

TOP *of* MIND

STAGFLATION RISK



As 2022 continues to unfold, two major growth risks loom large against a backdrop of alarmingly high inflation—the prospect of a Fed policy mistake, and of a sizable disruption in the Euro area's energy flows. How policymakers navigate these risks, and their growth and market consequences, are Top of Mind. On US policy risk, we speak with Eric Rosengren, former President of the Boston Fed, and our own Jan Hatzius, both of whom agree that policy-induced recession risk in the US has grown. But Hatzius and GS's David Mericle believe that fiscal policy poses the larger recession risk today, and Mericle argues that a US recession would likely be mild. On Euro area risk, we turn to BlackRock's Philipp Hildebrand and GS's Jari Stehn,

who also agree that the prospect of a sharp slowdown in Europe has risen dramatically, but that the ECB has no choice but to press on with policy normalization given the inflationary backdrop, although Stehn anticipates a modest delay. Finally, our strategists weigh in on what this all means for rates and the broader market.



The last two recessions were induced by factors other than monetary policy, but the risk of monetary policy being the cause of the next recession has grown.

- Eric Rosengren

Central banks are set to deliver contractionary shocks to an economy that's already set to disappoint. In such an environment, there's heightened risk that central banks discover that they've pushed the economy below stall speed.

- Jan Hatzius

Stagflation risk is a real concern today... We are looking at a supply shock layered on top of a supply shock. And the nature of the new supply shock—centered on energy—suggests not only that inflation will move even higher and likely prove more persistent moving forward, but also that growth will take a hit.

- Philipp Hildebrand



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

Macro news and views

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

US

Latest GS proprietary datapoints/major changes in views

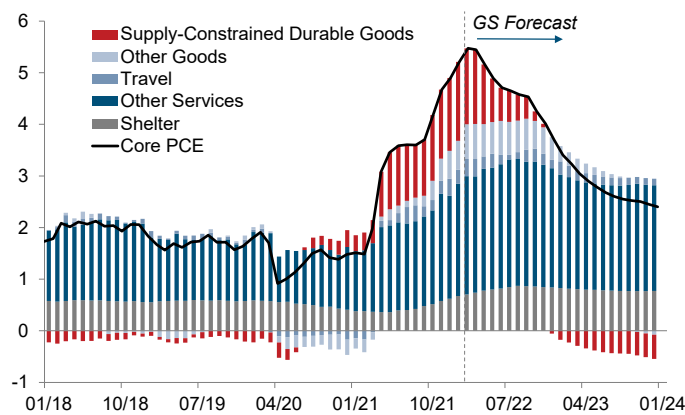
- We recently lowered our 2022 Q4/Q4 GDP forecast to 1.75% on higher oil prices and other conflict-related growth drags.
- We recently raised our YE22/23 core PCE inflation forecasts to 3.9% and 2.4%, respectively, due to increased risks of a wage-price spiral, persistently firm shelter inflation, and less substantial durable goods inflation payback in the pipeline; as a result, we raised our 2023 Fed baseline to four 25bp hikes and our terminal funds rate estimate to 2.75-3%.

Datapoints/trends we're focused on

- Russia risk; we see upside risk to our inflation forecasts and downside risk to our growth forecasts from the conflict.

A higher US inflation path

Contributions to yoy core PCE inflation, % change, year ago



Source: Goldman Sachs GIR.

Japan

Latest GS proprietary datapoints/major changes in views

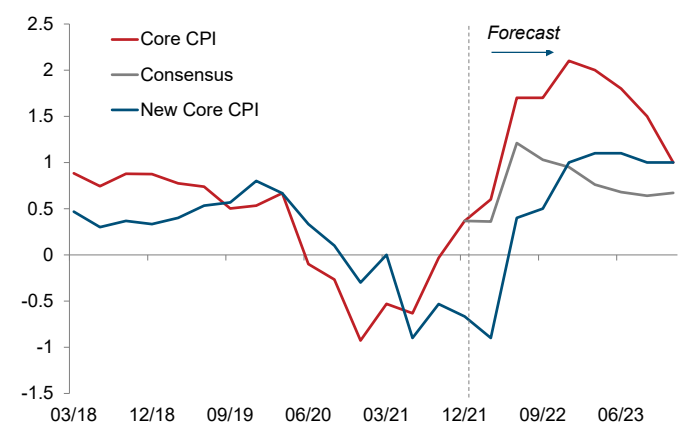
- We recently lowered our CY22 growth forecast and raised our core CPI forecast to 1.5% and 1.5%, respectively, to reflect sharply rising energy prices and our expectation of a conflict-induced global economic slowdown.

Datapoints/trends we're focused on

- Core CPI inflation, which looks increasingly likely to top 2% temporarily in late 2022 due to higher commodity prices, yen depreciation, and the drop out of special factors.
- Yield curve control, which we expect the BOJ to maintain through at least April 2023.

Japanese inflation: above 2%, if only temporarily

Core CPI and New Core CPI forecast, % yoy



Source: Ministry of Internal Affairs and Communications, JCER, GS GIR.

Europe

Latest GS proprietary datapoints/major changes in views

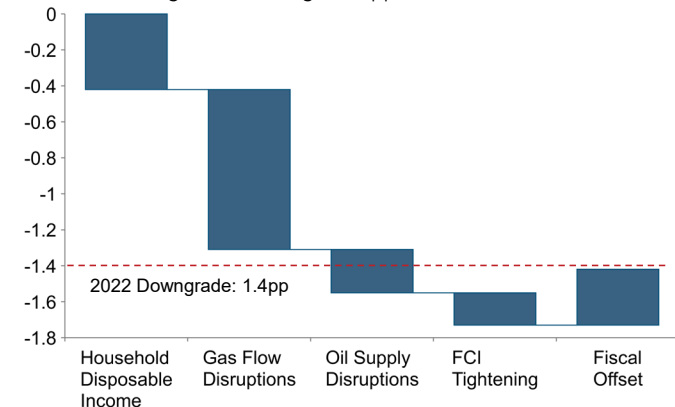
- We recently lowered our 2022 Euro area and UK GDP forecasts by 1.4pp to 2.5% and by 0.9pp to 3.8%, respectively, as the economic fall-out from the war in Ukraine has grown as the conflict has escalated.
- We recently pushed back our expectations for ECB and BoE policy normalization due to the conflict, and now expect the ECB to end net APP purchases in Sept and lift off in Dec 2022 and the BoE to pause rate hikes in May.

Datapoints/trends we're focused on

- Fiscal policy; we expect additional fiscal measures in the EMU-4 and UK due to the conflict-induced growth shock.

A significant Euro area growth hit

2022 Euro area growth downgrade, pp



Source: Goldman Sachs GIR.

Emerging Markets (EM)

Latest GS proprietary datapoints/major changes in views

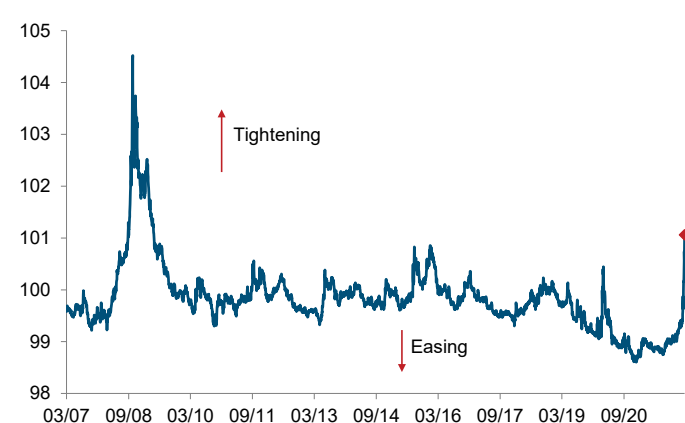
- We lowered our 2022 Russia GDP forecast to -7% following the imposition of the latest round of G7 sanctions.
- We recently lowered our 2022 CEEMEA growth forecast and raised our inflation forecast to 0.3% and 23.3%, respectively, in light of the Russia-Ukraine conflict.
- We recently lowered our CY22 India GDP forecast to 8.3% in light of the conflict.

Datapoints/trends we're focused on

- China Covid restrictions; in the midst of the worst outbreak since Wuhan in early 2020, we expect policymakers to maintain significant Covid restrictions for most of 2022.
- Global FCI, which is at its tightest levels since May 2009.

Financial conditions have tightened substantially

Global Financial Conditions Index (FCI), nominal



Source: Goldman Sachs GIR.

Stagflation Risk

As 2022 continues to unfold, two major growth risks loom large against a backdrop of alarmingly high inflation. The first risk, centered in the US, is the prospect of a policy mistake as the Fed embarks on a tightening cycle to rein in inflation, which was already running at multi-decade highs before the tragic Russia-Ukraine conflict delivered a sizable commodity supply shock. Whether the Fed will be able to pull off a soft landing in such a challenging macro environment—or will instead end up triggering a recession—is a growing question. The second risk, centered in Europe, is the prospect that the Russia-Ukraine conflict deals a crippling economic blow given Europe's dependence on Russian energy, which could see Europe experience a stagflationary period of persistently higher inflation and low (or even negative) growth. How US and European policymakers navigate these risks, and their growth and market consequences, are Top of Mind.

We start by speaking with Eric Rosengren, former President of the Federal Reserve Bank of Boston, and Jan Hatzius, GS Head of Global Investment Research and Chief Economist, who agree that the risk of a monetary policy-induced recession in the US has risen. Rosengren argues that by not pivoting earlier to address inflation, the Fed made a policy mistake that has left it behind the curve. This, he says, raises the risk that it will now have to move faster to bring down inflation, and the faster it moves, the greater the likelihood that its actions cause a recession. For now, he expects 25bp rate hikes throughout the year, and advocates for a greater reliance on shrinking the balance sheet to achieve the tightening needed to address current inflationary pressures. But he believes that uncertainty around the Russia-Ukraine conflict, as well as around Covid, could complicate the Fed's decision-making process—and its ability to achieve a soft landing—in the second half of the year.

Hatzius, for his part, argues that the risk of a recession over the next one to two years has increased as the Fed is set to deliver contractionary shocks to an economy that was already likely to disappoint even before the growth-negative geopolitical conflict began. For now, he's also sticking with his view that the Fed will deliver consecutive 25bps hikes this year—with balance sheet shrinkage running in the background—given that inflation concerns are more pressing than growth concerns in the US. But he believes that the recent geopolitical tensions have tilted the balance of risk around the Fed's actions to the dovish side, by raising the risk of a large tightening in financial conditions, which could compel the Fed to pump the brakes.

David Mericle, GS Chief US Economist, then answers the most oft-asked questions about US recession risk, concluding that the drag from fiscal policy poses a larger risk to US growth this year than monetary policy, and that the direct effects of the war in Ukraine would not be big enough to push the US into recession, but an associated tightening in financial conditions and deterioration in consumer and business sentiment could. So he sees higher risk of a recession this year relative to a normal year. That said, he believes that the scenarios he lays out would likely imply only a mild recession, and the related rise in unemployment would be below that of most recessions.

We then turn to Philipp Hildebrand, Vice Chairman of BlackRock, and GS Chief European Economist Jari Stehn, to gauge the risks of a Euro area recession amid the growth shock

from the Russia-Ukraine conflict, and the implications of a stagflationary environment for ECB policy normalization. Hildebrand believes that stagflation risks in the Euro area have grown sharply in recent weeks as the conflict-induced supply shock comes on top of the pandemic-induced supply shock already in train, likely resulting in even higher, and, importantly, more persistent, inflation at the same time that the economy is facing a large hit to growth. Despite this risk, he says, the ECB, as well as the Fed, have no choice but to press forward with policy normalization given the most dangerous risk today: the potential de-anchoring of inflation expectations.

Stehn agrees that growth risks have grown dramatically in the Euro area, and now expects negative growth in Q2 and only 2.5% growth in 2022, with a downside scenario suggesting a technical recession this year. While he agrees with Hildebrand that the ECB will proceed with tightening, he now sees the first ECB rate hike only in December (vs. September previously).

Beyond these economic projections that suggest a higher risk of recession in the US and especially Europe, is the market itself signaling a recession ahead? Much has been made of the recent flattening and mild inversion in the US yield curve—historically, a relatively reliable indicator of recession risk. That said, Praveen Korapaty, GS Chief Interest Rates Strategist, is currently skeptical about the value of the signal from an inverted curve, given his view that a global duration supply/demand imbalance is depressing long-end yields, which could cause the curve to invert early in the cycle.

In Korapaty's view, 10y UST yields will continue to move directionally higher to 2.25% by YE22, consistent with Hatzius' and Mericle's expectation that the Fed won't tighten materially less given the inflation backdrop. And, while he believes that the stickiness in long-end yields will likely persist for a while, he sees market pricing of terminal rates in the 1.75-2% range—which would mean less restrictive real rates than in the last cycle—as too low—and Rosengren and Hatzius agree.

For his part, Hildebrand doesn't see significant upside for terminal rates from current market levels, expecting them to reach about half the level that they would in a normal cycle. That's because he believes that, given the mostly supply side nature of the current inflation surge, the amount of rate hikes required to sharply reduce inflation would "absolutely kill" the economy. And in an environment in which growth is already slowing, central banks choosing to take such a path strikes him as an impossibility. So the end result will be fewer rate hikes, and central banks ultimately learning to live with higher inflation.

GS market strategists Dominic Wilson and Vickie Chang then look at how broader market pricing has changed as conflict-related growth risks have taken over the driver's seat from monetary policy risks. They conclude that while the market has largely priced in our central growth scenarios at this point, risky assets will likely struggle to perform until the prospect of a more severe downside scenario abates.

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Interview with Eric S. Rosengren

Eric Rosengren is the former President of the Federal Reserve Bank of Boston, serving from 2007-2021, before which he served in various roles at the Bank since 1985. He is currently a visiting professor at MIT. Below, he argues that the Fed is behind the curve in addressing inflation and that the risk of monetary policy causing the next recession has grown as a result.

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



Allison Nathan: You served at the Fed for over three decades. Why was it caught so off guard by the current surge in inflation?

Eric Rosengren: Economists look at historical data to help forecast the future. And when something happens that's not in the historical data, the ability to predict what's going to

happen next becomes much more difficult. We don't have any instance of a serious pandemic in the post-war data, and many econometric models focus on the period from the mid-1980s. As a result, a fair amount of uncertainty about how a pandemic would play out is to be expected. This is especially the case since Covid isn't really one pandemic, but multiple, considering the various variants that are hitting different countries at different times.

While the serial oil supply shocks of the 1970s provide somewhat of a parallel in that they represented a substantial supply shock that proved challenging for both the economy and policymakers, exactly how such a shock stemming from a public health crisis would manifest itself was understandably unclear; for example, nobody expected that the surge in used car prices would persist as long as it has. And conditions more broadly are very different now relative to the 1970s. The amount of leverage in the system and financial innovations like cryptocurrencies and other alternative assets have increased financial stability concerns. The last two recessions have effectively seen runs on money market funds that threatened short-term credit markets. So, the institutional situation today is very distinct and more complex from the situation that Paul Volcker faced when he implemented a sharp hawkish pivot to rein in the high inflation of the 1970s. But just because it's a more difficult situation, policy still needs to focus on improving economic outcomes.

Allison Nathan: Even with the recent hawkish pivot, are you concerned that the Fed remains behind the curve, and that the economy could end up in a wage-price spiral?

Eric Rosengren: The Fed is definitely behind the curve. Inflation is well above 2% both in PCE and CPI terms. The unemployment rate is at 4%, which is below the CBO's estimate of full employment. In such an environment, interest rates should be a little above neutral, which is likely somewhere above 2%. We're pretty far away from that point, so the Fed has a lot of room to catch up. If any mistake was made, it was not pivoting earlier. While it was reasonable to assume that the inflation surge would be temporary in March and April of last year, as we got into late spring and the summer, ideally the Fed would've started to pivot so that it wouldn't have had to shift as abruptly as it has this year. All that

said, I'm not particularly concerned about a wage-price spiral, because I think the Fed will tighten enough to prevent one.

Allison Nathan: With the benefit of hindsight, was 2020 the wrong time to implement a new framework that rejects pre-emptive strikes on inflation in pursuit of the Fed's maximum employment goal?

Eric Rosengren: I don't fault the framework—it was introduced to address the problem that had prevailed for the previous two decades, which was getting inflation up to 2%, and we couldn't have anticipated the pandemic and its economic consequences. But being too reliant on any framework is a problem. For that reason, I viewed the framework more as a communication tool rather than a straitjacket on Fed action. But my guess is that many people viewed it as more of a promise and less of a communications guide. And anytime something that is viewed as a rule encounters an unexpected development that wasn't used to calibrate the rule, you run the risk of a problem. That's exactly what the Fed encountered during the pandemic.

Allison Nathan: So do you expect the Fed to conduct policy with greater flexibility going forward?

Eric Rosengren: The Fed obviously pivoted and is moving more quickly, but policymakers will likely still be concerned about throwing the economy into a recession, especially given the recent geopolitical developments. So the Fed is likely to remain relatively cautious and to continue to move somewhat consistently with the framework to achieve inflation much closer to the target without disrupting the labor market much.

Allison Nathan: The market is pricing a little less than seven Fed hikes this year. Does that seem about right to you?

Eric Rosengren: I expect that the Fed will raise rates by 25bp throughout the year unless the economy slows down more than they anticipate. If the current geopolitical situation deals a severe shock to the economy, that obviously makes what to do a more difficult call. In general, I'd be surprised if the Fed moved in 50bp increments, because if you start moving that quickly, you start worrying that you don't have enough time to analyze how the previous hikes are impacting the economy. So, if policymakers get to the point where they're in effect panicking, which a series of 50bp hikes would suggest, that would risk undoing all of the gains achieved in the labor market—the other side of the dual mandate that the Fed can't ignore—and would significantly raise the probability of a recession in the next two years in my own forecast.

Allison Nathan: Can raising interest rates really be effective in stemming inflation that is driven by supply constraints?

Eric Rosengren: Raising rates obviously does nothing to increase supply, but the core problem is that demand is greater

than supply. And raising rates will reduce demand as fewer people buy homes, cars, and other goods and services. So there's no magic to slowing down the inflation rate—you just need demand to slow down enough so that the amount of goods being produced is roughly equal to the amount that people want to purchase. But that's difficult to predict when the world is so uncertain, which is why the Fed would want to move somewhat cautiously.

Allison Nathan: What's your view on the use of other tools, like shrinking the balance sheet, in reining in inflation?

Eric Rosengren: I personally have a less traditional perspective on balance sheet management that may not be reflective of how the Fed is thinking about it. The last time that the Fed normalized policy, it primarily relied on raising the Fed funds rate. But if the problem today is that supply can't keep up with the demand for goods like houses and cars that consumers purchase using longer-term financing, targeting long-term rates through the balance sheet, rather than short-term rates through the Fed funds rate, may be more effective in containing inflation. 10y UST yields around 2% don't do much to slow the demand for houses and cars. So if the Fed is serious about slowing down the economy to address inflation, a greater role for balance sheet reduction in the Fed's exit strategy would make sense, especially given the large weight of goods like cars and shelter in the CPI.

Using the balance sheet versus the Fed funds rate also has important implications for credit availability that deserve consideration. Since financial intermediaries borrow at the short end and lend at the long end, rapid increases in short-term rates flatten the yield curve and reduce the incentive for financial intermediaries to lend, with low- and moderate-income borrowers most likely to suffer reduced access to credit. If tightening is instead implemented through balance sheet shrinkage, that would steepen the yield curve and increase the attractiveness of lending, so you don't have the same issue with credit availability. So I would personally favor doing more with the balance sheet and less with the Fed funds rate, although I am not sure the Fed is willing to do so.

Allison Nathan: Is there a case for actively selling Treasuries or mortgages this time around?

Eric Rosengren: My personal preference would be to try to maintain a positive slope to the yield curve, and if that requires selling Treasuries and mortgages, then that's what the Fed should do. So, these balance sheet options should be on the table, and, again, the Fed should seriously consider trying to do a bit less with the Fed funds rate and a bit more with the balance sheet, which is very large relative to history.

Allison Nathan: Are there other unconventional tools that the Fed should consider employing?

Eric Rosengren: I'm not sure the Fed needs more tools at this stage. Unconventional tools are usually rolled out during crises, when the Fed needs to get into problematic niches of the market. Today's situation of excess demand relative to supply is a very different problem. And for that, focusing on a handful of tools probably makes more sense than trying to develop new tools. The Fed funds rate and balance sheet management will likely be sufficient to address today's inflation concerns.

Allison Nathan: Market volatility has surged in response to inflation concerns, augmented by the recent geopolitical developments. Is there a point at which market volatility would prompt the Fed to alter its course?

Eric Rosengren: The Fed considers all economic variables as well as what's happening in financial markets, and their goal is to avoid unnecessarily disrupting financial markets. Ideally, financial markets and the Fed are on the same page and the Fed's policies are well explained so that the markets don't have a widely different view than the Fed, which runs the risk of a more disruptive movement in financial markets than is optimal.

Allison Nathan: The market is currently pricing a terminal rate of 1.75-2%—is it right to think that the terminal rate in this cycle will be lower than in the last cycle?

Eric Rosengren: That would not be my best guess for the terminal rate. Settling at that rate would imply that the economy doesn't have a more persistent inflation problem and that inflation will return to its 2% target relatively quickly. This assumes that the pandemic has not altered inflation expectations that are well-anchored at 2%. Even if that's true, you'd probably expect an equilibrium rate higher than that. And if we assume that inflation will take longer to come down to target, real rates would need to be high enough to slow the economy to rein in inflation, and negative real rates won't do much to achieve that. The terminal rate certainly needs to be higher than the inflation target, but how much higher will depend on how difficult it is to temper inflation, and other factors affecting the economy, including fiscal policy and the global market backdrop.

Allison Nathan: Given all that, what's the risk that the Fed can't engineer the soft landing it wants to at this point, and what are you watching to assess that?

Eric Rosengren: The faster the Fed has to raise rates to rein in inflation, the more unpredictable the outcome and the more likely that its actions cause a recession. If we find that structural changes in the labor market following the pandemic or other factors outside of our historical experience require very rapid rate hikes to reduce inflation, then the probability of a recession would rise quite dramatically. I am closely watching labor markets—indicators like initial claims, new hires, as well as wages and salaries, which have been rapidly rising relative to productivity. If that were to continue, and higher wages become embedded in the labor market, I would worry that inflation might settle at a rate much higher than the Fed's target, requiring more aggressive action that might ultimately lead to a larger slowdown in the labor market than is desirable.

I am not concerned that the first set of rate hikes will be problematic in this sense, but the second half of 2022 looks trickier given the uncertainty surrounding the Russia-Ukraine crisis, oil prices, and the prospect of new virus variants. So I think it's pretty unpredictable at this stage, but the faster the Fed moves, the greater the risk. And I would say that the risk of a monetary policy-induced recession is more elevated now than it has been in quite a long time. The last two recessions were induced by factors other than monetary policy, but the risk of monetary policy being the cause of the next recession has grown.

Interview with Jan Hatzius

Jan Hatzius is Head of Global Investment Research and Chief Economist at Goldman Sachs. Below, he argues that the Fed will likely stay the course and deliver seven 25bp hikes despite the Russia-Ukraine shock, and that, while not his base case, the risk of a policy mistake and recession have risen given recent upside inflation surprises, especially strong wage growth.



Allison Nathan: With inflation already running at multi-decade highs, how has the [Russia-Ukraine conflict](#)—which could exacerbate current inflationary pressures while also weighing on growth—impacted your expectations for central bank policy?

Jan Hatzius: It hasn't impacted my expectations much. While it's a massive shock in terms of military and security issues, and horrible on a human level, the impact of the ongoing conflict on the global economy will likely be more limited, barring a severe escalation. There are a few key spillover channels to monitor. First, there's the weight of the Russian and Ukrainian economies in global GDP and their trade with the rest of the world, both of which aren't particularly large. Second, there's Europe's substantial dependence on Russian energy supplies, which could lead to a more sizable impact on Euro area GDP if Russian gas stops flowing and that forces a shutdown of industrial output to keep European houses warm. Third, there's the effect of tightening financial conditions as global markets continue to adjust, which looks moderate outside of Russia so far. And fourth, there's the broader impact to energy and commodity supplies, which has already led to a surge in commodity prices and has consequences for global inflation and growth.

Taken together, the conflict is a stagflationary shock in the sense that it both hits growth and boosts inflation, which have somewhat offsetting implications for Fed policy. So, despite being growth negative directionally, the conflict shouldn't push central banks to do materially less than they otherwise would have given the inflation backdrop. US inflation, in particular, is extremely high relative to history, and so we expect seven 25bp Fed hikes this year, or 175bps of rate increases, and four 25bp hikes in 2023.

“Despite being growth negative directionally, the [Russia-Ukraine] conflict shouldn't push central banks to do materially less than they otherwise would have given the inflation backdrop.”

Allison Nathan: Does the calculus change for the ECB, though, given that Europe is more exposed to the conflict both in terms of growth and inflation?

Jan Hatzius: The shock is far bigger for Europe, and the ECB is also starting from a different place. Rates are still negative in the Euro area, and while inflation has also surprised substantially to the upside, it's more debatable how entrenched inflation actually is in the Euro area compared to the US. Wage

growth hasn't picked up significantly, and the labor market isn't overheating to the same extent. In fact, despite the Euro area unemployment rate dropping to a record low in January, we still think there's some remaining labor market slack. So, we continue to expect the ECB to raise rates somewhat later and more gradually than the Fed, and look for a 25bp rate hike in December. That said, while it's not our base case, a downside scenario in which Russian energy exports are banned would entail a sizable 2.2pp hit to production, and in such a scenario we would expect a technical recession in the Euro area this year.

Allison Nathan: Last time we spoke, you argued that US inflation would gradually subside this year on the back of a normalization in the prices of supply-constrained goods. How have your inflation expectations changed since then?

Jan Hatzius: We still expect significant payback from the normalization of prices in these categories, albeit somewhat less pronounced and a little bit later than we originally anticipated. In particular, we expect the contribution of supply-constrained categories to core PCE inflation to swing from about 155bp year-on-year to -5bp by end-2022 and -45bp by end-2023. But that's working against the acceleration in the more trending components of inflation—such as shelter and other core services—and second round effects working primarily through wages. Wages are growing at a rapid pace of roughly 6% quarter-on-quarter annualized. That should come down gradually as the post-Covid labor market reset continues to play out, but nominal wage growth will likely still be 5% at the end of the year given how scarce workers are relative to the number of available jobs, which implies unit labor cost growth of 3-3.5% after netting out 1.5-2% productivity growth. This should all leave core PCE inflation at 3.9% by end-2022, which is clearly too high from the Fed's perspective.

Allison Nathan: Does the recent sharp wage growth raise the risk of a wage-price spiral?

Jan Hatzius: Yes. The labor market looks far more overheated than I expected 6-12 months ago, especially based on the gap between available jobs and workers. This is a useful indicator because it doesn't rely on any statistical estimates like the unemployment gap, which is the unemployment rate relative to the natural rate of unemployment, but rather compares the total number of available jobs based on employment plus open positions relative to the number of workers in the labor force, and has been a strong predictor of wage growth over the last several decades. Today, jobs outnumber workers by the largest margin since the end of World War II. One reassuring factor is that long-term, forward inflation expectations measures—whether focusing on households, market participants, or forecasters—aren't yet showing signs of a de-anchoring. But it's hard to know how much weight to put on that because forward expectations haven't been observable in many past

cycles. And, in the end, it's clear that the labor market is substantially overheated. Despite a remaining shortfall of 2.2mn jobs relative to the pre-pandemic level, there still aren't enough workers to fill the ample amount of open positions today, and that raises the risk of a wage-price spiral.

Allison Nathan: Given the rising risk of a wage-price spiral, is the balance of risk leaning towards the Fed having to hike more aggressively than you currently expect?

Jan Hatzius: There are certainly some significant upside risks. The Fed funds rate still at zero, inflation far above target, and risk of a wage-price spiral and a de-anchoring of inflation expectations all suggest that the Fed could need to move more aggressively at some point, and potentially in 50bp increments.

On balance, though, I think the downside risks are even more significant, in part because of the massive escalation in geopolitical tensions and the surge in commodity prices. If financial conditions tighten more significantly, say by 100-200bp relative to the 125bp since last year, then it's possible that the Fed could take a pause. In the end, the Fed wants to tighten financial conditions enough to get growth to a trend or slightly below-trend pace without sparking a recession. They don't believe that the economy needs a recession in order to break the current inflationary dynamics, although that could become a reasonable expectation at some point. So, a large tightening in financial conditions could compel the Fed to hit the brakes on rate hikes.

Allison Nathan: To what extent do you expect balance sheet shrinkage to contribute to the policy tightening, and should the Fed consider a larger role for the balance sheet in its exit strategy given the nature of the current inflation pressures?

Jan Hatzius: Our baseline is that the Fed will announce the start of balance sheet reduction in June, and will let Treasuries and mortgage-backed securities run off with caps of \$60bn and \$40bn per month, respectively. That implies that the Fed's balance sheet will shrink by roughly \$2.5-\$3tn over the next three years. Our best estimate for the impact on the term premium and thus long-term interest rates is about 30bp. From an economic activity perspective, we think this is equivalent to about a 30bp hike in the funds rate, or about one-tenth of the impact of the 11 hikes we now expect through end-2023. So we expect the impact of quantitative tightening (QT) on the economy to be fairly limited. That said, the confidence interval around the impact of QT is much larger than an actual hike in the funds rate because there's less of a track record with the effects of QT.

Although the long-end of the yield curve that balance sheet management targets is more directly tied to the economy than the short-end in some ways, given that consumers finance bigger-ticket items with longer-term borrowing and 10y Treasuries are a significant weight in our financial conditions index (FCI), the most clearly overheated part of the economy right now is the labor market, which isn't disproportionately tied to longer-end rates. That, combined with the Fed's lack of

experience with balance sheet operations, doesn't, to me, suggest a strong argument for greater use of the balance sheet in the exit strategy.

Allison Nathan: Does it make sense that the market is currently pricing a lower terminal rate than in the last cycle?

Jan Hatzius: It's always important to remember that markets price the probabilities of a range of scenarios rather than a single path. With that caveat, though, the market is putting a higher weight than I think is appropriate on the prospect of a long-term, zero-rate outcome where the Fed is forced into a policy reversal and has to cut rates. Current market pricing suggests a terminal rate of 1.75-2% vs. our expectation for 2.75-3% by end-2023. I find it hard to write down a reasonable range of scenarios that would justify such a low probability-weighted average.

Allison Nathan: But has the risk of a policy mistake that eventually forces such a reversal increased?

Jan Hatzius: Yes. Our baseline remains a soft landing, with the view that the significant increase in the funds rate that we expect should help slow growth to a roughly trend pace of 2% in 2H23 and then slightly below 2% beyond 2023, and that more people will return to the workforce as health fears dissipate and financial cushions expire, reducing the current overheating in the labor market. But the risk of a policy mistake has increased as the environment has become harder to predict. The magnitude of uncertainty around many of the shocks we're dealing with today are very large. Geopolitical uncertainty will be negative for growth and positive for inflation, but the extent of the impact is less clear. The US will experience a sizable fiscal drag this year, even when accounting for pent-up savings, as many of the pandemic-era stimulus programs end, but whether that will be a one or three percentage point hit to growth is harder to gauge. In this environment, the risk that Fed policy isn't well-calibrated has no doubt risen.

Allison Nathan: So has the risk of a recession also risen?

Jan Hatzius: Yes, the risk of a recession at some point in the next year or two has also increased. Central banks are set to deliver contractionary shocks to an economy that's already set to disappoint. In such an environment, there's heightened risk that central banks discover that they've pushed the economy below stall speed and become victim to the three-tenths rule, whereby increases in the unemployment rate of more than three-tenths of a percentage point from its trough have historically led to recession—a trend that's very clear in the US data and to a lesser degree in other advanced economies. Relative to six months ago, when the prospect of another adverse Covid shock was my main concern, the risk of generating a more traditional recession through the interaction of central bank policy, financial markets, and growth has risen. I'm not sure whether that risk is now bigger than the risk of another Covid-induced downturn, but it's certainly a real risk.

Q&A on US recession risk

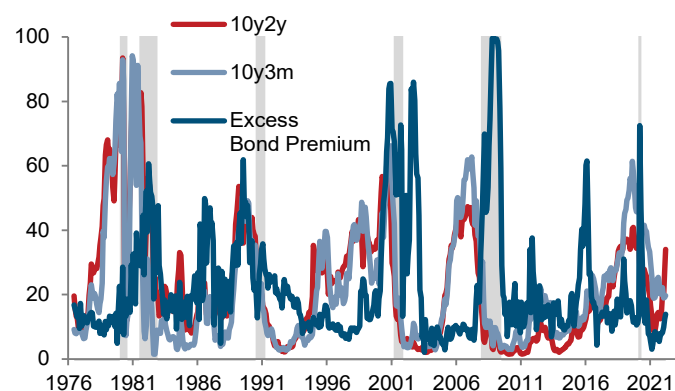
David Mericle answers key questions about the risk of a US recession over the next year

Q: Does the market expect a recession?

A: Traditional market indicators of recession risk are sending conflicting messages. Models based on the slope of the yield curve imply recession odds of 20-35% over the next year, above the 15% unconditional historical odds of a recession in any four-quarter period. We have reservations about these models, but those yield curve-implied odds of recession seem reasonable to us. In contrast, credit market signals like the [excess bond premium](#) imply much lower recessions odds of just over 10% this year.

The yield curve implies ~20-35% odds of a US recession over the next year

Market-implied odds of a recession in the next 12 months, %



Source: Bloomberg, Goldman Sachs GIR.

Q: How worried are you about a US recession this year?

A: We started the year with a well below-consensus US GDP growth forecast because we expected reduced fiscal support to pose a major headwind to growth. Following the recent rise in oil prices on the war in Ukraine, we recently cut our 2022 Q4/Q4 forecast to 1.75% (vs 2.4% at the beginning of the year) which we estimate is the economy's longer-run potential growth rate.

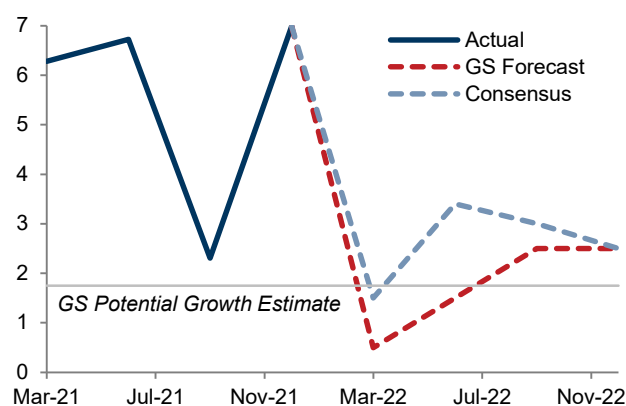
The risk of a US recession this year has always looked higher than in an average year to us because there is more uncertainty about the key drivers of the growth outlook, which increases tail risks in both directions. We see economic growth this year as a battle between fiscal drag and what will hopefully be large boosts from further service sector reopening and spending of excess savings. The uncertainty is high both because the magnitude of these forces is huge—we estimate that reduced fiscal support will be a 4pp drag on growth, whereas risks in the last cycle like the US-China trade war were measured in tenths of a percentage point—and because there is little recent precedent on which to base estimates of factors like the excess savings effect. Two other risks also raise the odds of recession this year relative to a normal year: the possibility of a harmful new virus variant emerging, and the war in Ukraine.

Q: Could the war in Ukraine cause a US recession?

A: The direct effects of the war are probably not enough to push the US economy into recession. Our [rules of thumb](#) are

that every \$10/bbl increase in oil prices reduces US GDP growth by 0.1pp, and every 1pp decline in European growth reduces US growth by 0.05pp via the export channel. Higher food and other commodity prices could weigh on growth further, but these effects are unlikely to push US growth below 1-1.5%, even if trade with Russia is more fully disrupted. For the war to spark a recession in the US, it would also need to cause a large tightening in US financial conditions and a deterioration in consumer and business sentiment. While that is not our base case, it's not impossible, especially if Europe—which is much more exposed to Russian energy exports—were to fall into recession first.

Lower growth due to higher oil prices and the war in Ukraine
Real GDP growth, % change, annual rate



Source: Bureau of Economic Analysis, Bloomberg, Goldman Sachs GIR.

Q: Will the Fed cause a US recession?

A: We worry more about the growth effects from fiscal than monetary policy tightening, both because the size of the fiscal drag on growth is larger, and because the Fed would likely recalibrate policy tightening if the economy threatened to fall into recession. Fed officials have certainly not concluded that a recession is necessary to bring down inflation.

That said, the risk of accidentally overtightening is probably higher than in the last cycle, when the Fed was very quick to back off when downside risks emerged or financial conditions tightened significantly. Today, the Fed has a much more urgent need to fight inflation than it did in the last cycle, and the bar for it to stop hiking will be higher. During the last cycle we [argued](#) that a tight labor market posed less recession risk than it had historically because the anchoring of inflation expectations and the flattening of the Phillips curve meant that the Fed didn't have to tighten as aggressively to prevent inflationary overheating. Today, with some signs of at least a moderate wage-price spiral emerging, that's much less clear.

Q: How bad might a potential US recession be?

A: Any of the above scenarios would probably imply only a mild recession because the US economy does not have major imbalances that need to unwind. Moreover, with labor demand starting at an extremely high level, we would probably see much less of an increase in unemployment than in most recessions.

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Fed hiking cycles: hard & soft landings

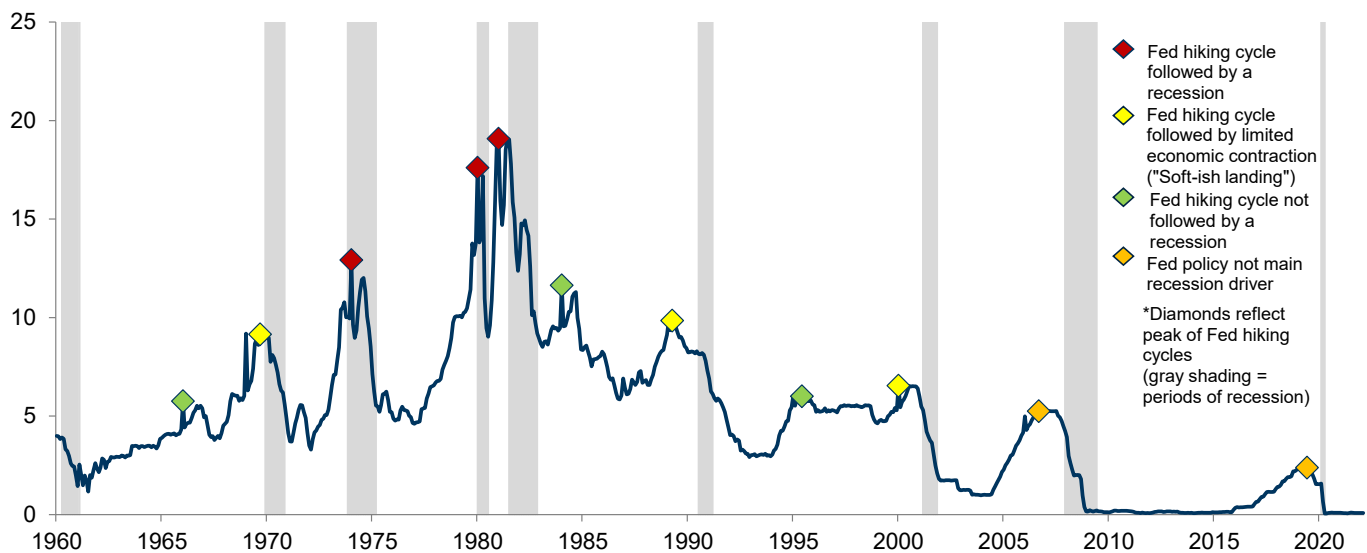
The Fed has a somewhat mixed track record of delivering perfect soft landings (i.e., no quarters of economic contraction)

Tightening period	Change in RFF (bps)	NBER first recession month	Real GDP drop	Policy-induced recession?
Sep. 1965 - Nov. 1966	175	--	None	No
July 1967 - Aug. 1969	540	Jan-70	-0.6%	Soft-ish landing
Feb. 1972 - July 1974	960	Dec-73	-2.7%	Hard landing
Jan. 1977 - Apr. 1980	1300	Feb-80	-2.2%	Hard landing
July 1980 - Jan. 1981	1000	Aug-81	-2.1%	Hard landing
Feb. 1983 - Aug. 1984	315	--	None	No
Mar. 1988 - Apr. 1989	325	Aug-90	-1.4%	Soft-ish landing
Dec. 1993 - Apr. 1995	310	--	None	No
Jan. 1999 - July 2000	190	Apr-01	-0.1%	Soft-ish landing
June 2004 - June 2006	425	Jan-08	-3.8%	Policy not main recession driver
Oct. 2015 - Jan. 2019	225	Mar-20	-10.1%	Policy not main recession driver
Mar. 2022 - ?	?	--	--	?

Source: "Landings Hard and Soft: The Fed, 1965-2020" Alan Blinder (2022), Goldman Sachs GIR.

The coming tightening cycle will begin with interest rates at historically low levels...

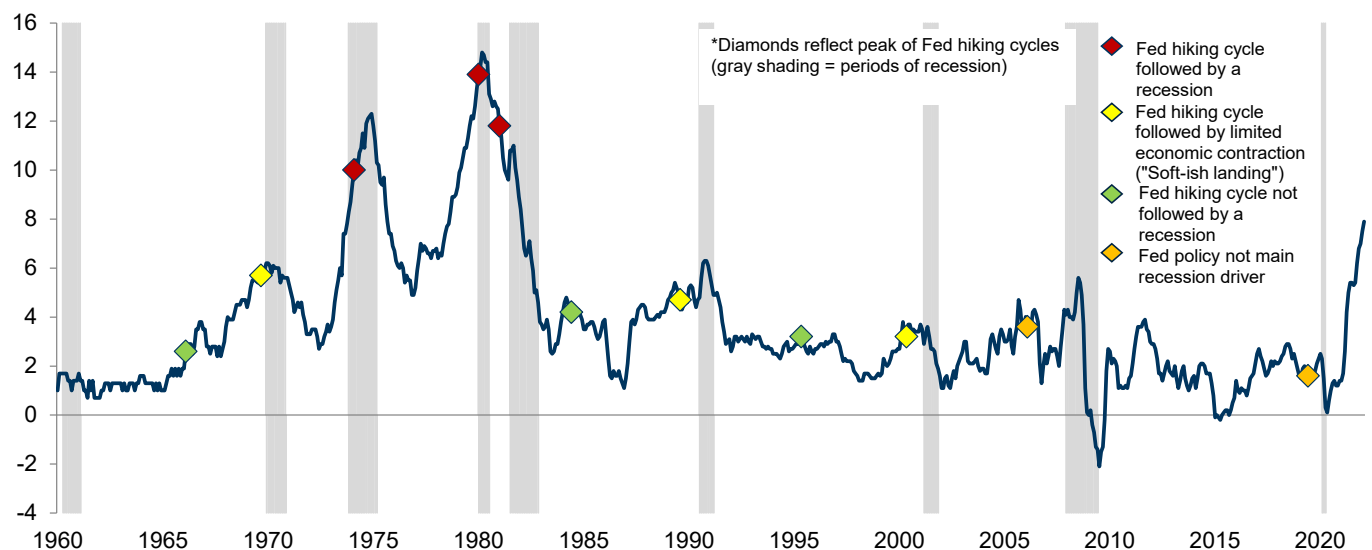
Fed funds effective rate, % pa



Source: "Landings Hard and Soft: The Fed, 1965-2020" Alan Blinder (2022), Goldman Sachs GIR.

...and with inflation more elevated than any time since the 1970s

Headline CPI inflation, % yoy



Source: "Landings Hard and Soft: The Fed, 1965-2020" Alan Blinder (2022), Goldman Sachs GIR.

Central bank policy snapshot

	Interest Rate Policy	Balance Sheet Policy	Outlook
Fed	<p>Federal funds rate: 0.00-0.25% Last changed March 2020 (-100bp), the second rate cut since the beginning of the Covid pandemic and the 5th rate cut since the Fed raised rates in December 2018</p>	<ul style="list-style-type: none"> Started reducing the monthly pace of its net asset purchases in Nov 2021, and ended net additional purchases of Treasuries and agency MBS in early March. The Fed balance sheet currently stands at around 37% of US GDP. 	<ul style="list-style-type: none"> We forecast seven 25bp rate hikes in 2022, starting in March, and four quarterly hikes in 2023. We forecast a terminal funds rate of 2.75-3%. We expect the Fed to announce the start of balance sheet reduction in June, and finish it in 2025. We expect runoff caps of \$60bn per month for Treasury securities and \$40bn per month for mortgage-backed securities, which we project would shrink the balance sheet to its eventual equilibrium size over three years.
ECB	<p>Deposit facility rate: -0.50% Last changed: September 2019 (-10bp), the 8th cut since the ECB temporarily raised interest rates in 2011</p> <p>Main refinancing operations rate: 0% Marginal lending facility rate: 0.25% Last changed: March 2016 (-5bp), the 8th cut since the ECB temporarily raised interest rates in 2011</p>	<ul style="list-style-type: none"> <u>Recalibrated</u> the pace of purchases under its Asset Purchase Programme (APP) in Mar 2022 by deciding on a monthly net purchase pace of €40bn for April, €30bn for May, and €20bn for June. Expects APP net purchases to end in Q3 if the current economic baseline forecast is confirmed. Has <u>announced</u> it will discontinue net purchases under the Pandemic Emergency Purchase Programme (PEPP) at the end of March. The ECB balance sheet currently stands at around 65% of Euro area GDP. 	<ul style="list-style-type: none"> We expect the ECB to continue net APP purchases at €20bn/month through Sept 2022. We forecast the first 25bp Deposit Rate hike in Dec, and a second 25bp hike in Mar 2023 and further 25bp hikes every six months thereafter up to a terminal rate of 1.25%. The ECB has stated that reinvestments of the principal payments from maturing securities purchased under the APP will continue for an extended period of time past the date on which the ECB begins to raise rates.
BOE	<p>Bank Rate: 0.5% Last changed: February 2022 (+25bp), the second rate increase since the BoE cut rates at the beginning of the Covid pandemic</p>	<ul style="list-style-type: none"> BoE members <u>voted</u> in Feb 2022 to begin to reduce the stock of UK government bond purchases by ceasing to reinvest maturing assets, as well as to begin to reduce the stock of sterling nonfinancial IG corporate bond purchases by ceasing to reinvest maturing assets and by a program of corp bond sales. The BOE balance sheet currently stands at around 30% of UK GDP. 	<ul style="list-style-type: none"> We think the BoE will hike rates by 25bp increments in Mar, June, Aug, Sept, and Nov, with Bank Rate reaching 1.75% at year-end. While we expect Bank Rate to hit the 1.0% threshold for asset sales in June, we do not expect active asset sales to begin until August. Once asset sales begin, we look for around £20bn per quarter of asset sales, in addition to the natural run-off of the balance sheet.
BOJ	<p>Policy deposit rate: -0.10% Last changed: January 2016, when the Bank introduced its negative interest rate policy (NIRP)</p> <p>10y JGB yield target: ~0%, with tolerance band of -/+25bp (yield curve control policy, YCC)</p>	<ul style="list-style-type: none"> The Bank <u>voted</u> in Jan 2021 to purchase ETFs and J-REITs as necessary with upper limits of ~¥12tn and ~¥180bn, respectively, on annual paces of increase in their outstanding amounts, as well as to purchase CP and corporate bonds with an upper limit on the outstanding amount of ~¥20tn in total until end-March. The BOJ balance sheet currently stands at around 135% of Japan GDP. 	<ul style="list-style-type: none"> We expect the BOJ to maintain YCC and the NIRP throughout 2022. We expect the BOJ to continue tapering JGB purchases gradually in 2022. We expect future purchases of ETFs and J-REITs to be limited to times of significant market stress, and expect the BOJ to continue tapering those purchases throughout 2022.

Source: Federal Reserve, European Central Bank, Bank of England, Bank of Japan, Goldman Sachs GIR.

Interview with Philipp Hildebrand

Philipp Hildebrand is Vice Chairman of BlackRock and former Chairman of the Governing Board of the Swiss National Bank. Below, he argues that the Russia-Ukraine conflict raises stagflationary risks, especially in the Euro area, and that central banks will have to learn to live with higher inflation given that the growth costs of stamping out supply-driven price shocks would be too high at a time when growth is already weakening substantially.

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



Allison Nathan: How concerned are you about the prospect of stagflation in the Euro area and beyond at this point?

Philipp Hildebrand: Stagflation risk is a real concern today. Up until a couple of weeks ago, I wasn't particularly worried because the inflation we were seeing was not the result of classic

economic overheating, but rather of a pandemic-induced supply shock that I was confident would ease as economies continued to open up. So I didn't see comparisons to the 1970s, when central bankers were forced to slam on the brakes in order to cool overheating economies, as useful. But now, on top of the supply shock related to the economic reopening, we have another huge supply shock from the Russia-Ukraine conflict. So, we are looking at a supply shock layered on top of a supply shock. And the nature of the new supply shock—centered on energy—suggests not only that inflation will move even higher and likely prove more persistent moving forward, but also that growth will take a hit. This is especially concerning in the Euro area given that it's both more exposed to a disruption in energy flows from Russia and is already starting with a relatively lower growth cushion than the US is.

To put some numbers behind this, prior to the conflict, consensus expectations for annual growth in the year to 4Q22 for the Euro area were just above 3%, and we estimate that the commodity supply shock we've already seen will shave that by about 2.5pp considering weaker real incomes, and lower consumer and business confidence, as well as disruptions to the supply of essential inputs. So even without a deterioration in the geopolitical situation, we expect to be uncomfortably close to a zone where stagflation is a real risk in the Euro area. And, if energy supply disruptions increase further, the hit to Euro area growth could be even bigger, which, just arithmetically, could easily tip the Euro area into a stagflation scenario of very low or even negative growth and high inflation.

Allison Nathan: What will these stagflation risks mean for monetary policy in the Euro area and the US?

Philipp Hildebrand: Unlike in past crises over the last several decades when the go-to reaction of central banks was to ease policy, central banks today have little choice but to continue to press ahead with policy normalization, as we saw with the ECB's recent decision to continue to roll back its asset purchases despite the growth shock from Russia's invasion of Ukraine, and the Fed will surely follow suit by beginning to hike rates this week. While central banks won't tighten aggressively, they have to continue to normalize because the extreme level of monetary policy stimulus that the pandemic shock required is

no longer justified, and, most importantly, the biggest risk right now is that long-term inflation expectations become unanchored. Central bankers are no doubt in a difficult position, but continuing to normalize is the right strategy because, as one of my colleagues recently said, the dirty little secret of central banking is that we don't really understand how inflation expectations work. And from my practical experience, that's exactly right. We understand that anchored inflation expectations are crucial to price stability, but we know much less about how expectations become embedded and how they can come undone. So the most dangerous issue today is that we don't know how to observe or anticipate the moment when inflation expectations become unanchored. And, given that the risk of a wage-price spiral has substantially increased off the back of the two major supply shocks we're now experiencing, central banks must take sufficient action to exude credibility and ensure that long-term inflation expectations don't become unanchored, which requires tightening policy despite increasing growth risks.

Allison Nathan: Is there a distinction, though, between the considerations of the ECB and of the Fed at this point given that inflation trends are arguably more concerning in the US than in Europe, and conflict-related growth concerns are more acute in Europe?

Philipp Hildebrand: The Fed is in a less uncomfortable position vis-à-vis growth concerns for three reasons. First, the energy cost burden as a percentage of GDP is much lower in the US than in the Euro area, where this burden is set to rise to its highest level since 1980. Second, roughly 40% of the Euro area's natural gas supplies come from Russia, which creates additional vulnerability to outright disruptions in energy flows and surging energy prices. And, third, as mentioned, the growth cushion is lower in the Euro area than in the US right now. For these reasons, I expect policy normalization in the Euro area will be more biased towards rolling back asset purchases and less focused on interest rate hikes that could weigh more heavily on growth; if I were at the ECB right now, I would probably not hike imminently and would instead wait to see how the crisis evolves. But in the US, we are likely to see both rate hikes and balance sheet shrinkage in the short term to address the significant inflation concerns.

Allison Nathan: That said, is the ECB prepared to tolerate substantial spread widening in the European periphery as a result of the ongoing crisis?

Philipp Hildebrand: Given that the ECB really can't meaningfully respond given the inflation concerns we've discussed—not to mention that any room to respond is naturally limited by the already very easy starting point of monetary policy—the name of the game on the policy side to

contain such pressures will be fiscal policy. And we're already beginning to see fiscal measures being employed, such as the recent announcements of energy subsidization at the EU level. This policy makes sense because it addresses some of the inflation risks; while we don't know much about how inflation expectations are formed, if people are forced to pay higher prices at the gas pump every week, that can't be good for long-term expectations of price stability. So, subsidizing energy prices seems like an effective policy response because it cushions both the hit to growth and the risk of rising long-term inflation expectations. The joint issuance of bonds in the Euro area is also now a serious possibility to contain this fragmentation risk, and could be used aggressively if need be, as that Rubicon was crossed during the Covid crisis. The world in which Germany objected to such instruments is now gone, which should alleviate some concern about spreads blowing out. Some periodic episodes of spread widening are still possible, as we have seen in recent weeks, but I don't think that will be a central part of the story this time around.

Allison Nathan: Given the challenges that stagflation risks pose to policymakers, where do you expect interest rates to ultimately end up in this cycle?

Philipp Hildebrand: The end point of the cycle will inevitably be muted compared to a normal cycle because we're starting from a point of high, and likely persistent, inflation at the same time that growth is already experiencing a shock. That essentially means that both the ECB and the Fed will have to tolerate, and learn to live with, higher inflation. At this point, I expect the US terminal rate to be somewhere in the 2-2.5% range, which is about half of the endpoint of cycles historically.

Allison Nathan: But if you are more concerned about the risk of inflation expectations becoming de-anchored off the back of the additional supply shock, wouldn't you expect terminal rates to be as high or even higher than in past cycles? Why would you expect that this normalization cycle will be shallower than past cycles?

Philipp Hildebrand: I expect a more muted rate hiking cycle because inflation largely remains a supply side story; raising rates won't ease the energy and other supply constraints that are driving it. So pushing inflation down significantly would require extremely aggressive tightening that would absolutely kill the economy. Particularly in an environment in which growth is already weakening, I don't believe that's a trade-off that any central bank would make. That was more debatable before the Russia-Ukraine conflict broke out, but it now seems completely clear to me that, especially in the Euro area where growth is already getting hit, central banks simply won't go the conventional route of breaking inflation's back by just raising and raising rates so that terminal rates end up the same as, let alone higher, than they have historically at the end of the cycle. That just strikes me as an impossibility, because you'd have to crush demand to get to that point when growth is already weakening. Realistically, that's just not going to happen, which is why I believe this hiking cycle will be more muted.

Allison Nathan: But isn't the ECB signaling that it's ready to step in and focus on fighting inflation in the statement from its recent meeting?

Philipp Hildebrand: The ECB is trying to find ways to reassure the market that they're continuing to normalize to minimize the risk of inflation expectations becoming unanchored. That doesn't change my view that this will be a muted cycle and that central banks will have no choice but to live with higher inflation for some time.

Allison Nathan: So how should investors position for the environment that you expect?

Philipp Hildebrand: A world of higher and more persistent inflation is worrying for bond exposure. Last year saw positive equity returns and negative bond returns, which has only happened in three of the last 50 years. Although recent developments also leave the outlook for equity returns in doubt, there's a good chance that we could see a second year of positive equity returns and negative bond returns, which would be the first time that we've seen this pattern for two years in a row in the last half century. So what we are witnessing is a regime change that we haven't experienced in modern times, which makes it very difficult to be constructive on bonds. For this reason, we are recommending a clear underweight in bonds, and, if investors need fixed income exposure, to seek it through inflation-linked bonds if possible. This environment also suggests increasing allocations to private markets. We also remain relatively constructive on public equities, but geopolitical risks could derail their returns depending on how the situation evolves.

Allison Nathan: The stagflationary environment of the 1970s was an exceptionally notable period in economic history. Will this moment likely prove to be as well?

Philipp Hildebrand: The longer-term consequences of Russia's invasion of Ukraine that has given rise to these risks are quite extraordinary. The number of long-held dogmas that have been thrown overboard in a matter of weeks is astounding, such as Germany's decision to rearm itself, which was taken by a Left/Green coalition, no less. We can't overestimate how much the world—and especially Europe—has changed in a very short amount of time. Some of the changes are positive. The European Monetary Union is now a much more compelling construct because of the ability to issue joint bonds and have a broader European response to crises in that sense, which will be useful in future crises. But the jury is still out on other developments, such as what it really means to weaponize finance and economics so aggressively. In the span of two weeks, the world has essentially engineered a major financial crisis in a very large country. Right now, there's unity behind this effort, partly because it's the only instrument the West has to counter Russia's invasion. But I wonder what the inevitable rewiring of the global economy towards a more fragmented system as a result of all of this will mean over the longer term.

In any case, we just marked the hundred-year anniversary of the Versailles Peace Conference that ended WWI, and, from what I understand, the European summit to discuss how to respond to these tumultuous developments was held in the same room in Versailles. This is a reminder that while we must deal with the current crisis, history teaches that extreme action today also shapes the world decades from now. And so, we can all hope that wise people were in the room this time around to avoid making the same mistakes of a century ago again.

Europe: a war-induced recession?

Jari Stehn argues that Euro area growth risks have grown sharply due to the war in Ukraine, but still sees ECB policy normalization ahead

The economic fall-out from the war in Ukraine has grown as the conflict has escalated, and we see four main channels through which the war will weigh on Euro area growth. First, financial conditions have tightened significantly further in recent days, with our Euro area FCI now about 30-40bp tighter than before Russia's invasion of Ukraine. Second, trade spillovers have become more relevant as the Russian economy is contracting sharply and many Western companies have withdrawn from the Russian market. Third, the ongoing surge in energy prices is likely to weigh significantly more on households' real disposable incomes, and therefore consumption, than initially anticipated. And fourth, we anticipate substantial production cuts due to further energy supply disruptions from Russia given the Euro area's dependence on Russian oil and gas. Taken together, we estimate that these spillover channels point to a drag on 2022 Euro area annual growth of almost 2pp.

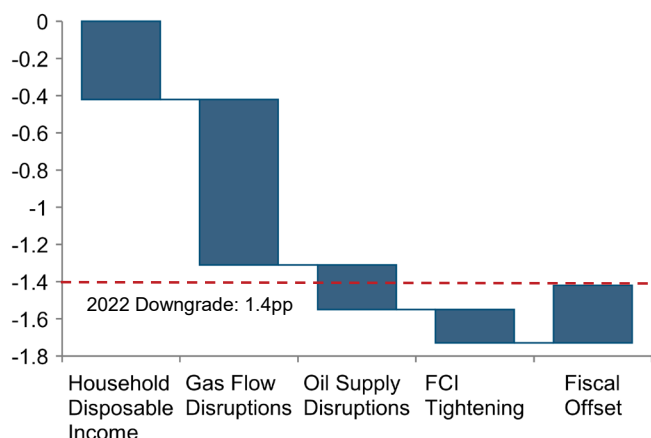
At the same time, we expect additional fiscal support to cushion the negative growth effects of the crisis. In particular, we expect measures that target the surge in energy prices, increase defense spending, and increase public spending, motivated by the need to support refugees from Ukraine. On net, we estimate that these measures will increase public deficits by roughly 1% and provide a growth-hit offset of about 0.5pp in 2022 across the EMU-4.

Weaker growth, downside risk

All told, we see a net hit to 2022 Euro area growth of 1.4pp from the war in Ukraine, and have downgraded our growth forecast accordingly to 2.5% (from 3.9% before). With this downgrade, we expect Euro area growth to turn negative in Q2—driven by lower growth in Italy and Spain—which puts the Euro area on the edge of recession. Looking across countries, we expect the growth hit to be larger in Germany (which is most reliant on Russian gas supply) and Italy (which uses a lot of gas in its production) than in France (which is least reliant on Russian gas).

A significant Euro area growth hit from the war in Ukraine

2022 Euro area growth downgrade, pp

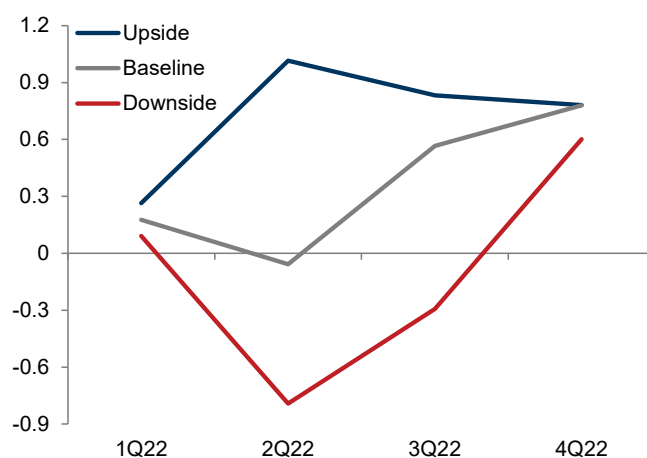


Source: Goldman Sachs GIR.

While the risks to our forecasts are two-sided, we think the risks are tilted to the downside due to the potential for further escalation of the conflict and/or significant disruptions to commodity flows. In our downside scenario, we assume that a ban on Russian energy exports would lead to sharply higher energy prices and a sizable 2.2pp hit to production. In such a scenario, we would expect a recession (with negative growth in both Q2 and Q3), with 2022 annual growth still positive at 1.4% due in large part to base effects. Germany and Italy would similarly be most affected in this scenario due to the disruption in gas flows. An upside scenario with only limited disruptions to gas flows would likely leave 2022 Euro area growth ~3.6%.

Weaker growth, with risks tilted to the downside

2022 Euro area real GDP growth forecast, % QoQ



Source: Goldman Sachs GIR.

Policy normalization still ahead, but delayed

The war in Ukraine has increased the risks around the ECB outlook, with weaker growth and higher inflation implying a more difficult trade-off for policymakers. At its March meeting, the ECB placed more weight on high inflation than the growth risks from the war, and signaled that it expects to accelerate its exit timeline this year. Net APP purchases will now average €30bn in Q2 (versus €40bn previously) and are expected to end in Q3, with a first rate hike expected "some time after."

Given our substantial downgrade to 2022 Euro area growth, we anticipate further downward revisions to the ECB's growth outlook, and therefore expect that the exit timeline will be delayed by one quarter. We now expect QE to run until September with liftoff expected in December. From there, we expect a second rate hike in March 2023—which will increase the Deposit Rate to 0%—followed by hikes every six months until a terminal rate of 1.25% is reached.

However, the uncertainty around the economic outlook implies substantial uncertainty around the ECB's exit timetable. In our upside scenario, we would expect APP to end in early Q3, followed by rate hikes in September and December. But in our downside scenario—which entails a significantly larger growth hit—we would look for a substantial delay to ECB exit, with QE running until 1Q23 and the first rate hike only in 3Q23.

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Goldman Sachs International

Interview with Praveen Korapaty

Praveen Korapaty is Chief Interest Rates Strategist at Goldman Sachs. Below, he discusses the outlook for US yields and curve shape, and why he thinks long-end yields look mispriced.



Allison Nathan: Markets have had to recently digest consistently strong inflation prints and the Russia-Ukraine conflict. Where do you expect yields to go from here?

Praveen Korapaty: Our year-end 2022 forecasts for 2y and 10y UST yields are 1.9% and 2.25%, respectively, which suggests some further selloff and curve flattening. Although the Russia-Ukraine conflict has led to substantial volatility in bond yields and an unwind of some hike pricing—consistent with the historical experience of geopolitical risk slowing policy normalization—our economists think that the conflict's direct US growth impacts will likely be limited, and that it will impact inflation more than growth. In the current environment of already-high US inflation, this suggests a stronger case for the Fed to press ahead with rate hikes than in past instances of high geopolitical uncertainty. So, current volatility aside, we continue to expect directionally higher bond yields from here, and believe market expectations for a terminal rate of 1.75-2% look too low.

Allison Nathan: Does your expectation for further curve flattening give you pause that the curve is moving towards inversion, historically a red flag for recession?

Praveen Korapaty: Not particularly. Although curve inversion has historically been a recession signal, the odds that the 175-200bp of rate hikes that the market is currently pricing in for this cycle tip the economy into recession, while having risen following the Russia-Ukraine conflict, are still low. The post-Covid economic recovery is far more robust than the recovery from the Global Financial Crisis. So it seems odd to assume that the Fed won't be able to at least tighten to the rate levels of the last cycle, especially since in real terms this pricing is actually less restrictive than in the last cycle given that we expect inflation will be higher on average this time around. The current inversion of the curve in 2024 is also unusual relative to history in that it has occurred before the Fed has even started to raise rates, and may just largely reflect an extremely inverted inflation curve, which we haven't seen to this degree since the 1970s. Additionally, markets have tended to underestimate the terminal rate before the start of a cycle. Given all of these factors, I'm somewhat skeptical about the value of the signal from an inverted curve, at least as of now.

Allison Nathan: Why are market expectations of the terminal rate as low as they are today, which has led the market to price curve inversion much earlier in the cycle?

Praveen Korapaty: There are two possible explanations. One, it could be that a critical mass of investors believes the normalization cycle will be shallow. This camp of investors may believe that the natural state of the world is one of low inflation, and so the Fed either doesn't have to hike rates as much to bring inflation back under control, or the ongoing economic recovery isn't as robust as it seems and therefore

only a small amount of tightening will be needed to return to the low inflation world of the last decade. Some investors in this camp may also ascribe higher odds to a recession or sharp economic slowdown, which would necessitate rate cuts.

A second explanation, and the one we favor, is what [we refer to](#) as a "new bond market conundrum"—long-end yields are sticky, even as front-end yields are rising, because of a global duration supply/demand imbalance that's distorting the price signal at longer maturities, resulting in depressed real risk premia. Despite record sovereign debt issuance, there is a global shortage of risk-free long duration assets, as most G10 central banks have been buying such assets very aggressively. Commercial banks too have been large buyers; regulation and the forced expansion of their balance sheets—a consequence of quantitative easing programs—have effectively made them captive buyers of sovereign debt. So the amount of these risk-free assets available to other investor classes, relative to the growth in broader financial assets, has fallen. Without such an imbalance, long-term yields would likely be higher than they are today.

Irrespective of which explanation is behind the back-end being mispriced—and we think there is probably an element of both—the stickiness in long-end yields will likely persist for a while, which means the curve could invert early in the cycle.

Allison Nathan: What would the curve look like in the event that the Fed has to hike more aggressively than markets are anticipating to rein in inflation, and how can investors hedge this "policy mistake" scenario?

Praveen Korapaty: The curve would likely invert more significantly if the Fed has to hike more aggressively than anticipated, assuming that the marginal investor continues to cling to the low terminal rate view. However, it's possible that markets come around to our view of a higher terminal rate for this cycle, and so the curve could instead move up in a near parallel fashion with the current mild inversion. But it's not clear yet which of these two outcomes will occur, so it's not necessarily a great idea for investors to take a strong view on longer-term rates. Rather, investors should be more focused on the front-end, because even though we think long-end mispricing will likely dissipate eventually, what will force it to move is the front-end cash rate moving higher, irrespective of which of the two explanations is behind long-end stickiness.

That's because if investors believe that the normalization cycle is shallow and the terminal rate is therefore low, they would likely change this belief only if presented with evidence to the contrary—for instance, if the policy rate is increased to levels closer to current terminal rate pricing and the economy holds up, similar to what happened in the 2004-2006 hiking cycle. Market pricing suggested that many investors at the time assumed a neutral rate of around 4%. But when the Fed hiked the policy rate to 4%, and found that economic growth was still strong and inflation was still somewhat elevated, it continued

with its policy normalization. In fact, the Fed raised rates a further 125bp before the end of that cycle.

If instead long-end rates are sticky because of a supply/demand imbalance, that too could be resolved by higher cash rates, because Fed hikes would dampen the demand for longer maturity debt from active investors who are no longer being adequately compensated for taking on duration risk in a flat yield curve and rising rate environment, and from foreign investors as the cost of the FX hedge rises. The supply picture is also changing as central banks unwind their balance sheets, but this change is small relative to the potential loss of demand. Bottom line, the conundrum of low longer-term rates is likely mainly going to be resolved with higher cash rates.

Allison Nathan: What effect will balance sheet shrinkage have on curve shape? If the Fed relied more on quantitative tightening rather than the funds rate, and perhaps even pursued active asset sales, what effect would that have?

Praveen Korapaty: The classic central bank policy tightening cycle mostly relies on rate hikes, which tend to flatten the yield curve given that the front-end is almost arithmetically tied to the policy rate setting, and, as it moves higher, it should catch up with the longer-end that presumably reflects some sense of what the neutral rate is. While some Fed officials have been concerned that the curve is currently flattening at very low levels and sending a recessionary signal, balance sheet shrinkage is not a particularly fruitful way to offset the flattening and steepen the curve. Under our baseline assumption of a \$2.1-2.6tn reduction in the size of the Fed's balance sheet, the equilibrium level of 10y yields should be around 20-30bp higher. However, given that we expect this unwind to take place over 2-3 years, it's unlikely that markets will fully price that in upfront, so the resetting of equilibrium levels will likely only be gradual. It's also important to keep in mind that quantitative tightening is not the opposite of quantitative easing, at least not the way the Fed is implementing it. If Treasury leaned heavily on bills rather than on coupon securities to replace lost Fed financing, investors wouldn't have to absorb a significant amount of new duration risk, and the price impact of balance sheet shrinkage on bonds would therefore be minimal.

Active Treasury sales could have a bigger impact on the level of yields, and can in theory lead to a steeper yield curve because sales would introduce an element of uncertainty and force investors to price in more risk premium. However, it's unlikely that the Fed would engage in active asset sales, both because a substantial amount of Treasuries is already maturing organically, and because sales could elicit a non-linear response, and lead to disorderly repricing. That can cause issues with Treasury market functioning, which the Fed pays close attention to and is unlikely to risk.

Allison Nathan: How concerning, then, is the recent worsening of market liquidity and rise in dollar funding costs? Are you worried about market functioning?

Praveen Korapaty: Current stresses in the US rates market have occurred in two phases. Deterioration in market liquidity began when the Fed started to taper its asset purchases in November, as the Fed's reduced role as a "backstop" buyer in the secondary market has made market makers less willing to

aggressively make markets in off-the-run securities, and yield dispersion metrics have been widening as a result. Funding spreads, on the other hand, widened more recently as sanctions on the Central Bank of Russia and the exclusion of some Russian banks from SWIFT have modestly disrupted dollar funding markets and led to some precautionary demand. While these dislocations could persist in the near term, particularly in terms of commodities and trade finance, we see limited risk of a more extreme dislocation, as the overall liquidity backdrop is far more supportive today compared to when funding market stresses spiked during the Covid shock. Existing central bank swap lines could be tapped and enhanced, and there are other sources of liquidity, like the Fed's FIMA and repo facilities. So, while the current widening could reflect pressures in certain sectors, I don't see it as indicative of systemic risk. That said, we should be prepared for a more fragile Treasury market in the presence of flow imbalances.

Allison Nathan: What effect will other G10 central banks hiking rates have on US yields and the shape of the curve?

Praveen Korapaty: Unlike the last cycle when the Fed was the sole hiker among the large central banks, policy normalization in this cycle is likely to be more synchronized—with the exception of the BOJ, we think most G10 central banks will have started policy normalization by next year. The ECB's potential exit from negative rates and QE, which the conflict may delay, nonetheless deserves a special mention, because negative nominal yields on a significant share of high-quality European debt have led to large inflows into the US and other regions with higher-yielding debt, which has distorted equilibrium yields and suppressed risk premia in those regions. As yields in Europe turn positive in this cycle, the amount of investable European assets will increase, allowing US yields to move higher. However, while bond risk premia could increase, we don't think it will be sufficient to steepen the yield curve, because policy rate normalization—which we expect will flatten the curve—will be the dominant driver of curve behavior.

Allison Nathan: As yields rise across G10 economies, when do you expect real yields to move into positive territory?

Praveen Korapaty: In the US, I expect 10y real yields to turn positive somewhere between the early and middle part of 2023, and I similarly would expect real yields across many G10 to turn positive sometime in 2023 or 2024, though the exact timing will depend on the trajectory of inflation and how central banks respond. Positive real yields will make bonds more attractive in portfolios, both in terms of their absolute returns and their value as a portfolio hedge, suggesting that higher allocations to bonds in the future could make sense.

Allison Nathan: Looking ahead, how do you think about the balance of risk to your forecast of higher yields?

Praveen Korapaty: The biggest risk to our forecasts is higher inflation and, in turn, potentially a more aggressive central bank response. If it turns out that the world is moving into a higher inflation regime, yields across the curve could rise further, with longer-term 10y UST yields possibly reaching 3.5-4%. Of course, there's a chance yields could fall short of our targets as well, but the risks to the upside are likely greater.

Between a rock and a hard place

Dominic Wilson and Vickie Chang discuss the asset implications of policy-induced versus Ukraine-related growth risks

As we entered 2022, a key dynamic for asset markets was the delicate dance between growth and monetary policy. The first six weeks of the year saw fears of a more aggressive Fed tightening contribute to a sharp rise in bond yields. As inflationary pressures intensified, [we highlighted](#) the risk that the Fed might work harder to tighten financial conditions and slow growth more rapidly to trend. Put simply, the main concern was that the policy shock that the markets were digesting might morph into a growth shock, changing the pattern of asset market responses in the process.

That growth shock has now arrived, but from a very different source. Russia's invasion of Ukraine has dramatically increased market perceptions of growth risk, especially in Europe. Commodity supply disruptions and soaring commodity prices are so far proving to be the main source of transmission risk to the global economy, not central bank tightening.

But with this new shock adding to inflationary pressures at a time when inflation is already uncomfortably high in many economies, policymakers are likely to find themselves more constrained in responding to any growth damage. So, although we have moved from the risk of a "policy-induced" slowdown to the risk of a "policy-constrained" slowdown, the current mix of policy and growth is still a difficult one. And if the Ukraine crisis resolves more quickly, and with less damage to the global economy than we currently expect, any subsequent relief might soon see markets revisiting policy risks yet again.

The shift in risks from monetary policy to the conflict in Ukraine has changed some of the patterns in asset markets. The most obvious is that Ukraine-related risks weigh disproportionately on European assets and boost commodity-related areas. And because growth risk, rather than policy risk, is now more firmly in the driver's seat, equities have experienced more downside and yields less upside than we would have expected from a Fed-induced slowdown. But with policymakers constrained by inflation, what both scenarios are likely to have in common is less yield relief than typical during a normal growth slowdown.

Inflation raised risks of policy-induced slowdown

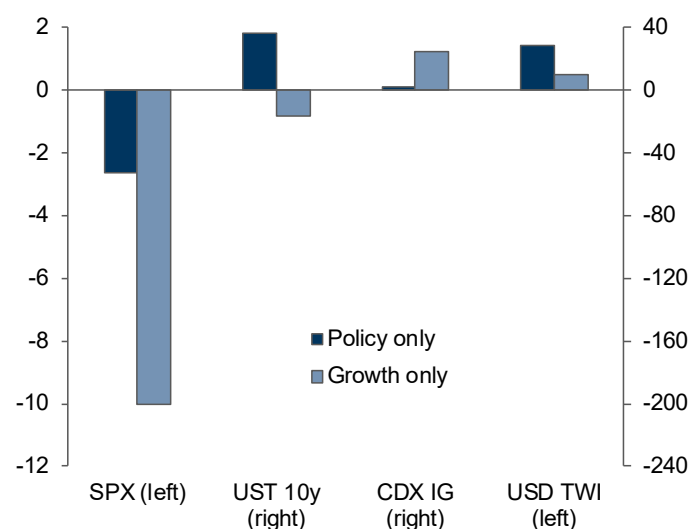
In January and early February, the focus of global markets was the hawkish shift in Fed, and subsequently ECB, policy. Financial conditions tightened sharply, but mostly in response to policy shifts rather than to shifting market growth views, which were much more modest and even positive in Europe. Cyclical equities outperformed earlier in the year, as did non-US equities. But as inflation risks have grown, so too has the risk that the Fed would act more decisively to slow the economy and that policy worries would morph into growth worries.

That kind of shift matters for markets because the market footprint of a policy shock and a growth shock are different. Although both shocks tighten financial conditions and weigh on risky assets, the relative mix matters for asset outcomes. Tighter monetary policy without a growth downgrade has a negative impact on equities and credit, but pushes yields decisively higher and is also generally associated with cyclical

equity outperformance and underperformance of long-duration equities like the Nasdaq. Downgrades to growth generally lead to more pronounced pressure on equities and credit, downward pressure on yields, and cyclical equity underperformance.

The cross-asset footprint depends on the source (and mix) of shocks

Asset changes implied by ~100bp Fed funds shock (policy) vs. a 100bp downgrade to 1y-ahead US GDP expectations; pp (lhs), bp (rhs)



Source: Goldman Sachs GIR.

The risk of a growth "scare" of this kind appeared to be rising in early February, as inflation outcomes continued to exceed forecasts. The prospect of the Fed acting more aggressively to slow growth to trend raised the possibility of a shift in the correlation structure of assets, including more pressure on cyclical equities and credit, which were relatively more resilient at the start of the year, and ultimately downward pressure on long-term yields.

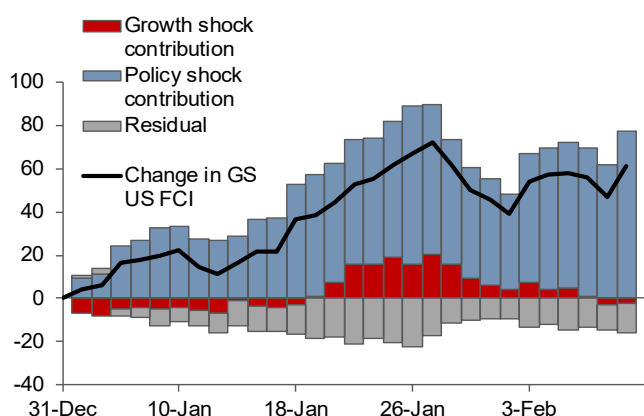
Russia-Ukraine conflict raises growth risks instead, but policy still constrained

What's happened instead, of course, is that growth risks have risen for an entirely different reason: Russia's invasion of Ukraine. The main economic transmission from this shock to the rest of the world is via sharply higher energy and commodity prices that are disproportionately damaging for the European economy due to its high dependence on Russian gas.

Markets have moved sharply to attempt to price the implications of these developments. Some of the patterns in asset prices match what we'd expect in the "policy-induced" slowdown scenario already laid out, including much sharper pressure on cyclical assets and on credit than earlier in the year. Comparing market performance in the lead-up and aftermath of Russia's invasion, we've seen a sharper underperformance of European assets and, for obvious reasons, a big rally in commodity prices, alongside outperformance of other commodity-related assets. Financial conditions have continued to tighten, but growth, not policy shifts, have been the dominant driver.

FCI tightening was policy driven to start the year...

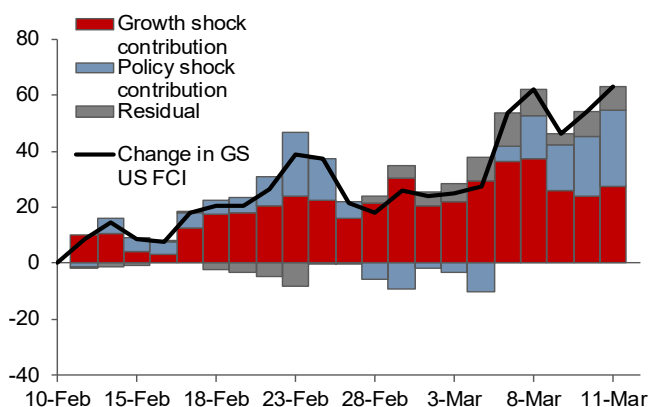
Contribution of growth and policy shocks to cumulative change in GS US FCI from December 31 to Feb 10, bp



Source: Goldman Sachs GIR.

...but has since turned growth driven

Contribution of growth and policy shocks to cumulative change in GS US FCI from Feb 10 to present



Source: Goldman Sachs GIR.

While the recent pattern of declining yields and declining equities looks different from a “policy-induced” slowdown, we think policy constraints are still playing a role. The ongoing commodity supply shock hurts growth, but also puts upward pressure on inflation at a time when central banks are already uncomfortable with the inflation outlook and worried about a potential de-anchoring of inflation expectations. For that reason, markets are expecting both the Fed and the ECB to be less willing to shift towards easier policy than might normally be the case in the face of additional headwinds to growth. As a result, yields have stayed roughly flat and risen at the front end, despite the size of the growth and equity market downgrades. So, although policy tightening is not the source of the growth risk, we still see monetary policy constraints playing an important role in the relative moves between equities and rate markets.

Markets pricing more growth risk, but not the worst case

We use our factor framework to map out a scenario that broadly aims to capture the assessment of economic risks that we envisage from the current crisis. Our central scenario involves an upward shift in oil prices broadly equivalent to our commodity strategists’ forecasts, and growth downgrades largely to the Euro area and to a smaller degree in the US and China, consistent with our economists’ estimates. In keeping with the notion that the Fed and ECB are likely to keep policy tighter than they otherwise would

in the face of slowing growth, we also include hawkish policy shocks in both cases, which dampen the impact of growth pressure on the monetary policy outlook and rates markets.

Market scenarios for current economic risks

	12/31-2/10 (1)	2/10-3/11 (2)	Fed-Induced Slowdown (3)	Central Scenario (4)	Downside Scenario (5)
S&P 500	-5.5%	-6.7%	-9.5%	-6.3%	-9.9%
Russell 2000	-8.6%	-3.5%	-13.6%	-8.9%	-14.4%
Nasdaq 100	-9.9%	-9.5%	-11.2%	-9.0%	-13.2%
Nikkei 225	-3.8%	-9.1%	-2.0%	-10.4%	-16.3%
HSCEI	6.7%	-19.7%	0.0%	-9.6%	-11.8%
Eurostoxx 50	-2.4%	-12.2%	-6.9%	-16.3%	-26.8%
MSCI EM	-2.6%	-12.2%	-5.9%	-7.1%	-9.4%
UST 2y	0.83	0.19	0.45	0.03	-0.04
UST 5y	0.68	0.02	0.24	-0.07	-0.15
UST 10y	0.53	-0.03	0.15	-0.14	-0.23
German 10y	0.43	0.04	0.09	-0.26	-0.38
CDX IG	16.1	9.5	18.8	10.8	19.8
iTraxx Main	16.7	16.3	19.0	17.2	31.2
Oil (WTI)	17.8%	20.0%	-8.3%	35.7%	50.0%
JPYUSD	-0.8%	-1.2%	-0.7%	2.4%	4.5%
CADUSD	-0.5%	-0.1%	-1.3%	-0.1%	0.5%
EURUSD	0.6%	-4.7%	-0.4%	-2.0%	-2.3%
USD TWI	-0.1%	1.7%	1.4%	1.1%	1.2%
GS US FCI	61 bps	63 bps	72 bps	37 bps	54 bps

Note: Column 3 reflects change from current market pricing we would expect if a Fed-induced slowdown were to re-emerge as a market concern; columns 3 and 4 reflect expected change in market pricing since before the Russia-Ukraine conflict (Feb. 10) under each scenario; yields are quoted in bp, credit spreads in bp. Source: Goldman Sachs, Goldman Sachs GIR.

At a high level, the central scenario shows that asset market shifts match the market movements across equity and rate markets in the last four weeks, although the recent bond selloff suggests that the market has been pricing the inflation risks and central bank constraints mentioned above. While these kinds of benchmarking exercises are inevitably imprecise, it also suggests that markets may already have shifted in many places to incorporate the broad magnitude of shifts we would expect from our assessment of the economic impact of the crisis so far.

The challenge is that there are still [significant downside tail risks to growth](#) in the current situation, especially in Europe, where a full shut-off of gas supplies would reduce growth substantially more than in our baseline case. In a severe downside scenario, and again assuming that the ECB is constrained to some degree in its response by the inflationary impact of the shock, increased growth risks would likely cause significant further pressure on risk assets from here, particularly in Europe. And even with policy more constrained than normal, we would expect to see larger falls in global bond yields, except perhaps at the very front end of rate curves. Because of the magnitude of the downside in this recessionary scenario, investors may struggle to exploit the emerging value in risky assets until they either have more confidence that left tail risks are receding or that asset markets are discounting those risks more aggressively.

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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.

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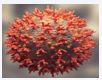
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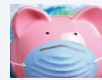
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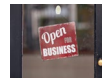
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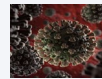
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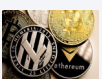
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Reg AC

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