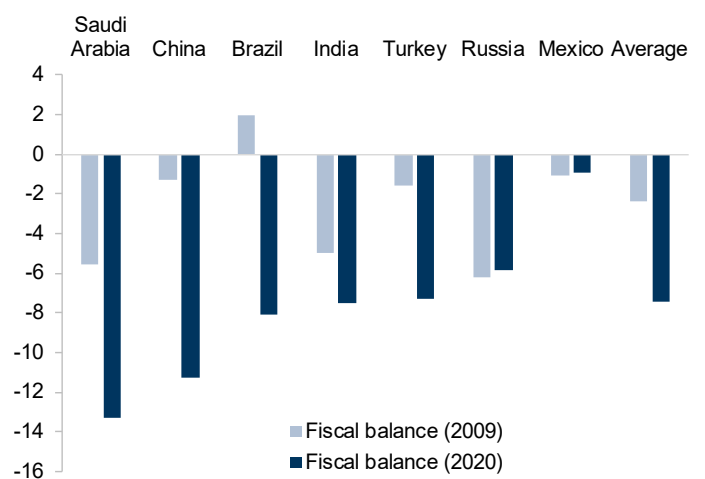
General government balance as % of GDP



Note: 2020 figures represent GS forecasts.  
Source: IMF, Goldman Sachs Global Investment Research.

## ...and fiscal easing in EM will be more than 3x larger

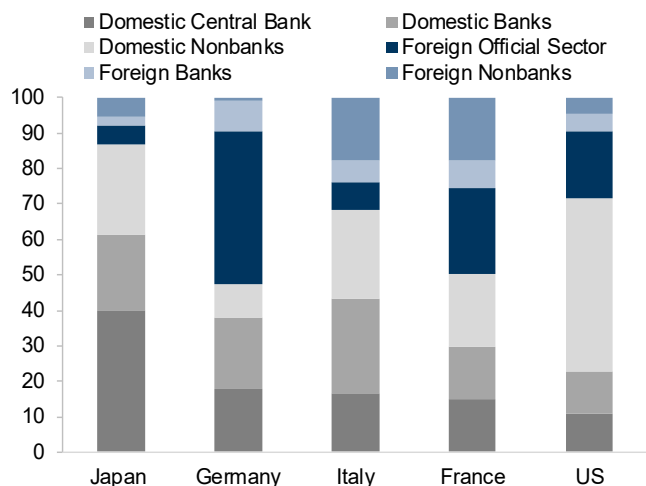
Primary government balance as % of GDP



Note: 2020 figures represent GS forecasts.  
Source: IMF, Goldman Sachs Global Investment Research.

## Owners of DM debt varied across countries pre-crisis...

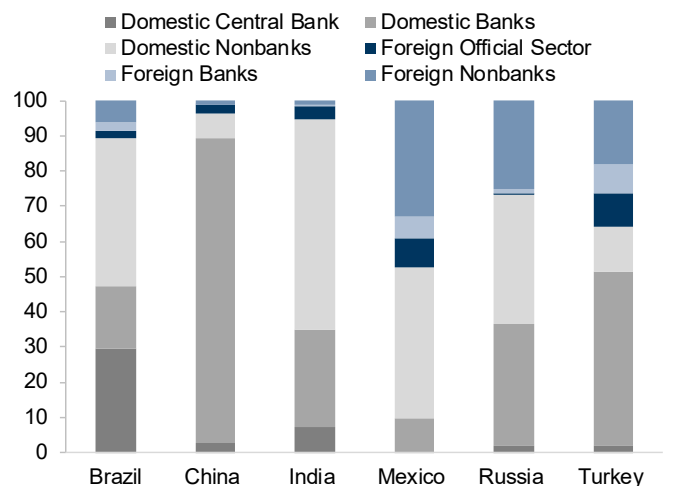
Ownership of government debt as of end-2019, % total



Source: IMF, Goldman Sachs Global Investment Research.

## ...and even more so across EM

Ownership of government debt as of end-2019, % total



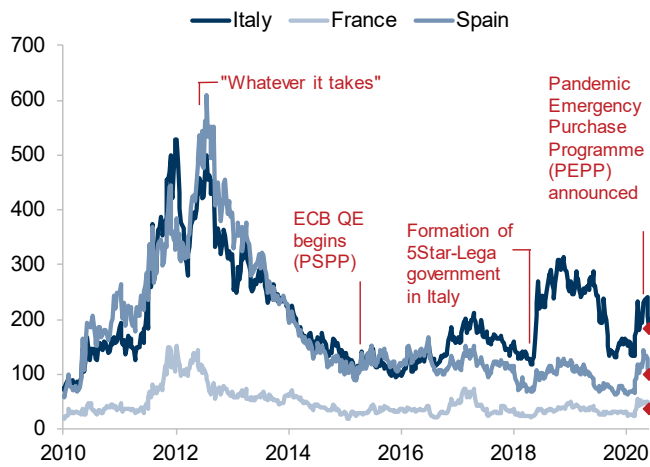
Source: IMF, Goldman Sachs Global Investment Research.



# Debt market risks in 2 hotspots: EA & EM

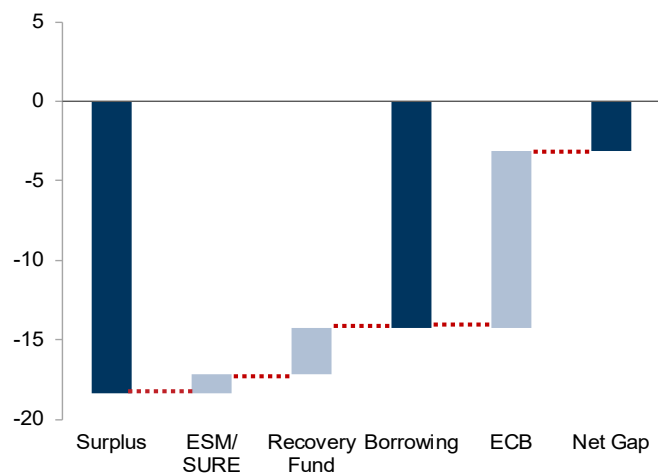
## EURO AREA

**Euro area sovereign spreads still below historic highs**  
10-yr government bond spread to 10-yr German bund, ppt



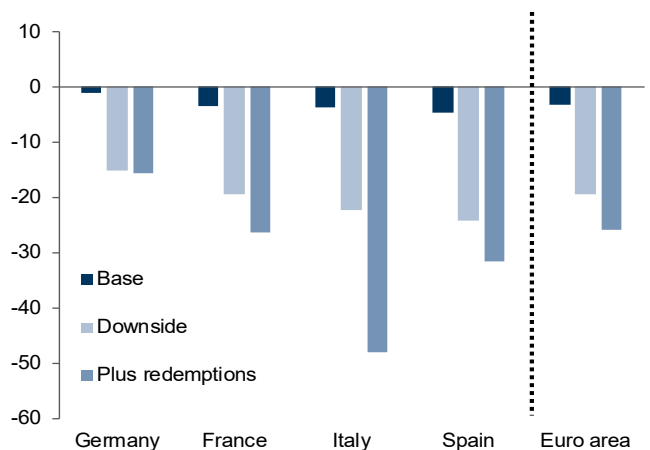
Source: Bloomberg, Goldman Sachs Global Investment Research.

**ECB purchases have helped to plug sizable funding gap**  
Two-year Euro area funding gap (2020-21), percent of GDP



Source: Goldman Sachs Global Investment Research.

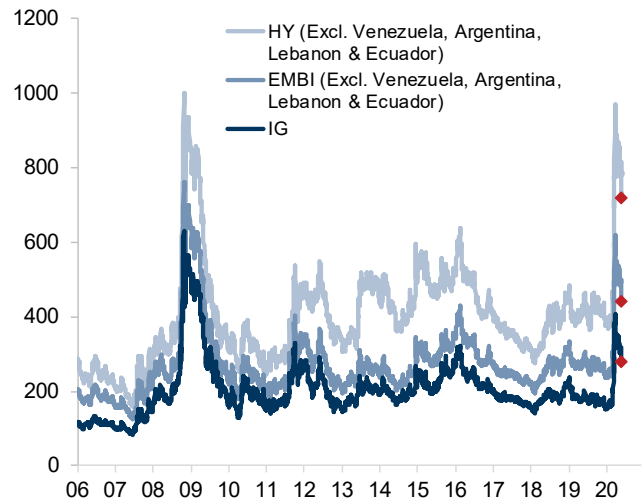
**But fiscal sustainability concerns could spark more volatility**  
Net financing gap 2020-22, % of GDP



Source: Goldman Sachs Global Investment Research.

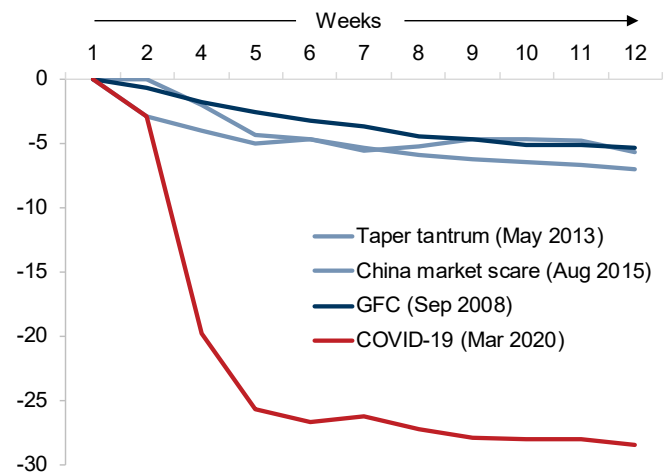
## EMERGING MARKETS

**High yield EM credit spreads remain elevated**  
Index spread vs US Treasuries, basis points



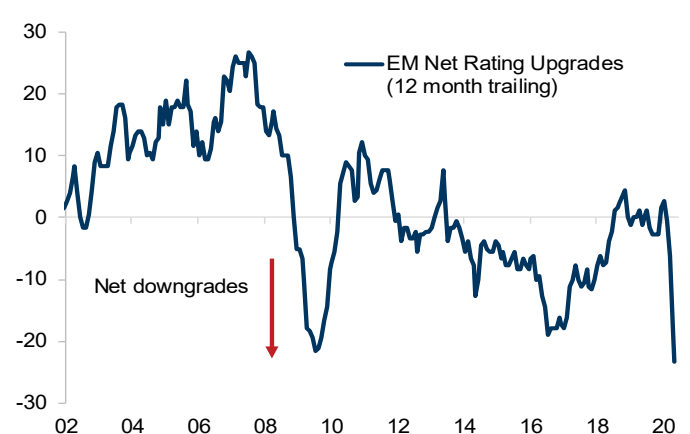
Source: Datastream, Goldman Sachs Global Investment Research.

**Outflows from EM bond funds outstrip past crises**  
Cumulative weekly EM bond outflows by event, \$ billion



Source: BIS, IMF, IIF, EPFR, Goldman Sachs Global Investment Research.

**The EM downgrade cycle has also been much faster**  
12-month cumulative rating change of EM sovereigns, notches



Note: Based on modal rating of Fitch, S&P and Moody's across ~80 EM sovereigns. Source: Bloomberg, Goldman Sachs Global Investment Research.

# Interview with Praveen Korapaty

Praveen Korapaty is Chief Interest Rates Strategist at Goldman Sachs. Below, he discusses the outlook for Developed Market (DM) rates amid the surge in issuance from the coronacrisis.



**Allison Nathan: Economies around the world will need to substantially increase debt issuance to fund COVID-19-related spending. How unusual is it for countries to ramp up issuance simultaneously, and how should we think about the magnitude required?**

**Praveen Korapaty:** It's not as unusual as you might think. Deficits are typically cyclical and surge during recessions. So, during a global recession, when all major economies are experiencing a contraction, it isn't surprising to see increased issuance in all regions. At the same time, recessions tend to increase demand for safe assets, such as Developed Market (DM) sovereign debt. So the global surge in supply is somewhat offset by a global surge in demand. But this time around, the issuance will need to be exceptionally large. This is especially the case in the US, where we expect the deficit to climb to around 20% of GDP, which we haven't seen since WWII. Other countries, including in the Euro area and Japan, are running deficits closer to 10% of GDP, which is closer in magnitude to what we have seen at various points within the last few decades, but is still high relative to history.

**Allison Nathan: How much of this issuance can and will be absorbed by central banks, and how much do you think will need to be absorbed by other market participants?**

**Praveen Korapaty:** Central banks across the globe have clearly stepped up their purchases of domestic issuance, and, in theory, there's no limit to how much they can buy. But that's not true for all central banks. For example, the operating assumption for the ECB is that it will be constrained to buying no more than 50% of debt outstanding. For perspective, right now it owns about 42% of German debt outstanding. This compares to the Bank of Japan currently owning about 50% of JGBs outstanding, the Fed owning about 22% of US Treasuries outstanding and the Bank of England owning just under 20% of Gilts outstanding. So the US and UK, in particular, still have substantial room to increase purchases from here.

That said, of the \$4tn in US issuance that we expect in the current fiscal year, we estimate that the Fed will end up buying about \$2.5tn, which would leave \$1.5tn to be absorbed by market participants. The biggest buyers of this issuance will likely be money market funds, given that the surge in issuance globally has been concentrated in short-end bills, which pairs well with recent strong inflows into government money market funds on increased risk aversion. Other market participants will absorb the remainder of the issuance, including the foreign official sector, levered investors that are willing to invest at these low yields simply because they can finance at even lower yields, and banks and other institutions that have to hold sovereign debt for regulatory reasons.

**Allison Nathan: Will yields have to move higher to see this issuance absorbed?**

**Praveen Korapaty:** We think some modest repricing—on the order of 10-20bps—will likely be required despite these apparent sources of demand. That's especially because longer-term yields are closer to the effective lower bound today than in past recessions, which suggests that the supply-related impact on yields could be greater than in past cycles.

**Allison Nathan: So where does that leave your US yield outlook, and the balance of risk around this view?**

**Praveen Korapaty:** We expect 10-year Treasuries to end this year at 75bps and 2021 at 135bps, which assumes a sharp sequential recovery in economic activity in the US and globally during 2H20. We think risks to these forecasts are skewed to the upside given the speed of the Fed's response and both the speed and magnitude of the fiscal policy response in the US, which has far exceeded our expectations. That said, given the still large uncertainty about the trajectory of the virus, we don't expect to see this upside immediately, and therefore believe yields will remain largely range-bound in the near term.

**Allison Nathan: Will differing debt trajectories across regions impact relative yield spreads?**

**Praveen Korapaty:** To some extent. For example, even with Germany running a deficit of 10% of GDP, we don't expect the same amount of pressure on German yields as on yields in the US or the UK, where spending has been bigger and more proactive. So we see US and UK yields moving higher relative to German yields. Of course, if the US and UK were to pursue a negative interest rate policy, the relative yield spreads could evolve differently.

**Allison Nathan: Is the market assigning too high a probability to negative rates in the US given the Fed's pushback, and where is that pushback coming from?**

**Praveen Korapaty:** The market was recently assigning greater than even odds of a negative fed funds rate before the end of this year, which we thought was too high. But market expectations moderated as Fed speakers pushed back against a negative rates policy, and are now pricing in slightly negative rates only later in 2021. While the Fed has expressed its reservations, it hasn't completely shut the door on negative rates, so current pricing doesn't seem unreasonable.

In terms of Fed pushback, when this option was explored in the aftermath of the Global Financial Crisis (GFC), a key worry was that negative rates would cause a run on money market funds because these funds guarantee a constant net asset value (NAV) of one, which wouldn't be sustainable with negative rates since that would imply a loss of principal. Today, many funds are variable NAV instead of constant NAV, so some people believe this concern has been averted. But government-only funds are still constant NAV, and so the risk remains.

People also point to a functional money market industry in Europe in a negative rates environment as a reason to be less concerned. But the European money market industry is much smaller than the Dollar money market industry, which is over

\$4tn today, and the centrality of Dollar money markets to global finance cannot be understated. So the Fed probably continues to view risks around money market funds as not worth taking. The other issue is that it would be difficult to cut too deep into negative rate territory without a politically palatable way of penalizing cash, which people would otherwise turn to. And the thought process may be that if you can't cut deep due to this political constraint, why bother to do it all?

**Allison Nathan: If the Fed did embrace negative rates, what's the likelihood that we'd see a wave of Treasury selling that could ultimately push rates higher?**

**Praveen Korapaty:** I'm not sure yields would rise, but the desirability of holding Treasuries would certainly decline, particularly for cash investors that don't finance their positions. Investors that finance their positions don't care as much about negative rates as long as they are able to finance their position at an even more negative rate. But cash buyers would be guaranteeing a loss in principal, so there would certainly be a loss in demand from those investors. For example, right after the ECB went to negative rates, fixed income portfolio flows shifted out of Europe and into the US.

**Allison Nathan: To what extent will the issuance impact the shape of the yield curve?**

**Praveen Korapaty:** The supply picture should steepen the yield curve, especially because the risks to owning duration today are asymmetric. In the US, yields can rally only so much this close to the effective lower bound, but there is no theoretical limit to how much they can sell off if the economic recovery is faster or stronger than expected. So investors must be compensated more for taking duration risk at these low yield levels. The fact that Treasury has added more duration than markets were expecting reinforces this steepening.

Other factors beyond supply will also likely affect curve shape, but in the same direction. These include future Fed policy that may entail forward guidance as well as some form of yield curve control if need be, both of which would likely further pin down front-end yields out to 3 or 5 years. And the improvement in the underlying economy that we expect will show up primarily in longer-term yields, which, in itself, will likely lend a steepening bias to the yield curve. That said, the Treasury curve has already steepened over the past month, so we may be in for a period of consolidation in the near term, but I think the curve can steepen considerably more over a 6- or 9-month period. In core Europe, this steepening pressure is likely to be less pronounced given the constraints policy makers are working under.

**Allison Nathan: Euro area peripheral spreads have been a source of concern given worrisome debt dynamics and ECB constraints. Does anything look mispriced in the Euro area at this point?**

**Praveen Korapaty:** Not really. Although one could reasonably argue from a pure economic perspective that the challenges facing the Euro area today pose as big a threat as those during the Euro crisis, so far the ECB and national governments have done enough to keep spreads relatively contained. And it's hard to argue that this won't persist for the time being as

governments continue to work toward a more sustainable resolution of this threat. Indeed, the recent progress on the Recovery Fund is an encouraging step in this regard. But the reality remains that the ECB's current strategy won't be sufficient to crowd in private buyers. We estimate that the ECB is currently buying roughly the same amount as the projected deficits for many European countries, but we think that many of these deficits could actually be much larger, which could require the ECB to upsize its current purchases. For this reason, we expect the ECB to increase its Pandemic Emergency Purchase Programme (PEPP) at the June meeting, but it's a close call.

**Allison Nathan: If the ECB disappoints, how might the market react?**

**Praveen Korapaty:** Spreads are already tight versus fundamentals, so an ECB disappointment next week could see spreads drift wider again, but probably not to pre-PEPP wides. A more sizable repricing would likely require a sequence of disappointments both from the ECB and the fiscal authorities as they continue to consider packages to shore up the weakest economies. The markets would need to lose confidence in policymakers' willingness to provide, even begrudgingly, a backstop to the market to prevent the unravelling of the Euro. The recent agreement on the Recovery Fund, however, moves modestly in the other, more positive, direction.

**Allison Nathan: More broadly, are there any other risks you're watching that could lead to a sizable repricing of DM sovereign bonds?**

**Praveen Korapaty:** In the near term, outside of the unique challenges of the Euro area, any material repricing will likely be driven by the trajectory of the virus and its implications for the economic recovery. Over the longer term, I'm watching the implicit fiscal-monetary policy coordination during this crisis. Indeed, given the massive size of the issuance to fund deficits and liquidity constraints from other market participants, the Fed has been forced to buy a huge amount of assets—around \$350bn Treasuries a week at the peak of the market volatility, which is comparable to the total size of past programs enacted over much longer periods—in order to maintain orderly market functioning. And we expect sizable central bank purchases will have to continue in order to avoid future market stresses. Whether you want to call that fiscal-monetary coordination or not, the reality is that a large fraction of sovereign debt issuance will end up on central bank balance sheets to ensure normal market function. And this has evolved without the oversight superstructure that some people have called for to ensure fiscal discipline and avoid explicit monetary financing of fiscal deficits.

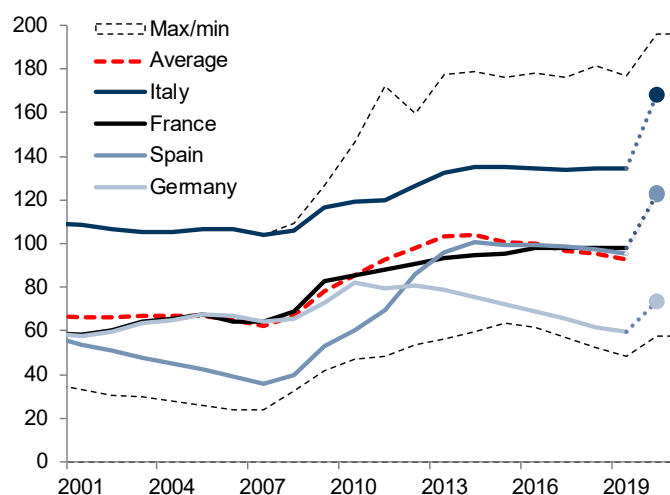
This is not problematic right now because the government is essentially replacing lost demand. But it could become an issue if it represents a paradigm shift toward deficit financing without any safeguards that continues well into a recovery. It's not clear at all that's where we're headed, but if this becomes a regular practice, it could ultimately have dramatic implications for inflation and yields over the longer term, including potentially reversing the 40-year bull market in bonds. So that is something to watch out for.

# Europe's risky sovereign debt

George Cole and Christian Schnittker argue that the path for European sovereign spreads depends on the transition from the politics of COVID-19 to the politics of debt sustainability

The COVID-19 shock is likely to cause significant deterioration in the fiscal health of European economies, particularly those in southern Europe. We forecast double-digit deficits in Italy and Spain in 2020, while debt-to-GDP ratios will likely rise by more than 20ppts in France and Spain, and by more than 30ppts in Italy—new highs for these major economies. And relative to Germany, debt ratio differentials will likely spike to record levels, exacerbating a widening trend that began in 2009.

**We expect debt-to-GDP differentials to reach record levels**  
GS debt-to-GDP forecasts for 2020, %



Note: Average includes DE, FR, IT, ES, NL, PT, AT, BE, FL, IE, GR, CY.  
Source: Haver Analytics, Goldman Sachs Global Investment Research.

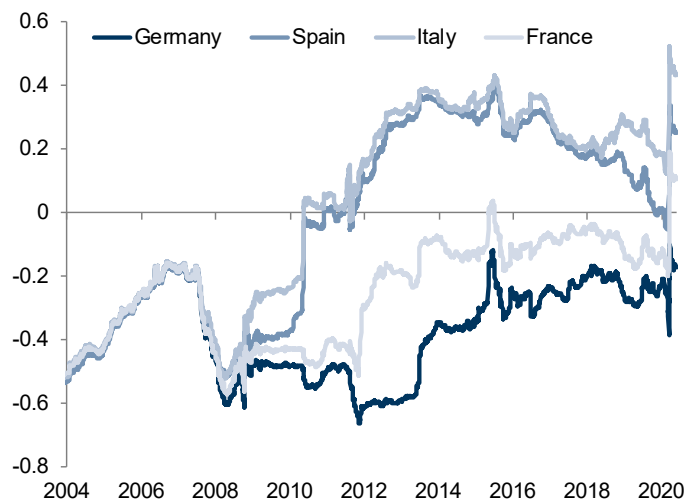
Of course, such deterioration in debt ratios is not unique to Europe—indeed, all major markets will see a substantial rise in deficits and debt. But fiscal deterioration matters more in three specific ways for the Euro area. First, the Euro area is not a unitary system in which fiscal and monetary coordination can occur without limit; the recent decision by the German Federal Constitutional Court (GFCC) was a reminder of these specific legal limitations. Second, while sovereign restructuring may theoretically be a possibility for other countries, it is a relevant risk in the Euro area. Third, differentiation between Euro area economies means that unique political dynamics are at play. Taken together, this means that public debt for most sovereigns in the Euro area is not risk-free, and unlike in other G10 economies where debt trades with a negative correlation to risk, some economies in Europe actually *lose* fiscal space through higher interest rates when the cyclical outlook deteriorates.

## European sovereign debt is not risk-free

When assessing how to translate Europe's fiscal risks into sovereign credit risk, it is important to understand that European sovereign debt is not like the local currency debt of other G10 economies. For one, national level fiscal authorities cannot rely on unconditional support from the supranational ECB, nor can currency weakness be relied on to assist with an inflationary adjustment. At the other extreme, European sovereign debt is not like hard currency debt, either, in that the ECB can and does create Euros to purchase European sovereign debt, maintaining lower rates than would otherwise prevail. This means that the market can generally assume that weak macro fundamentals, ECB support and the prospect of further area-wide fiscal integration will keep yields low. But, at the same time, the market understands that southern European debt is not risk-free as reflected, for example, in the positive correlation between stocks and BTPs/Bonos.

## The market knows southern European debt is not risk-free

Correlation coefficient between stocks and bond prices



Source: Goldman Sachs Global Investment Research.

## Is Europe's debt sustainable?

So just how risky is Europe in terms of its debt sustainability? Debt sustainability depends on four basic elements—the initial debt stock, the primary balance (a government's net borrowing excluding interest payments on its debt), the nominal interest rate and nominal growth. So, for example, a country with a relatively large debt stock that borrows at a higher interest rate will need to see stronger growth and a higher primary balance to stabilize its debt. In practice, these elements vary widely between Euro area countries. Italy typically runs relatively high primary surpluses, with little cyclical volatility; however, nominal growth is low and the debt stock is high. France, in contrast, typically benefits from low interest rates, although it has a stubbornly low primary balance and low nominal growth. And Spain generally experiences higher growth, and a high elasticity of the deficit to debt levels, but, when growth falls, fiscal variables deteriorate sharply.

Assessing<sup>1</sup> how these elements could evolve in the future suggests that debt ratios in the major European economies will most likely decline over the coming decade, with the sharpest declines occurring in Germany and Spain. And it's no surprise that Italy has the highest probability of ending up on an unsustainable debt path over the next decade—at 35%—compared with 16% for Spain, 10% for France and 2% for Germany. Assuming nominal growth of 1.7% and an effective interest rate of 2.5%, Italy would need to run a primary surplus of at least 1.3% to stabilize its debt-to-GDP level.

### An illustrative look at debt sustainability in Italy

Scenarios of primary balance needed to stabilize debt-to-GDP

Nominal growth (g)	Nominal interest rate (i)					
	0%	1%	2%	3%	4%	5%
-1%	1.7	3.4	5.1	6.8	8.5	10.2
0%	0	1.7	3.4	5	6.7	8.4
1%	-1.7	0	1.7	3.3	5	6.7
2%	-3.3	-1.6	0	1.6	3.3	4.9
3%	-4.9	-3.3	-1.6	0	1.6	3.3
4%	-6.5	-4.8	-3.2	-1.6	0	1.6

Note: Primary balance excludes interest payments.

Source: Goldman Sachs Global Investment Research.

### Two opposing risks

Given these probabilities, how much risk around debt sustainability should the market be pricing in today? On the one hand, the GFCC's recent decision to demand a higher standard of justification for ECB sovereign bond purchases refocused attention on the legal limits of ECB support of fiscally-distressed countries. The main consequence of the decision is to reiterate that the guarantor of debt sustainability in Europe will be either national level fiscal policies, or (quasi) permanent transfers through area-wide fiscal risk sharing. Indeed, the GFCC ruling presents a challenge to the prior belief that the ECB would always "do whatever it takes" to contain sovereign risks in Europe.

On the other hand, progress on the Recovery Fund—with the European Commission's recent proposal being considerably larger and comprised of more grants relative to indications given in April—has the potential to alter the market psychology on European sovereign debt. If northern European countries offer solidarity in the current crisis through more generous transfers to fund the recovery from the COVID-19 shock, it may induce political goodwill from the heavily-indebted southern European sovereigns to undertake fiscal reforms, which in turn could encourage further support through transfers.

### Only a political process can guarantee debt sustainability and tighter spreads

In weighing these political developments against the macro risks, we believe the level of sovereign peripheral spreads today—roughly halfway between pre-COVID levels and the widest point reached just before the announcement of the ECB's Pandemic Emergency Purchase Programme (PEPP)—is fair. In fact, our forecasts for growth, deficits, and debt levels suggest that spreads—if anything—are too narrow. And this remains true even if the PEPP is upsized as we expect. But the market path for spreads will ultimately be contingent on whether there will be a smooth transition from the politics of COVID-19 to the politics of debt sustainability in Europe. On this basis, we think that it is premature to call for a sustained return to pre-COVID tightness in spreads, although the Recovery Fund—as a step towards greater fiscal risk-sharing—should defer short-term concerns around debt sustainability in Europe and reduce near-term tail risks.

### Spreads are not wide relative to macro fundamentals

GDP-weighted 10y Euro area spreads to Germany, %; GS valuation



Source: Goldman Sachs Global Investment Research.

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<sup>1</sup> We model the evolution of the debt stock in major European economies using the historical behavior of growth, interest rates and the primary balance. Nominal growth and bond yields follow an autoregressive process in our model, while the government's primary balance depends on the debt-to-GDP ratio—typically rising when the debt ratio is high. We estimate this model for each of the EMU-4 economies with annual data dating back to 1995, and use the distribution of historical outcomes together with the model's estimated parameters to project the likely distribution of the model's variables from 2023 onwards, once the initial COVID shock has dissipated. Following the literature, we define the probability of debt sustainability in this model such that the debt-to-GDP ratio is on a non-explosive path: this definition varies by country depending on the country's interest rate, nominal growth, and the responsiveness of the fiscal balance to the debt-to-GDP ratio. The model extrapolates from historical behavior, and the relationships among the variables would likely change under a scenario in which the market prices greater risk of unsustainable public debt and policy responses seek to avoid it.

# Dealing with post-COVID EM debt

Kevin Daly, Clemens Grafe and Tadas Gedminas argue that the virus-driven rise in EM debt will require large fiscal adjustments

Although the COVID-19 crisis is a global phenomenon, Emerging Market (EM) economies are in a weaker position than Developed Market (DM) economies to absorb its fiscal costs.<sup>2</sup> In DM economies, with credible institutional frameworks and relatively developed financial markets, most governments can run substantial government deficits without driving interest rates and inflation higher. For EM economies (with the notable exception of China), in contrast, borrowing constraints are more likely to be binding, especially in a world where DM governments will also be borrowing heavily.<sup>3</sup>

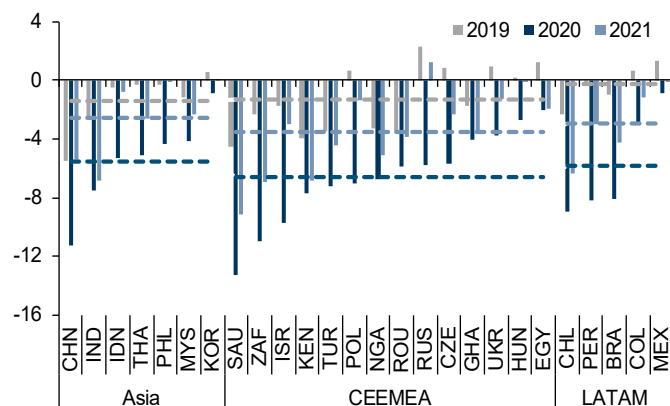
All told, we expect median EM government debt to rise by around 10pp of GDP as a result of the crisis, leaving most EM economies facing painful post-crisis adjustments. But in terms of the post-crisis fiscal picture, we expect a strikingly wide range of outcomes across EM economies: while South Africa, Saudi Arabia, Brazil, and much of Sub-Saharan Africa are likely to require sharp fiscal adjustments to stabilize their debt levels down the road, most of Asia, Russia, the CEE-3 and Peru appear likely to be able to do so with more manageable adjustments.

## A large fiscal impact

Considering the discretionary fiscal easing measures announced in response to the crisis and the impact of weaker growth on budget balances, we estimate that primary deficits are likely to widen in Asia from 1.4% of GDP in 2019 to 5.5% of GDP in 2020, in CEEMEA from 1.3% to 6.6%, and in LatAm from 0.3% to 5.8%, with the potential cost of loan guarantees provided in many countries skewing the risk around these estimates towards larger deficits.

## Wider EM deficits ahead

Projected primary balances as % GDP, dashes show regional averages



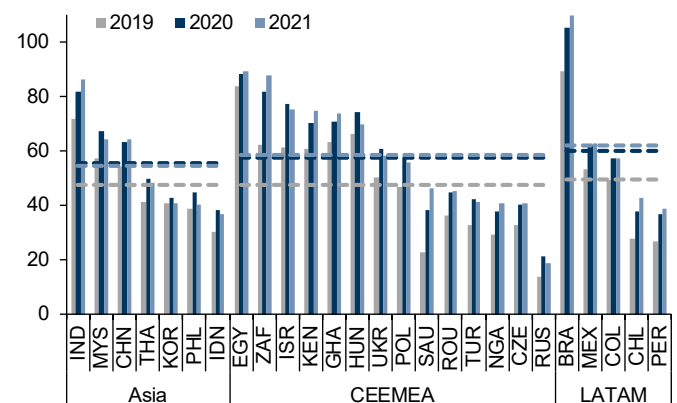
Source: IMF, Goldman Sachs Global Investment Research.

In 2021, as the impact of discretionary fiscal easing measures drop out, we expect primary deficits to improve on a sequential basis but remain materially wider than pre-crisis levels.

Unsurprisingly, the largest deteriorations in fiscal balances are likely to take place among oil producers given the sharp decline in oil prices, including Saudi Arabia, Nigeria and Russia. In CEEMEA, we also expect deficits to widen considerably in South Africa, Israel, Kenya and Turkey. In Asia, the largest fiscal deterioration is likely to occur in Thailand and China, reflecting a large discretionary easing in these economies. And in LatAm, we project the biggest primary deficits in Chile, Peru and Brazil.

## Debt levels surge in India, Brazil, Egypt and South Africa

Projected gross debt as % GDP, dashes show regional averages

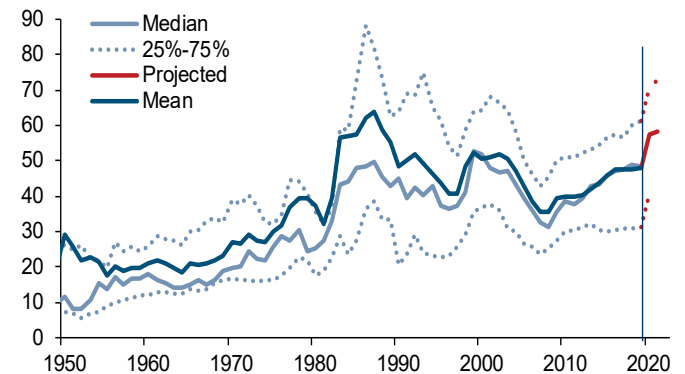


Source: IMF, Goldman Sachs Global Investment Research.

In terms of gross government debt, we expect the median EM government debt ratio will rise by around 10pp. This is less than the increase expected in the majority of DM economies, reflecting more restricted fiscal space, but would nevertheless drive EM debt ratios in many countries to record highs. Specifically, we estimate that debt/GDP ratios will rise to high levels (>75%) within CEEMEA in Egypt, South Africa, Kenya and Ghana, within Asia in India and China, and within LatAm we see Brazil's debt-to-GDP ratio potentially rising above 100%.

## EM government debt ratios set to rise to record highs

Mean, median and percentiles of EM government debt as % of GDP



Source: IMF, Goldman Sachs Global Investment Research.

<sup>2</sup> EMs face additional economic challenges relative to DMs, notably that the crisis is likely to result in a reduction in a number of foreign sources of income, upon which many EMs are especially reliant. These include reduced income from tourism and commodities, and a sharp falloff in remittance flows to EM economies owing to the lockdowns imposed in DM economies. On a more positive note, viral transmission rates and COVID-related deaths have been materially lower on average in EMs than in DMs, possibly owing to the effect of climate on transmission and the younger age structure of these economies.

<sup>3</sup> While many EMs have overcome the "original sin" of borrowing predominantly in DM currencies—a factor that has historically raised credit risks in times of stress—they still face what Carstens and Shin (2019) have described as "original sin redux": because the majority of investors in EM local currency markets still have their performance judged on a USD basis, this can result in capital flight in times of stress, with the result that borrowing costs in many EMs remain pro-cyclical, even if credit risk is contained. See "Emerging Markets Aren't Out of the Woods Yet", Carstens and Shin (2019).

### Difficult fiscal adjustments ahead

What fiscal adjustments will EM economies require following the COVID crisis to put themselves back on a sustainable fiscal footing? While government debt levels in EMs are likely to rise by less than in DMs, the implications for fiscal policy in the long run could be more severe for EMs as real borrowing costs could rise rather than fall.

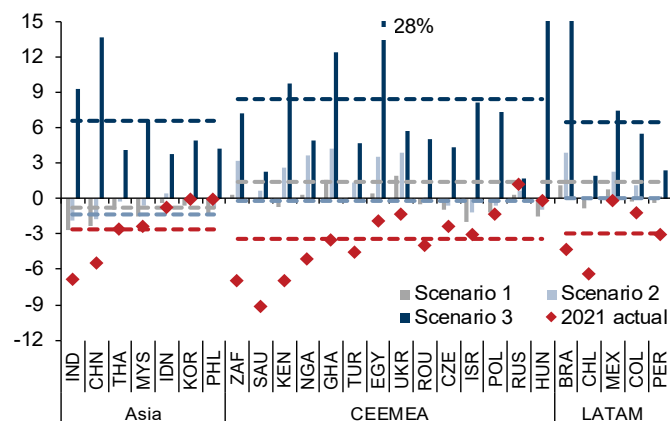
We estimate the primary balances required by EMs to stabilize debt in the aftermath of the crisis under three different scenarios, which we view as spanning the range of potential outcomes:

1. Real borrowing costs return to 2019 levels and trend growth is in line with pre-crisis expectations.
2. The increase in real borrowing costs since the start of the crisis persists and trend growth is 1 percentage point (pp) lower than pre-crisis expectations.
3. Private debt markets are essentially closed to EMs.

We find that most EM economies will face a painful adjustment of fiscal balances in the aftermath of the COVID crisis, but that the required fiscal adjustments vary substantially between countries. Under the middle of the three scenarios set out above, our estimates imply that Asian primary balances will need to adjust from -2.6% to -0.7% (a fiscal tightening of 1.9pp), that CEEMEA primary balances will need to adjust from -3.5% to +1.5% (a much larger tightening of 5.0pp), and that LatAm primary balances will need to adjust from -3.0% to +1.5% (4.5pp).

### Large adjustments needed to stabilize EM debt

Required primary balances under different scenarios, % of GDP



Source: IMF, Goldman Sachs Global Investment Research.

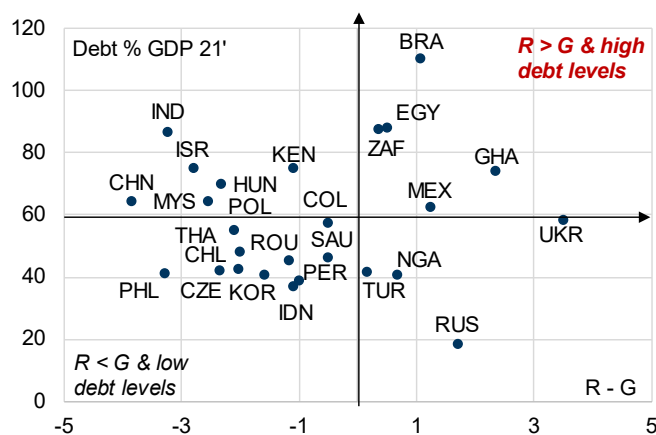
Six countries will likely need to make especially painful adjustments relative to the projected 2021 outcome: South Africa, Saudi Arabia, Kenya, Nigeria, Brazil and Ghana. Three of these economies—Saudi Arabia, Nigeria and Ghana—are highly dependent on oil revenues and the size of the eventual adjustment is ultimately likely to hinge on oil market conditions. For South Africa and Kenya, the large estimated adjustments reflect relatively loose fiscal policy in recent years. The large estimated adjustment in Brazil reflects a high starting debt level.

But the news isn't all bad: all countries in the Asia region will likely be able to sustain post-2021 debt levels while running

primary deficits, and many countries should be able to stabilize debt without large adjustments, including Russia and CEEMEA's low-yielders (with the exception of Romania). These positive stories reflect a combination of favorable real-rate and growth differentials and/or relatively contained increases in debt levels. India is a case in point in this regard: although India's debt-to-GDP ratio is projected to rise to an estimated 85%, we expect that it will be able to sustain its debt while running a primary deficit, as long as it can maintain its growth performance and real rates do not rise significantly.

### Largest adjustments required where $R > G$ and debt is high

Risk-free rate minus growth rate, x-axis; debt as % GDP in 2021, y-axis



Source: Goldman Sachs Global Investment Research.

### Post-COVID: A difficult and risky adjustment for many, but not for all

On net, placing government debt on a more sustainable path in the aftermath of the crisis will require painful fiscal adjustments for many EM economies. Developed economies also face this prospect but are more likely to be afforded greater time to make these adjustments, and to maintain low borrowing costs while doing so. By comparison, EM economies are more likely to struggle to fund their increased borrowing needs at low rates, especially in a world where all governments are attempting to borrow much larger sums.

Many EMs will likely have to access support from the IMF and other international financial institutions (IFIs) before this adjustment is complete, and the IMF has reported that a large number of countries have already requested its help. We expect that number to grow.

For financial markets, one striking result is the range of outcomes suggested by our analysis, both across and within regions, a result that argues in favor of greater cross-country differentiation among EM assets.

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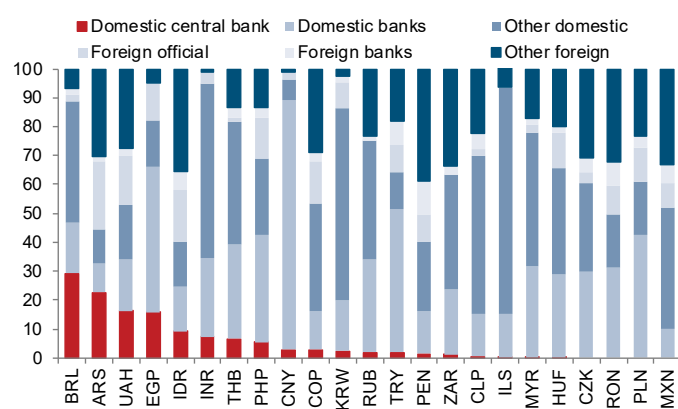
# EM local debt issuance: what are the risks?

Kamakshya Trivedi and Davide Crosilla discuss which investors can take the other side of the surge in local debt issuance in EM economies

EM issuance is forecast to more than double from 3% of GDP to over 6% on average to fund coronavirus deficits (see pgs. 14-15). A key question is whether this additional issuance can be absorbed without a significant cheapening in bond prices (or an increase in bond premia), or even a fiscal crisis. This question is especially pressing in a world where debt issuance will be elevated everywhere and foreign buyers of local government debt may be unwilling to increase their ownership.

## Who will take the other side of EM local debt issuance?

Ownership of government debt as of year-end 2019, %



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

To answer this question, we assess the depth of potential demand for local debt issuance among key domestic institutional players in EM economies: (i) domestic pension funds and insurance companies, (ii) commercial banks and, (iii) central banks. EMs where these three “lines of defense” are stronger should be better placed to get through the issuance surge without a significant cheapening in bonds and, all else equal, make for better local fixed income investments than those where these lines of defense are weaker.

### 1st line of defense: Pension funds and insurance companies

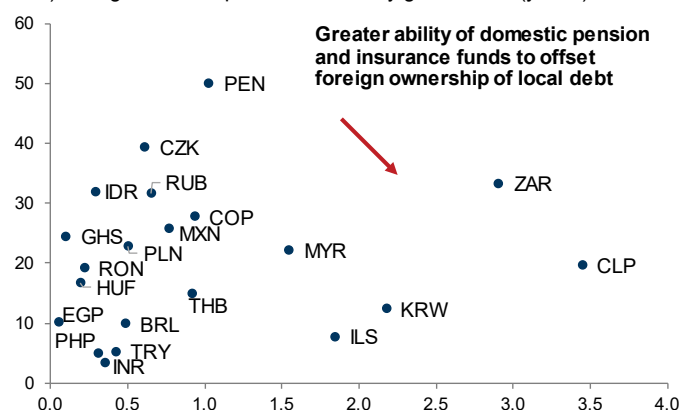
Pension funds and insurance companies are the most natural buyers of local currency denominated government bonds, since their liabilities are often long duration and also local currency denominated. It is perhaps not surprising that Israel, Chile and South Korea—what we often refer to as the “DMs of EM”—have some of the largest domestic savings institutions. But probably less expected is the fact that South Africa has one of the largest pension fund and insurance sectors relative to GDP. The pension and insurance sectors in Turkey, Indonesia and the frontier EMs, including Nigeria and Egypt, are among the smallest, while those of Brazil, Colombia, Mexico and India are somewhere in between.

Together with the size of the domestic savings industry, it is also important to consider the degree to which these institutions can step in to absorb domestic bond supply if foreign investors decide to reduce their holdings. Across Chile, South Korea, Israel—and, to a lesser degree, Malaysia and Thailand—the depth of the domestic institutional investor

community is coupled with relatively low levels of foreign ownership of local debt. Despite the higher foreign involvement in Chile compared with Israel, the offsetting foreign investments held by domestic institutions are significantly larger in Chile. In other markets, like Peru, the Czech Republic, Indonesia and frontier economies, foreign investors play a larger role in shallower domestic markets. Within this group, Peru’s institutions have a larger stock of assets denominated in foreign currency or invested abroad as a counterweight compared with the Czech Republic. In South Africa, large foreign exposures of domestic institutional investors can play an offsetting role when domestic assets or the currency lose value given a regulatory cap on foreign investments.

### Pension funds and insurance companies—a counterweight to foreign positioning

(Pension assets + insurance companies)/local currency gov’t debt (x-axis); foreign ownership of local currency gov’t bonds (y-axis), %



Note: The total stock of government debt is used for frontier markets. Source: OECD, IMF, ADB, RBI, Haver Analytics, Goldman Sachs GIR.

### 2nd line of defense: Local banks

While pension funds and insurance companies are the most natural buyers of long-term government paper, local commercial banks may be more elastic buyers. Broadly speaking, EM bank holdings of government debt tend to be counter-cyclical, increasing when foreign investors reduce their ownership of the local debt markets, and vice versa. This is arguably the consequence of local banks often being the main counterparty for foreigners divesting their holdings, but also of the likely increase in coordination with policymakers in periods of market stress and growing fiscal needs. Indeed, local bank holdings of government paper tend to be most clearly counter-cyclical in those markets where other institutional investors have limited resources to fill the void left by foreign outflows.

EM low-yielders, including China, South Korea, Thailand and the Czech Republic, are among the best equipped to deal with increased debt issuance from this point of view, either because their banking sectors are large, or because their banks tend to respond more counter-cyclically. Among the EM high-yielders, Brazil has a large and responsive banking sector, but in most other such places the size of this sector is smaller relative to GDP, although it is fairly elastic even in the cases of Indonesia and Turkey.

### The last line of defense: The central bank backstop

During the coronacrisis, central banks have had to step in as liquidity provider of last resort in most government bond



markets (including the US and the Euro area). Within EM, these actions have mainly been a response to short-term fund outflows that were threatening the functioning of local markets, and in general the size of announced and actual asset purchases across EM central banks has broadly been contained relative to the QE measures taken in the DM space.

While market functioning has now somewhat normalized across most of the main EMs, it is possible that the upcoming surge in primary supply could reignite price volatility, especially if foreign engagement remains constrained and the domestic investor base is limited. Thus, it is important to understand which EM central banks have room to increase their market presence beyond providing limited short-term liquidity.

In theory at least, a central bank can buy local currency denominated government securities without limit; but, in practice, such an approach is likely to be risky in places where central bank credibility may be limited. A larger balance sheet can be a source of additional market risk for a central bank's profitability, which, in the worst case scenario, can eventually translate into higher fiscal costs or increasing inflation risk through the monetization of incurred losses. We look at three metrics to gauge where government bond purchases or EM QE could be more or less risky: (i) the starting level of central bank holdings of government bonds, (ii) the extent to which local liquid assets are backed by foreign reserve assets and (iii) the degree of likely inflation anchoring.

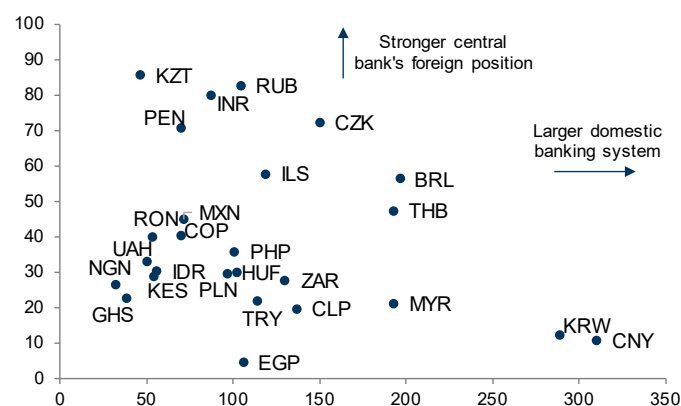
The size of central bank balance sheets across EMs varies considerably, and large balance sheets are generally driven by large foreign reserve holdings (e.g., the Czech Republic), or already large government debt holdings (e.g., Brazil). It is likely no surprise that countries with the highest share of central bank holdings include Argentina and other frontier economies (Egypt, Nigeria and Ukraine) where private sector sources of demand are scarcer. Countries at the lower end of the spectrum in terms of balance sheet size include Chile, Indonesia, Mexico and South Africa.

Central banks can mitigate the risk from government bond purchases by offsetting or "sterilizing" the purchases—either by buying back local currency and selling short-term bills (as in an operation "twist") or by using foreign reserves. In assessing the extent to which local liquid assets are backed by reserve assets—a gauge of a central bank's ability to offset government bond purchases in this way—we find that sizable central bank foreign assets in India, Russia and the Czech Republic arguably leave room for policy makers to grow their domestic holdings, while in markets like Indonesia such actions look riskier.

Finally, central bank buying of government bonds is likely riskiest in countries where inflation expectations are becoming unanchored to the upside. For all their other vulnerabilities, inflation is relatively well anchored in Indonesia and India, whereas risks are highest in the frontier space and Turkey. The most tangible current example of the last line of defense being utilized is in Argentina, where the central bank is being forced to finance the fiscal effort with insufficient resources.

### Strong domestic bank and central bank balance sheets will differentiate where backstops are reliable rather than risky

Total assets of banking institutions (x-axis), % of GDP; Central bank net foreign assets (y-axis), % of M2



Source: Haver Analytics, Goldman Sachs Global Investment Research.

### Different EMs, different risk profiles

Putting all this together, we identify clusters of countries in terms of their ability to absorb local debt issuance without a major market repricing or fiscal crisis:

- **Low risk (South Korea, Israel, Chile, Thailand, the Czech Republic):** countries with some of the largest long-term savings institutions, significant pools of foreign asset holdings, or a relatively large and elastic commercial banking sector that should be able to absorb the increased issuance.
- **Medium-to-low risk (Colombia, India, Mexico, Russia):** countries which sit within the average of the metrics described above, but have either low foreign positioning in the domestic markets, large reserves or meaningful foreign investments held by domestic institutional investors.
- **Medium risk (South Africa, Indonesia, Hungary):** countries with a similar risk profile to those of the previous group, but with at least one major source of additional concern, be it the fiscal trajectory (South Africa), large foreign positioning in the local market (Indonesia) or particularly shallow domestic savings markets (Hungary).
- **Medium-to-high risk (Brazil):** Brazil, which has most of the macro weaknesses of South Africa, but does not have the same extensive local savings industry. Low inflation is likely to keep bonds anchored for the time being, but on a medium- to long-term horizon risks could escalate barring a meaningful adjustment on the fiscal front.
- **High risk (Turkey and frontier markets):** countries with shallow local institutional investment markets, relatively small banking sectors and central banks in need of preserving foreign asset buffers to prevent pressures on the currencies. Support from the official sector is therefore likely to be an inevitable ingredient of the financing mix for most of these markets in the months ahead.

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# Q&A on the municipal bond market



Sylvia Yeh, co-head of Goldman Sachs Asset Management's Municipal Fixed Income business, answers questions on the municipal bond market and the fiscal health of US states and localities

*The interviewee is an employee of Goldman Sachs Asset Management (GSAM), not Goldman Sachs Research, and the views stated herein reflect those of GSAM, not Goldman Sachs Research.*

## **Q: What comprises the municipal bond market, and how big is it relative to other debt markets?**

**A:** The municipal bond market includes government or quasi government entities that serve the public: states and cities, utilities, universities, housing projects, mass transit systems, airports, and ports, to name a few. Total outstanding municipal bonds as of the end of April were roughly \$3.7tn, and the municipal bond market has seen very little growth—or even a slight contraction—over the past decade. That compares to the US Treasury bond market, which had about \$18.5tn of debt outstanding as of the end of April and has grown about 155% over the same time period, and the US corporate bond market that had about \$9.6tn of debt outstanding, and has about doubled. So, relative to other debt markets, the municipal bond market is essentially shrinking, especially in comparison to economic growth over the past decade. Looking at fund flows as well as indices, roughly 10% of outstanding muni debt is considered high yield.

## **Q: How has this crisis played out in the municipal bond market compared to past crises?**

**A:** Similar to the Global Financial Crisis (GFC) and 9/11, the current crisis has generated tremendous uncertainty and intense selling pressure across assets. Fear has driven the need to chase liquidity and cash, which has strained market liquidity. Uncertainty is perhaps even greater today because, while everyone is hopeful for a vaccine, the end point of this crisis and how to move forward generally seems less clear.

At the same time, rules and regulations enacted after the GFC to prevent banks from repeating the mistakes that played a role during the GFC have reduced the ability of banks to address liquidity pressures in the current environment. So whereas in 2008-2009 banks were able to build balance sheets and make markets, dealers in this crisis got heavy quickly given reduced risk tolerances and balance sheet constraints, which today's lower rate environment only reinforced. Substantial growth in algorithmic trading has arguably further reduced banks' provision of liquidity in this crisis relative to past crises given that algorithms are easier to unplug than traders.

As a result, in contrast to previous crises, the federal government and especially the Federal Reserve have been forced to provide liquidity. The CARES Act created \$250bn of funding to municipalities—\$150bn to states and \$100bn to hospitals—and the Municipal Liquidity Facility (MLF) established by the Federal Reserve at the end of April provided \$500bn in liquidity. This Fed facility originally provided short-term financing in the form of a two-year loan agreement to the 50 US States, the District of Columbia, and the governments of larger populated counties and cities. It has since been expanded to include cities and counties with lower populations and the duration of the loans have been extended to three years. The municipal bond market has received more direct support than ever, and in all likelihood more is coming.

## **Q: Has the Fed's municipal backstop facility been utilized, and have these actions been sufficient to stabilize the market?**

**A:** So far, the Municipal Liquidity Facility (MLF) has not been utilized, likely because most issuers have been able to borrow in the market at similar or lower levels than those offered by the facility. It is our view that the MLF is meant as a last resort borrowing vehicle. However, the very existence of the facility and, more broadly, the government's commitment to support municipalities and states' recoveries, has substantially boosted confidence in the municipal bond market. At the peak of the volatility, the market sold off by 50bps two days consecutively, which is something I had never seen before in my career. But after Congress and the Fed expressed their support for municipalities, non-traditional buyers began to enter the market, seeing value in tax-exempt bonds that were trading at yields 2-4 times Treasuries with comparable maturities. As a result, the market has rallied back to levels we started the year with.

## **Q: Just how indebted are municipalities in reality?**

**A:** I think municipalities have gotten a bad rap in this regard. The reality is that over the last decade the growth in municipal debt has not kept pace with the economic growth of states, on average, so on a relative basis state debt has contracted. Furthermore, states and localities came into this crisis with stronger balance sheet positions than in the last recession. The majority of states and localities are therefore only experiencing temporary liquidity issues brought on by the crisis, not long-term fundamental or structural issues. That said, states will face a somewhat more challenging period ahead, with one study [pointing to](#) a roughly \$350bn total budget shortfall for fiscal year 2021 compared to a peak shortfall of \$230bn during the GFC.

**Q: So how risky are municipal bonds today?**

**A:** Prior to October 2007, the municipal bond market was largely a rates driven market given the market's acceptance and credit dependence on municipal bond insurance. In the midst of the GFC, muni insurers lost their AAA ratings, which thus introduced credit volatility. The muni market began to price in credit risk, which continued for several years until the favorable change in the tax code and the strong demand for high-quality assets in a low interest rate environment caused credit spreads to contract. The market dislocation caused by the coronavirus pandemic changed the supply and demand dynamics of the past few years and spreads justifiably widened.

That said, there will clearly be differentiation between the high-grade, medium-grade, and high yield segments of the market. The super high-grade segment of the market has received strong bids from non-traditional buyers like banks, insurance companies, and hedge funds. Meanwhile, the bid from normal retail buyers has lessened given the low rates seen in the market. The medium-tier and high yield parts of the muni market have taken longer to recover given the negative performance of high yield debt. Credit funds have been hindered by substantial outflows, which have forced them to sell assets to raise cash.

Importantly, we have begun to see the high yield muni market improve over the last few weeks. The week ended May 22 saw substantial inflows into both high grade and high yield munis for the first time since this dislocation began. But price discovery is still occurring in the high yield muni market.

**Q: All that said, how concerned should we be about muni defaults?**

**A:** States are unlikely to default regardless of their circumstances. Even the most stressed states in the country have broad powers of taxation, budget cuts, and access to the capital markets and MLF. While state revenues from sales and personal income taxes have declined during past recessions, federal grants and aid temporarily increased, which provided offset to these losses.

At the local level, municipalities can offset losses from a decline in property tax revenues by temporarily raising taxes or receiving transfers from their state. However, even with that reprieve, localities tend to default more than states. This is in part because municipalities are generally less sophisticated and more prone to errors in judgement, as was the case in the 1994 Orange County default. That said, as we saw with both the 2011 Jefferson County default and the 2013 Detroit default, local municipal defaults are well telegraphed by local financial metrics, debt figures, and credit ratings.

Due to the pandemic shutdown, a few rating downgrades have occurred and we will likely see additional downgrades over time, depending on the length and depth of the dislocation. Lower-rated credits will surely show signs of weakness, though the probability of default remains low. It is important to emphasize that we have not seen a meaningful increase in defaults among highly-rated munis so far, and we don't expect to. We did not see a large increase of municipal downgrades after the GFC recession either, despite dire projections by some market participants. In moments of crisis, people don't spend enough time looking at the true fundamentals of the asset class.

**Q: With that in mind, are municipal bonds something to own or avoid right now?**

**A:** Some credits are clearly distressed, but the majority of the municipal bond market is in very good standing from a fundamental and a credit ratings perspective. We expect ongoing stability in the high-quality space, which should prove resilient in the downturn. Essential service sectors such as power, water, sewers, school districts, and state housing authorities really should not be impacted.

On the contrary, many medium-tier credits like airports, toll roads, mass transit systems, and single site hospitals, will certainly continue to endure significant, albeit temporary, stress from the virus even though the federal government likely will not ignore the troubles of these critical pieces of infrastructure around the country.

The lower-rated and high yield part of the muni market that has less flexibility and room for error will require more caution. That is not to say there is not value to owning such credits, but that investors must have a thorough understanding of their fundamentals. Not all munis are created equal, even within the same sector. Even sectors that have been under significant pressure in recent months such as retirement communities, nursing homes, casinos, hotels, regional trains, shopping centers, and resource recovery plants, contain credits with solid fundamentals that will likely prove to be worthy investments.

# Interview with David Skeel

David Skeel is S. Samuel Arsht Professor of Corporate Law at the University of Pennsylvania Carey Law School and a member of the Financial Oversight and Management Board for Puerto Rico. Below, he argues that a corporate bankruptcy wave is likely to hit soon, and that bankruptcy protection for states would be a useful tool to help manage state financial stresses.

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



**Allison Nathan: Will there be a wave of corporate bankruptcies, and how big could it be?**

**David Skeel:** We don't always get a bankruptcy wave after a big economic shock. For example, the bursting of the dot-com bubble in the early 2000s had little effect on corporate bankruptcy filings. But I do expect a

wave of filings this time around. It's hard to tell just how big that wave will be, but I wouldn't be surprised if filings increase a lot more than they did during the Global Financial Crisis, when they essentially doubled. That's because we've basically shut down the economy for several months, and many businesses have very little extra cash on hand, especially small businesses. Even with government support, a number of these businesses likely won't be able to survive without declaring bankruptcy. More broadly, many firms were already sitting on a significant amount of debt before the coronacrisis, and this is just the type of disruption that could push some of them over the edge. This has already started to happen; J.C. Penney and several other sizable companies that were in precarious positions before the coronacrisis have recently toppled into bankruptcy.

**Allison Nathan: When is the bankruptcy wave likely to hit?**

**David Skeel:** Bankruptcy waves typically hit quickly; corporate bankruptcies begin rising within a few months from the start of a recession and consumer bankruptcies even more quickly, within two or three months after a jump in the unemployment rate, which is the key metric to watch on the consumer side.

**Allison Nathan: What do you look at to gauge the pace of corporate bankruptcies, and what are they showing now?**

**David Skeel:** In terms of quantitative metrics, I tend to look at the numbers compiled by the American Bankruptcy Institute, which has data on corporate bankruptcy filings, but with a bit of a lag. In April, corporate bankruptcy filings were up about 25% from year-ago levels and about 10% from average April filings over the past 5 years. A lot can also be gleaned anecdotally, by looking at things like whether firms are taking extraordinary loans, drawing down lines of credit or hiring bankruptcy attorneys—all of which have seen an uptick in recent months. I sit on the Puerto Rico Oversight Board, which uses a number of bankruptcy lawyers and financial advisors. Clearly, Puerto Rico's restructuring is a huge case, and for several years has been the main show in town, with only a few other big cases at any one time. That's not true right now; firms are deluged with other bankruptcy cases. So that all points to a coming wave of bankruptcies.

From a slightly broader perspective, though, the evidence is more mixed. The second tranche of Congressional funding for small businesses is being taken up more slowly than the first

one. That doesn't necessarily mean that businesses don't need the money, but a lot of money has already gone out the door. And it's unclear whether mid-sized businesses that have so far been excluded from Congressional support programs will have access to the funding they need or not. At the same time, larger firms seem to have sufficient funding from financial institutions, private equity firms and hedge funds. So it's difficult to tell from the overall picture whether things are truly falling apart or whether people like me who have been warning about a coming bankruptcy wave are overstating the problem.

**Allison Nathan: If we do see a bankruptcy wave hit, is that necessarily a bad thing?**

**David Skeel:** No. I must admit that I am somewhat of an evangelist for the American bankruptcy system. When the American approach to corporate bankruptcy was forged during the railroad failures of the 19th century, it was designed to give viable businesses that run into financial distress an opportunity to fix their financial problems and make a comeback. For decades, the American bankruptcy system was unique in this regard. The genius of the system boils down to two simple elements of US bankruptcy law. First, it leaves the managers of a company that files for bankruptcy in charge, whereas in many other countries the managers are kicked out immediately. That means managers can continue to run the business as usual. Second, the American system facilitates the borrowing of money in bankruptcy for firms that are at all viable. So the US system effectively roots for viable firms to remain in business.

**Allison Nathan: But does that always work in practice?**

**David Skeel:** No. The limitation that I'm particularly concerned about right now is that the system works very differently when the courts are congested. Under normal circumstances, two-thirds of small businesses that file for bankruptcy end up liquidating instead of reorganizing, and that number will likely grow even larger if the courts are congested. History suggests that the majority of larger firms will still end up reorganizing rather than liquidating, but reorganization will likely take longer and be costlier when the courts are congested. So, if we get the wave that I expect, we could see a lot of small business liquidations and large firms wallowing in bankruptcy for extended periods, which could be very disruptive.

**Allison Nathan: Given the exceptional circumstances we're facing today, is a total bankruptcy standstill a good idea?**

**David Skeel:** When this crisis first started, I strongly advocated for such a standstill. But the further we get into the crisis, the less helpful I think it would be. Right now what we should be trying to achieve is the equivalent of a yellow flag in auto racing when there's an accident on the road—holding things where they are without allowing anyone to get or lose an advantage. While a total standstill would be helpful for the people or business that are having trouble making their rent or mortgage

payments, the longer this goes on, the more problems it will cause for the people who are counting on those payments. So you need something that balances the role of the debtor and the creditor, and distributes the sacrifices being made across them. A partial standstill or a bankruptcy-like process that entails partial write-downs on some types of payments would make sense right now.

**Allison Nathan: Beyond the private sector, many states are under tremendous financial pressures today. Should the federal government provide further support to states?**

**David Skeel:** The federal government absolutely should be helping out states and localities. This is an extraordinary crisis, and not one that we could have expected any state or local government to prepare for on its own. But in order to avoid bailing out states for past fiscal irresponsibility the assistance should be limited to replacing the revenues lost and costs incurred because of the crisis. Professor Robert Inman and I recently [tried to quantify](#) the coronacrisis-induced hole in state and local revenues, focusing on measures such as lost revenues from sales taxes, lottery fees and university tuition as well as increased unemployment and healthcare expenses. We came up with a number in the \$500-600bn range. So that's roughly what I think Congress should be working toward.

**Allison Nathan: One idea recently floated in Washington is to allow distressed states to declare bankruptcy, which is currently prohibited. But don't states already have enough options to restructure their finances when they need to?**

**David Skeel:** It's true that the tools available to states today to address financial pressures like the ability to increase taxes, cut spending, and renegotiate collective bargaining agreements might be enough for them to muddle through, but there is no guarantee that they will be. I have long advocated for state bankruptcy precisely because there are very real limits to what states can do to restructure their finances absent a bankruptcy option. For example, in many states, pensions cannot be adjusted in any way. Take Illinois; the state Supreme Court has interpreted a constitutional provision protecting pensions to mean that pensions of current employees, even with respect to not-yet-earned benefits, cannot be touched.

Similarly, because the Contract Clause of the US Constitution says that states cannot change or impair contracts, if a state has entered into any kind of contract with another party that refuses to renegotiate it, the contract usually cannot be changed. So bankruptcy would provide states with a greater ability to restructure their finances. And part of the beauty of a bankruptcy option is that even if it were never used, the mere threat of it would increase a state's negotiating leverage when it needs it the most. State bankruptcy would also more broadly distribute the pain of financial distress, which today tends to fall disproportionately on a small number of constituencies, such as service beneficiaries that see reduced funding.

**Allison Nathan: What might state bankruptcy look like?**

**David Skeel:** State bankruptcies would likely look a lot like Chapter 11 corporate bankruptcies, consisting of a negotiation among various constituencies, a creditors' committee, and a proposed plan that is voted on and confirmed by the court if it's approved. But there would be a handful of significant

differences between a state bankruptcy and a corporate bankruptcy. The most important difference would be that you would not be able to force a state into bankruptcy involuntarily, as creditors sometimes do with corporations; and the state itself would have to propose the restructuring. Otherwise, you would interfere with state sovereignty and violate the 10th Amendment of the Constitution. And you would not be able to liquidate a state if it doesn't propose a realistic reorganization plan like you could a corporation by converting a Chapter 11 bankruptcy into a Chapter 7 bankruptcy. So that's an important stick that wouldn't be available. Finally, you wouldn't have a shareholder class in state bankruptcies that could be wiped out like you do in corporate bankruptcies. So a state bankruptcy would be a bit more complicated than a corporate bankruptcy, but many of the differences are already reflected—and generally work well—in the municipal bankruptcy process.

**Allison Nathan: So, you don't think any of those steps would violate state sovereignty, which seems to be a key political sticking point in allowing state bankruptcy?**

**David Skeel:** No. State bankruptcy law could be drafted in a way that addresses the concerns around state sovereignty as well as legal concerns around the Contract Clause. In particular, I would make clear that a bankruptcy judge would have no power to interfere with the taxation functions of a state by, for example, requiring a state to raise its taxes, or to pass judgement on what a state does with its tax revenues. If you added in such language that prohibited interference with state decision making, a state bankruptcy law would clearly be constitutional in my view.

**Allison Nathan: What do you make of the argument that if you gave states the option to file for bankruptcy, they would lose their ability to borrow in the municipal market?**

**David Skeel:** That objection to state bankruptcy drives me crazy because it is one of the most oft-cited but also one of the weakest objections, for three reasons. First, it seems to imply that the municipal bond market can't distinguish between a good credit risk and a bad credit risk. Everything we've seen suggests that assumption is wrong, and you don't have to look far for evidence of that. Recently, both Utah and Illinois issued bonds, but while Utah was able to issue at 40bps above the 5y Treasury yield, Illinois issued at 525bps above the 5y Treasury yield, because the market knows that Utah is a really good credit risk and Illinois is a bad one. Putting a bankruptcy law in place is not going to change that. Second, to the extent that a bankruptcy option would have any effect on bond prices across the board, it seems to me that effect would exist because you would be removing or significantly reducing the likelihood of a federal bailout of a troubled state—a distortion that we're better off not having because it reduces the pressure on a distressed state to act in a fiscally responsible manner.

And third, if a state bankruptcy law would destroy the market for state debt, why has the market for city debt not collapsed? Cities have been allowed to file for bankruptcy with the permission of their state since the 1930s, and the limited evidence we have suggests that there's very little effect on bond prices from being in a state that allows its cities to file for bankruptcy as opposed to one that doesn't. So the market collapse argument just doesn't hold water.

# Corporate defaults: should we worry?

Lotfi Karoui argues that corporate defaults are set to pick up to recessionary levels, and sees risk of a more damaging bankruptcy wave

The sudden stop from the coronacrisis has inflicted severe costs on firms large and small, raising concerns about the prospect of a possible corporate default and bankruptcy wave and its implications for the economic recovery. Indeed, the recent capitulation of several large firms in the Retail and Energy sectors, to name a few, have only fueled these concerns. In assessing the risks of a rise in corporate defaults, we set the record straight on two common misconceptions: that the Fed's Corporate Credit Facility will result in a materially milder default cycle (it likely won't); and that defaults equate to liquidations, with companies going out of business for good (they mostly don't).

That leaves us to expect that a severe default cycle on par with past recessions lies ahead, but with the majority of capitulating large companies likely emerging stronger as a result. But we do see risk that a more prolonged cyclical downturn could lead to a lengthier default wave and a higher rate of liquidations, even among large firms, than in the past, which could amplify the depth and duration of the downturn itself.

## Correcting two misconceptions

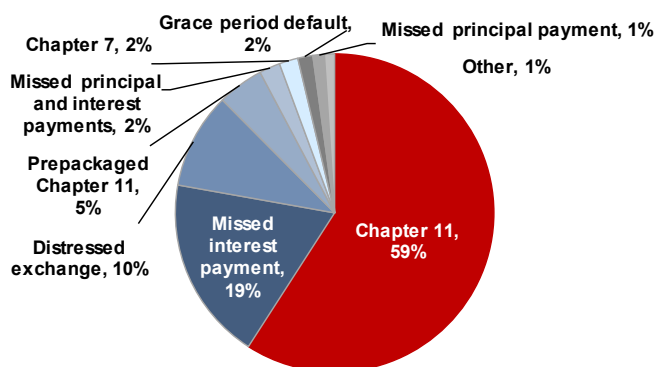
### Misconception #1: Fed actions mean a mild default cycle

One popular belief among many market participants is that corporations only default if they have a large upcoming bullet payment that they're unable to refinance. The recent rebound in primary market activity following the Fed's announcement of the Corporate Credit Facilities has therefore fueled optimism that businesses' improved ability to roll over existing debt will result in a milder default cycle.

In our view, the Fed's Corporate Credit Facilities have unquestionably reduced the risk of rising defaults among creditworthy companies, or what Fed Chair Powell has called "avoidable insolvencies." But more so than the inability to service debt, the default decision is usually a strategic one, generally reflecting the realization by management teams that restructuring has become the only viable solution to repair their balance sheets given persistent challenges that have led to unsustainable company debt dynamics.

### Inability to roll over debt drives a small fraction of defaults

Defaults among rated-firms by category, 1988 - today



Source: Moody's, Goldman Sachs Global Investment Research.

### Misconception #2: Defaults usually end in liquidations

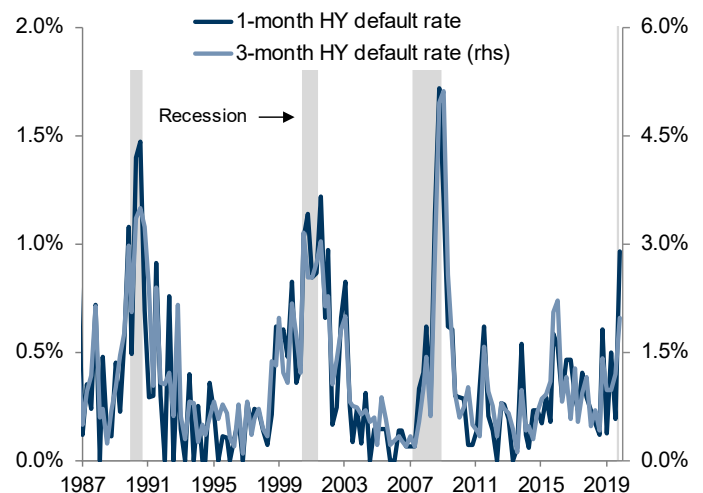
Another common misconception is that corporate defaults generally lead to business failures and liquidations, a damaging outcome not just for companies but also for the broader economy. While the bankruptcy process in the US can result in liquidation, via a Chapter 7 filing, this outcome is fairly rare among large companies that rely on debt capital markets. Instead, the majority of defaults result in restructuring, either in court via a Chapter 11 filing or out-of-court via a distressed exchange. In both cases, companies do emerge from the reorganization process, often with stronger balance sheets than before declaring bankruptcy. In fact, the spirit of Chapter 11 of the US bankruptcy code is to allow companies to seek the protection of the court from its creditors and preserve jobs while reorganizing their businesses.

### More defaults ahead

So how bad will this default cycle be? So far, high frequency default rates have increased to their highest levels since the onset of the New Oil Order in 2015/2016. We expect this trend to accelerate in coming months, pushing the 12-month trailing default rate to 13% by year-end from 5.4% as of the end of April. This is on par with default rates during previous recessions, with the default rate during the 2008/2009 Global Financial Crisis (GFC) peaking at 14% in early 2009 before quickly declining.

### High frequency default indicators have picked up recently

1- and 3-month default rates among US high yield-rated firms, percent



Source: Moody's, Goldman Sachs Global Investment Research.

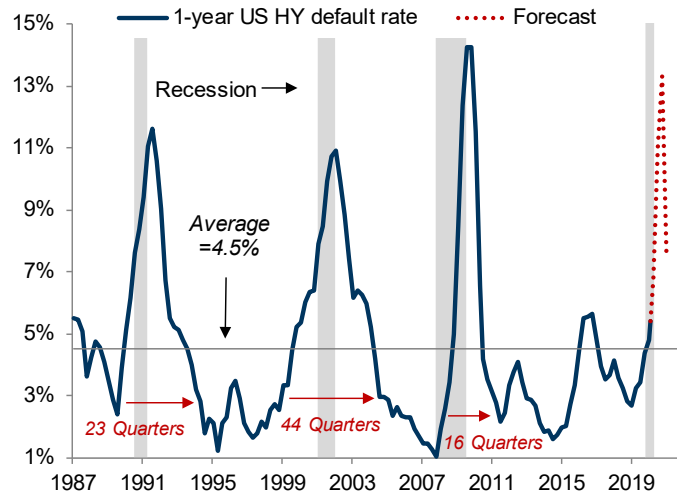
And as in previous downturns, we expect defaults will be concentrated in sectors most exposed to the business cycle as well as those sectors already facing secular challenges. For example, Retail comprised the lion's share of defaults following the Savings & Loan crisis in the late 80s and early 90s and the ensuing collapse of the commercial real estate market. Telecom was severely hit in the 2001/2002 recession following years of over-investment that led to significant excess capacity and inefficiencies. And Media and Autos—two sectors highly exposed to discretionary spending—also accounted for a large share of defaults in both the 2001/2002 and 2008/2009 cycles.

On top of these normal cyclical and secular considerations, we see a couple of additional factors driving the sector

composition of defaults in this cycle, including particular exposure to the sudden stop in the economy, and especially to “social distancing” restrictions, as well as to commodity markets, especially Energy. As a result, we expect defaults will be heavily skewed towards Energy, Retail, Autos/Rentals, Gaming/Lodging/Leisure, and Wirelines, which together account for 40% of the total face value of the USD high yield market.

**HY default rate to rise to 13% by year-end**

US 1-year HY default rate, percent; GS forecast



Source: Moody's, Goldman Sachs Global Investment Research.

**Risks: A more persistent and damaging wave**

While we largely expect this default cycle to look like previous ones, we acknowledge that the severity of the downturn and significant uncertainty that still lies ahead as economies around the world continue to reopen suggests risks of a persistent and more damaging wave. Specifically, should the economic recovery prove more sluggish than expected, the persistent stress on balance sheets could leave an elevated pace of high yield defaults, not just in 2020 but even into 2021 and beyond.

We find that the interaction of balance sheet leverage and liquidity is one of the primary drivers of the recovery of high yield default rates to trend levels. For example, the combination of elevated leverage and low coverage ratios largely explains the slower reduction in the pace of high yield defaults that followed the 2001/2002 recession relative to the aftermath of GFC, even though the latter recession was much more severe than the former. This suggests today's low funding costs and the relatively healthy debt-servicing capacity of high yield-rated companies (at least vs. the late 90s) should allow defaults to decline in 2021. But given the unique nature of the current shock, the risk of a more persistent default cycle is far from negligible.

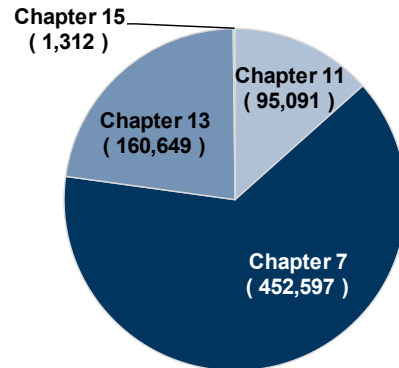
Second, even if the recovery is not slower than we expect, its severity and speed—as well as the extraordinary hit to specific sectors—could lead to an exceptionally high number of liquidations among large firms, not just small businesses, where liquidations are typically concentrated. For some parts of the economy, the current shock will likely prove transitory as the reopening of the economy removes supply constraints and brings back demand for goods and services. But for those sectors that have been directly impacted by social distancing measures, such as Retail, Hotels and Leisure, the risk is high that demand will likely remain depressed for quite some time.

More generally, expectations of permanent disruption to economic activity could end up amplifying and lengthening the current demand shock. This would, in turn, constrain fundamental upside over the medium term, potentially forcing managements to liquidate struggling businesses instead of reorganizing them.<sup>4</sup> Thus far, defaults among high yield-rated companies have all involved either in-court or out-of-court restructurings, as was the case in previous economic downturns. Whether that remains the case will depend to a large extent on the success of the reopening of the economy and the strength of the economic recovery.

**Liquidations more common among smaller firms**

Breakdown of business bankruptcies since 2007 by type, percent

**Total count of bankruptcies (2007-current)**



Note: Chapter 11, 12, and 13 are all forms of “reorganization” bankruptcy while a Chapter 7 bankruptcy is a liquidation. Chapter 13 is available for individuals, and Chapter 11 is available for businesses. Chapter 12 is for some specific businesses.

Source: American Bankruptcy Institute, Goldman Sachs GIR.

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<sup>4</sup> For example, a recent academic paper by Veronica Guerrieri, Guido Lorenzoni, Ludwig Straub and Iván Werning argues that the supply shock caused by the COVID-19 pandemic could trigger a decline in aggregate demand that is larger than the shock itself, making standard fiscal stimulus less effective.

# An update on business bankruptcies

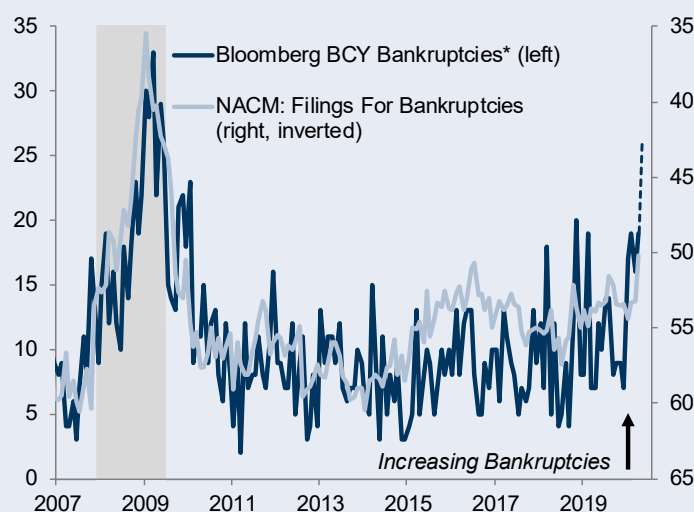
A key determinant of the duration of the recession and the eventual pace of economic recovery will be how much long-lasting damage—so-called “scarring effects”—the downturn inflicts on the economy. A primary concern in this regard is the permanent closure of businesses. Recovery will proceed at a much faster pace if restarting the economy is largely a matter of turning the lights back on. But it could be much more sluggish if previously viable companies go out of business due to a collapse in revenues.

For a high-frequency gauge of this potential damage, we would ideally track business closures. But available measures do not distinguish between temporary and permanent closures. So we instead track bankruptcies to assess such scarring effects. In particular, we follow four timely measures of bankruptcies, all of which now have April data and two of which have partial data for May. Overall, these measures point to a moderate increase in bankruptcy activity so far, at least for larger companies:

- **The Survey of Credit Managers** showed an increase in the number of customers filing for bankruptcy to the highest level since 2009, but still well below the peak reached during the Global Financial Crisis (GFC). However, another survey component, the dollar amount of receivables beyond terms, which captures the number of customers who've fallen behind on payments, has surged to a higher level than ever seen during the GFC.
- **The Bloomberg Bankruptcy Dashboard**, which records new bankruptcy cases for companies with liabilities of at least \$100mn, is on pace to reach a post-GFC high in May.
- **The American Bankruptcy Institute's** more exhaustive count of all US commercial business bankruptcy filings fell sharply in April. This measure captures bankruptcies at both small and large firms and provides a breakdown based on Chapter 7, 11, 13, and 15 bankruptcies. Chapter 7 procedures are particularly important because the widespread liquidation of companies that permanently go out of business would be much more damaging to the prospect of economic recovery than Chapter 11 procedures, where businesses can emerge stronger from debt restructurings. The decline in this measure suggests that there has not yet been a surge in bankruptcies at smaller firms, at least through the end of April.
- **Google searches for the term “bankruptcy”**—a very timely indicator that tracked actual bankruptcy activity surprisingly well in the last cycle—rose to a six-year high in May.

## Large company bankruptcies reached post-GFC high in May

Bloomberg BCY bankruptcies (lhs), count; NACM filings (rhs), index

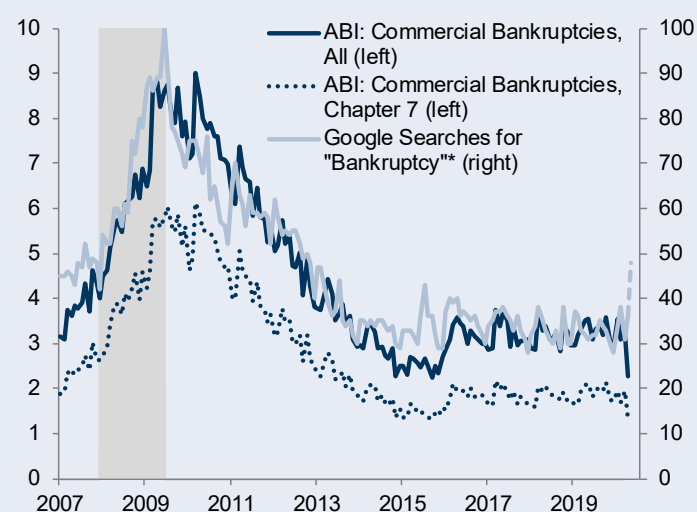


Note: \*May projected using data collected so far for the month.

Source: Bloomberg, National Association of Credit Managers, Goldman Sachs GIR.

## Commercial bankruptcies fell in April, but likely to rise soon

Commercial bankruptcies (lhs), thousands; Google searches (rhs), intensity



Note: \*May projected using data collected so far for the month.

Source: American Bankruptcy Institute, Google, Goldman Sachs GIR.

So far, the number of bankruptcies remains well below levels seen after the last recession, in part because it is still early, but also perhaps due to support from the Paycheck Protection Program. But permanent business closures will inevitably rise the longer the economy remains depressed; the question is by how much.

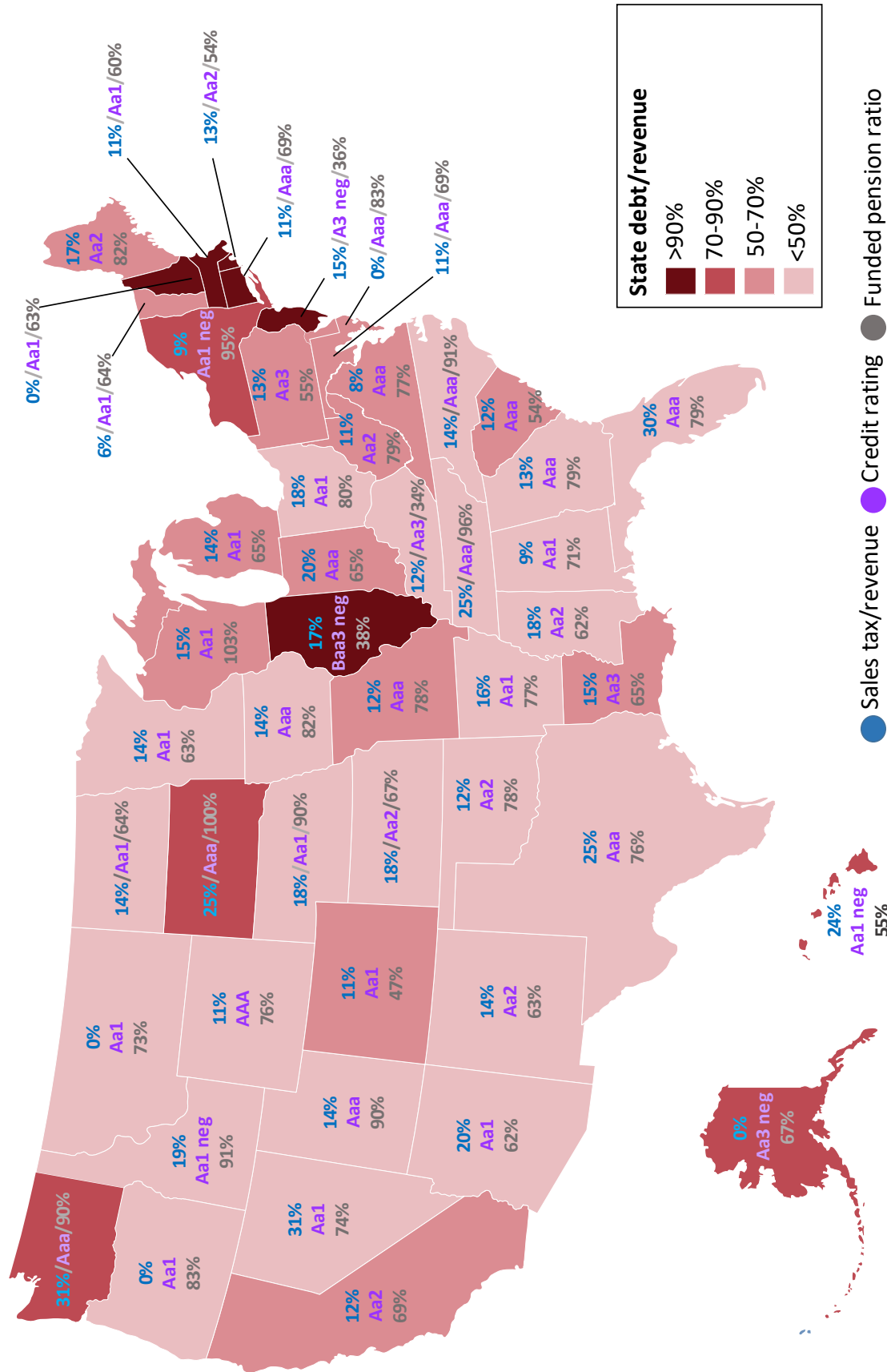
We see signs of trouble ahead for both small and large businesses. In [a survey](#) of thousands of small- and medium-sized businesses on the impact of the virus shock, 31% said that they saw a greater than 50% chance of bankruptcy over the next six months. As for larger businesses, our credit strategists have noted that ratings continue to migrate lower among investment grade companies, building a pipeline that would add to the already sizable wave of “fallen angel” downgrades this year, and among high yield companies. Ratings downgrades often happen both before and after corporate actions involving bankruptcies and liquidations and are sometimes, but not always, a leading indicator.

Overall, the long-term damage to the business sector appears moderate so far, but remains extremely sensitive to how reopening proceeds in coming months.

**David Mericle and Ronnie Walker, GS US Economics Research**



# States of debt



Note: 1 - Sales tax and revenues represent a state's general sales tax collection and general revenues; Alaska, Delaware, Montana, New Hampshire, and Oregon do not have state sales taxes; latest data as of 2017; 2 - Wyoming's credit rating is from S&P as Moody's does not rate the state; 3 - Funded pension ratio represents pension assets to pension liabilities for public sector retirement systems; latest data as of 2017; 4 - State debt statistics do not include unfunded pension liabilities; latest data as of 2017  
 Source: US Census Bureau, Moody's Investors Service, The Pew Charitable Trusts, Goldman Sachs Global Investment Research.

# Summary of our key forecasts

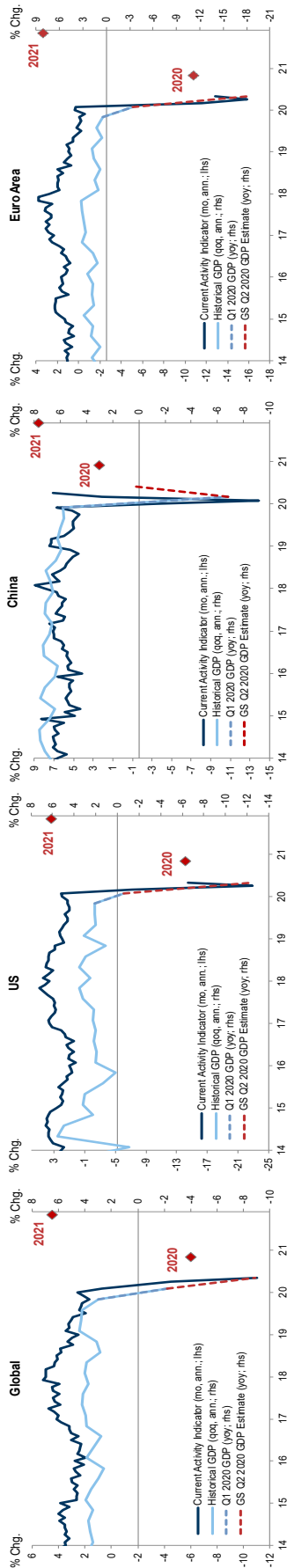
## GS GIR: Macro at a glance

### Watching

- **Globally**, the coronavirus crisis has pushed the economy into a deep recession. We expect real GDP to contract by 4.0% this year, making 2020 weaker than the year following the Global Financial Crisis. But we believe global economic activity has now bottomed, and expect a strong sequential recovery in advanced economies in 2H20, assuming infection rates don't reaccelerate sharply as economies continue to reopen, prompting the reimposition of control measures.
- **In the US**, we expect -39% qoq annualized real GDP growth in 2H following the lifting of physical constraints on economic activity, leaving full-year 2020 growth at -6.3%. We see unemployment peaking at 25% by the end of Q2 and expect a decline in core PCE inflation to just below 1% by year-end 2020. We see risks to our forecasts in both directions: on the upside, China's experience suggests a much quicker pace of recovery is possible, but on the downside prolonged weakness could cause severe scarring effects that delay the recovery.
- **In addition to returning rates to zero and announcing uncapped asset purchases**, the Fed has employed several crisis-era facilities to provide corporates with funding, relaxed capital buffers and reserve requirements, and activated FX swap lines with foreign central banks. We see these steps as sufficient for now to support the flow of credit, and expect the Fed to intervene further if needed. We think the hurdle to a negative funds rate any time soon remains high.
- **In the Euro area**, we expect the coronavirus outbreak will lead to an 11.2% yoy decline in real GDP in 2020 driven by a large 1H contraction. We expect a more differentiated initial economic recovery across countries, with Germany advancing from the trough in activity faster than France, Spain and Italy.
- **The ECB has employed a comprehensive asset purchase program (PEPP)**, and the European Commission has proposed a EUR 750bn Recovery Fund to support the countries most affected by the virus, which we expect will contain sovereign risk in the Euro area in the short run, though longer-term funding dynamics will remain more challenging. We therefore expect the ECB to raise the PEPP envelope at its June meeting, but it is a close call.
- **In China**, despite the government dropping its official growth target for this year, we continue to expect full-year real GDP growth of 3% in 2020, with risks tilted to the downside. We see uncertainty in the domestic recovery path, weak external demand, the possibility of viral resurgence and geopolitical tensions as the biggest risks to our forecast.
- **WATCH CORONAVIRUS**. While the severity of the economic impact from the coronavirus remains highly uncertain, our base case assumes that new infections remain under control as lockdown measures are further loosened in coming months. We see a sharp reacceleration of new infections as economies continue to reopen as the biggest risk to the global economic outlook.

Goldman Sachs Global Investment Research.

### Growth



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

### Forecasts

Economics	GDP growth (%)				Interest rates		FX		Markets		Equities								
	2020	2021	Last	E2020	10Yr (%)	Last	E2021	Last	3m	12m	S&P 500	E2021	12m	YTD	E2020	P/E			
Global	-4.0	-3.0	6.5	4.9	US	0.68	0.75	EUR/\$	1.10	1.08	1.15	Price	3,000	--	S&P500	2.0	-6.0	24.5x	
US	-6.3	-5.7	6.1	3.9	Germany	-0.43	-0.75	-0.40	GBP/\$	1.22	1.23	1.34	EPS	\$170	\$164	MXAPJ	-1.0	-11.0	15.1x
China	3.0	1.8	7.7	8.0	Japan	-0.01	-0.15	0.05	\$/JPY	108	102	105	Growth	55%	30%	Topix	-3.0	-9.0	17.6x
Euro area	-11.2	-7.6	8.1	5.0	UK	0.06	0.45	0.85	\$/CNY	7.15	7.15	6.90	Consumer	2020	2021	STOXX 600	6.0	-18.0	19.1x
Policy rates (%)	2020		2021		Commodities		Credit (bp)		Last		E2020		E2021		Wage Tracker 2020 (%)		Q1		
	GS	Mkt.	GS	Mkt.	Crude Oil, Brent (\$/bbl)	35	30	52.5	USD	IG	178	215	--	US	CPI (% yoy)	Unemp. Rate	CPI (% yoy)	Unemp. Rate	
US	0.13	0.10	0.13	0.11	Nat Gas (\$/mmBtu)	1.7	2.1	3.25	EUR area	HY	643	875	--	Euro area	0.6	9.8	0.8	8.4	
Euro area	-0.50	-0.55	-0.50	-0.56	Copper (\$/mt)	5,227	4,400	6,000	EUR	IG	178	165	--	China	3.7	--	1.6	--	
China	1.50	1.81	2.00	1.94	Gold (\$/troy oz)	1,695	1,600	1,800	Japan	HY	571	695	--	Japan	-0.10	-0.10	-0.12	-2.0	
Japan	-0.10	-0.10	-0.10	-0.12															

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

Market pricing as of May 27, 2020.

# 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.*

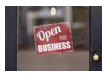
## Goldman Sachs Analyst Index (GSAI)

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.

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