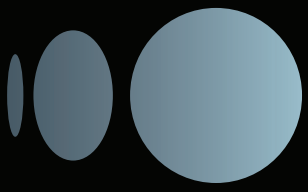


Bloomberg New Economy Forum

November 2021

Special Report • Bloomberg Economics

Long Covid

Jobs, Prices, And Growth In the Enduring Pandemic

BLOOMBERG NEW ECONOMY FORUM

SPECIAL REPORT • BLOOMBERG ECONOMICS
NOVEMBER 2021

The World Right Now

The Years Ahead

It's been almost two years since the first news of a novel virus in one Chinese city, yet Covid-19 continues to be the dominant force shaping the global outlook. The 2021 Bloomberg Economics report for the New Economy Forum speaks to the challenges the persistent pandemic poses for growth, inflation, and development.

We forecast the direction of major economies, and dig into what the looming Fed taper means for emerging markets. As price gains stay stubbornly high, we map out a more inflationary world. With asset prices elevated, we gauge bubble risk from the U.S. real estate market and Bitcoin.

Beyond the immediate impact, we explore whether the Covid shock could actually drive long-term productivity gains. With new economies' weaknesses exposed by the pandemic, we wonder whether the BRICs have been replaced by the BEASTs. And we model how a lost year of growth has affected poverty reduction goals in Africa.

Elsewhere, we draw on the rich universe of Bloomberg data to chart the evolution of the megafirm, and use a big model of the global economy to explore what U.S.-China decoupling and carbon pricing could mean for the future of trade.

Taken together, we believe the research gathered in this volume represents the best of Bloomberg Economics. We hope it can shed fresh perspective on important global debates, and on the conversation among leaders and opinion-makers at this year's New Economy Forum.

Stephanie Flanders and Tom Orlik
BLOOMBERG ECONOMICS

The World Right Now

The global outlook, the Fed's taper risk to new economies, bubbles from property to Bitcoin, and how Covid, China, and climate change are altering inflation dynamics.

It's Not Stagflation, But It's Not Good Either

By TOM ORLIK and BJÖRN VAN ROYE

AS THE COVID-19 THREAT PERSISTS, roads to economic recovery diverge. Bolstered by the U.S. and China, the path for global output still looks more like a "V" than anything else. Delve a little deeper, though, and the reality is an unappetizing alphabet soup of trajectories:

• Bloomberg Economics forecasts global gross domestic product growth of 6.6% in 2021 and 4.7% in 2022. Output won't quite be back on its pre-Covid path, but it won't be too far away either.

• In general, countries with abundant vaccines and ample stimulus are doing better than those without. But that's far from the complete picture. China's property slump, for example, is a threat that vaccines won't combat.

• Stagflation is too strong a word. But supply shocks keeping prices high and output low leave policymakers with no easy options. For now, with elevated uncertainty and little urgency to act, the major central banks are preserving their options.

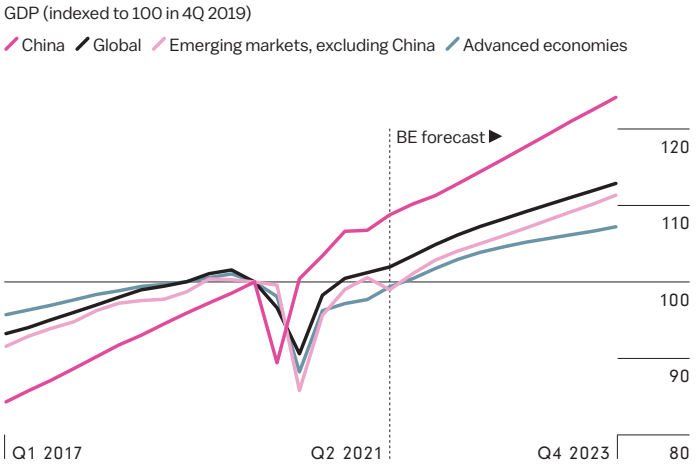
The pattern of recovery from the Covid crisis continues to defy straight-line forecasts and easy explanations. In general, getting the virus under control with a high vaccination rate should be the elixir for recovery. But as the chart on the next page shows, it's not that simple. In Europe, for example, despite high vaccination rates activity is some way from the pre-virus level. In China, the "zero Covid" strategy delivered outperformance in 2020, but in 2021 repeated lockdowns have hit spending, and a property slump and power shortages are set to drag on growth into 2022.

Pull the jagged pieces together, and, relative to our last forecast round, the outlook for global growth is weaker this year with some payback in the form of a somewhat stronger year ahead. Bloomberg Economics forecasts growth of 6.6% (down from 6.9% in our last forecast) in 2021 and 4.7% (up from 4.4%) in 2022. By 2023, growth should be moving back toward trend, which we estimate at about 3.2%.

Continued supply disruptions are keeping inflation elevated. Semiconductor shortages, port congestion, and a sharp rise in commodity prices are all conspiring to lift price gains well above forecasts from the start of the year, and substantially above central banks' target level. The view from monetary policymakers, and many in the market, is that the drivers of price gains are set to be short-lived, and inflation in advanced economies will return close to 2% in 2022.

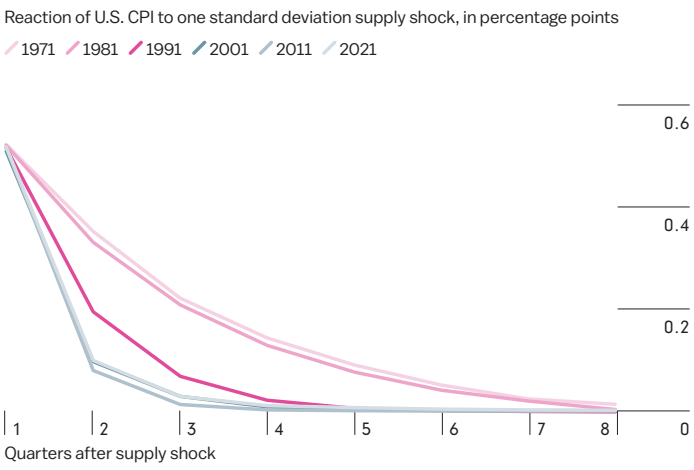
That's not entirely unreasonable. As the chart below shows, inflation driven by supply shortages doesn't stick around for long, and has stuck around even less in recent years than it did in the 1970s. Even so, we are less sanguine. Low vaccination rates in Asia—semiconductor hub Taiwan is lagging in getting two shots

'V' for Variation



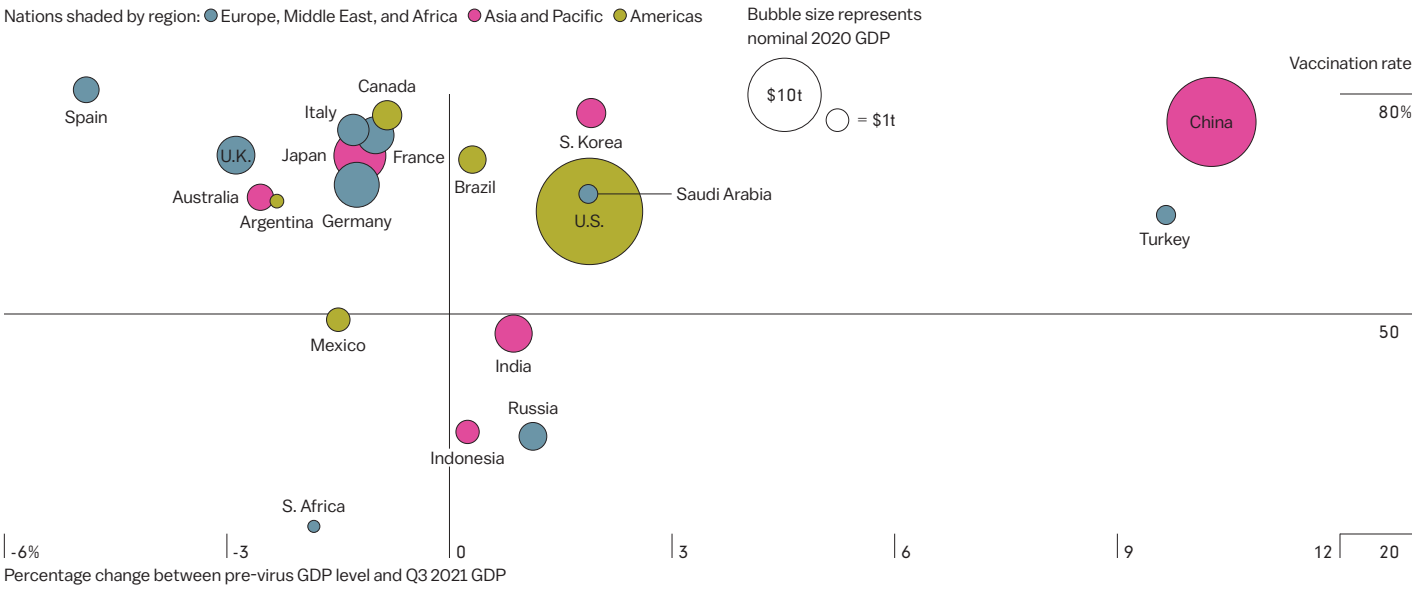
Source: Bloomberg Economics

Inflation Persistence Has Declined



Source: Bloomberg Economics

Vaccines No Elixir for Recovery



Source: Bloomberg Economics

to its population—mean the possibility of continued supply snarls. In the U.S., there are signs of inflation expectations moving higher. And a recovery getting back on track means higher demand will be adding to price pressure.

The second half of 2021 will mark the peak in inflation in the current cycle. But a magic melting away at the start of 2022 is far from guaranteed. In the U.S., we expect the consumer price index to end 2021 at 5.8% on higher energy prices, and to remain elevated at 3.5% in mid-2022. For many emerging markets, gains will run at an even more elevated level.

Stagflation isn't quite the situation. In the 1970s, U.S. inflation ran into double digits and unemployment was woefully high. In 2021 and 2022, inflation is above target but not stratospherically so and growth is slightly weaker than hoped. Still, even if the magnitude of the shocks is significantly smaller, the direction is the same. For central banks, the combination of higher inflation and weaker growth means no easy answers: tighten policy to control prices, and they add a further drag on the recovery; loosen to support growth, and they risk prices spiraling higher.

For now, in advanced economies, central banks are flagging concern about inflation but keeping their options open. Fed Chair Jerome Powell has said the taper of asset purchases will be done by the middle of 2022. That's at the early end of expectations, and opens the door to a potential liftoff on rates in the second half of next year. The Bank of England has indicated it may move even earlier, with markets now pricing in the possibility of a rate increase at the end of 2021.

For emerging markets, there's a more mixed picture. In China, with no sign of elevated factory prices hitting consumers and growing concern about the property slump, the People's Bank will likely be forced into an easier stance. We anticipate a cut in the reserve requirement ratio before yearend. Elsewhere, especially for emerging markets dependent on capital inflows, higher U.S. rates dragging funds out and still-stumbling recoveries requiring additional stimulus make an unwelcome combination.

Risks to the outlook aren't hard to find. In the immediate future, the U.S. debt ceiling debacle will likely be resolved without major incident—but 2011 provides a recent example of when the hit to market sentiment had a material impact. The China Evergrande Group default and contraction in property sales and construction raises the possibility of a repeat of 2015, when the Shanghai market slump rippled around the world. In the other direction, it's possible the unsnarling of supply chains, agreement on President Joe Biden's Build Back Better agenda, and more fiscal support in other major markets could mean a Goldilocks outcome with inflation subsiding and growth strong.

Uncertainty—needless to be said—remains elevated. In their latest meeting, almost all Federal Open Market Committee participants rated uncertainty on the outlook as above the average of the past 20 years. Policymakers have responded by preserving the maximum number of options. The Fed, for example, has wiggle room on the timing and details of the taper that can be used if conditions require. With a wide range of possible economic and market outcomes, investors would be wise to keep their options open, too.

Hot or Not? Economic Forecasts

Economies listed in descending order of projected 2022 GDP growth

1 India

2021/22 GDP growth: **7.4%/8.0%**
Central bank rate: **4%/4%**

With vaccination rates rising, an exit from lockdown should support a gradual recovery later this year and next. Weaker external demand, fiscal tightening, the impending taper of global liquidity, and rising input price inflation will prevent growth moving into high gear.

2 Indonesia

2021/22 GDP growth: **3.5%/6.3%**
Central bank rate: **3.50%/3.75%**

Slow vaccinations and the threat of the delta variant continue to weigh on Indonesia's recovery. Subpar growth and benign inflation could justify another rate cut, but that risks upending the rupiah. The central bank is likely to lean on bond purchases to support demand, making the next move in rates a hike in late 2022.

3 China

2021/22 GDP growth: **8.2%/5.6%**
Central bank rate (1Y MLF rate): **2.95%/2.85%**

Some of the luster has started to fade from China's recovery. Repeated lockdowns due to the delta variant, a property slump amid Evergrande default fears, and a further hit from energy shortages mean the economy is set to start 2022 on a weak note.

4 U.K.

2021/22 GDP growth: **6.3%/5.0%**
Central bank rate: **0.25%/0.50%**

Supply shortages are hitting the U.K. harder than most and are likely to mean slowing growth and rising inflation in the near term. Constraints should ease moving into 2022. High inflation and hawkish signals from the Bank of England have raised bets of a 2021 rate hike.

5 Saudi Arabia

2021/22 GDP growth: **3.8%/4.9%**
Central bank rate: **0.5%/0.5%**

For once, reliance on oil is serving Saudi Arabia well. Higher crude prices are filling the government's coffers and could even result in a reversal of last year's hike in value-added tax. Production could rise to ease the crunch in the global energy market, further boosting growth.

6 Singapore

2021/22 GDP growth: **6.2%/4.9%**
Central bank rate: **N/A**

With a vaccination rate above 80%, Singapore is transitioning to a new Covid strategy, with greater tolerance for new virus cases. The Monetary Authority of Singapore was the first in the region to tighten, steepening the slope of its currency band.

7 Euro area

2021/22 GDP growth: **5.2%/4.5%**
Central bank rate: **0%/0%**

Progress on vaccinations allowed a swift rebound in activity as containment measures were eased, and the deployment of European Union recovery funds should give the region an additional boost going into 2022. Still, a series of global shocks lifting inflation and hitting industry could keep the European Central Bank on edge as the economy enters a more difficult phase.

8 Canada

2021/22 GDP growth: **5.2%/4.4%**
Central bank rate: **0.25%/0.50%**

Canada's high vaccine penetration and strong job market favor quick recovery after a surprise contraction in the second quarter. Stretched supply chains will become the main restraint to activity and an upside risk to prices. Faster inflation means a higher chance of a late-2022 rate increase.

9 U.S.

2021/22 GDP growth: **5.5%/3.9%**
Central bank rate: **0.25%/0.25%**

The resurgence of Covid over the summer has slowed the U.S. recovery, but underlying private demand is expected to power a pickup into 2022. Supply chain bottlenecks that have kept inflation stubbornly high aren't showing any sign of easing, posing the risk that the Fed may lift rates in 2022.

10 South Korea

2021/22 GDP growth: **4.2%/3.2%**
Central bank rate: **1.00%/1.25%**

South Korea is riding out pandemic headwinds, setting the stage for another rate increase before yearend. Delta disruptions in major trading partners may lead to more snags along the way, but overall we expect external demand—especially for tech exports—to continue to underpin growth.

11 Japan

2021/22 GDP growth: **2.3%/3.1%**
Central bank rate: **-0.1%/-0.1%**

Japan's growth is likely to accelerate into 2022. New Prime Minister Fumio Kishida's debut, together with the country's vaccination drive, is helping buoy sentiment. This should unleash pent-up demand, which could take over from exports as a key growth driver. Fiscal support is an additional tailwind.

12 Turkey

2021/22 GDP growth: **9.2%/2.9%**
Central bank rate: **16.5%/14.0%**

Turkey's problem is inflation, not growth. The economy is set to expand rapidly this year, aided by strong base effects, but the lack of policy credibility means runaway price gains will persist. Premature interest-rate cuts will lead to further weakening of the currency.

13 Mexico

2021/22 GDP growth: **6.2%/2.7%**
Central bank rate: **5.25%/5.50%**

Mexico is set to decelerate as the boost from exiting lockdowns fades and the drag from the government's nationalist rhetoric remains. The central bank is likely to continue tightening to anchor inflation expectations and may match any Federal Reserve decisions to guard financial stability.

14 Russia

2021/22 GDP growth: **4.4%/2.5%**
Central bank rate: **7.25%/6.00%**

Russia remains in the throes of a delta variant wave, but the impact on growth looks mild. Solid demand is adding to supply shocks to push up inflation, prompting aggressive tightening from the central bank. A more pronounced slowdown awaits next year.

15 Argentina

2021/22 GDP growth: **7.5%/1.7%**
Central bank rate: **38%/35%**

The reopening of the economy and the return of foreign tourism may lend support to Argentina in the near term. The top priority in early 2022 is cutting a deal with the International Monetary Fund, which will likely involve higher rates, a weaker currency, and commitment to medium-term fiscal adjustment.

16 South Africa

2021/22 GDP growth: **5.3%/1.7%**
Central bank rate: **3.5%/4.5%**

South Africa has shown surprising resilience through the pandemic. However, repeat virus outbreaks and a slow vaccine rollout have combined with long-standing structural constraints to slow the initial bounce-back. Cooling commodity prices point to a continued loss of momentum in 2022.

17 Brazil

2021/22 GDP growth: **4.8%/1.2%**
Central bank rate: **8.0%/8.5%**

Brazil was bound to lose some steam on smaller fiscal stimulus and monetary tightening—on top of a water crisis and the menace of a full-blown power and water shortage. The combination of slow growth and high inflation will keep policy and politicians under pressure in an electoral year.

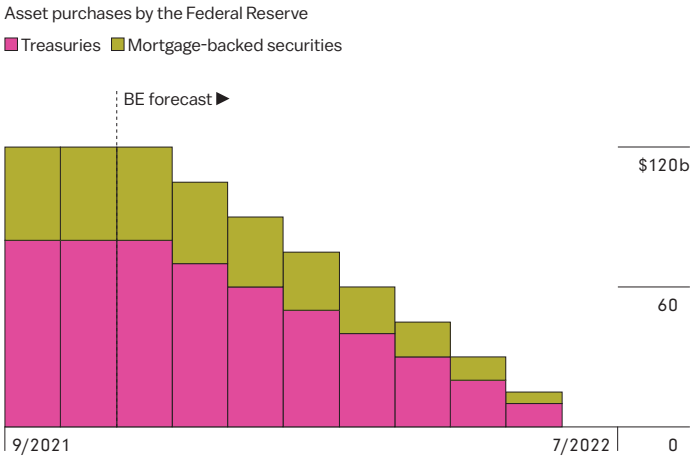
For New Economies, the Fed Might Trigger a BEAST of a Time

By ANNA WONG, BJÖRN VAN ROYE, and ZIAD DAOUD

A TAPER BY THE FEDERAL RESERVE in its pandemic bond-buying program starting at the end of the year appears close to a certainty. Bloomberg Economics' analysis suggests that could result in an increase in U.S. rates of about 40 basis points. For emerging markets still wrestling with the Covid-19 pandemic, the renewed threat of capital outflows could mean bad news. We see Brazil, Egypt, Argentina, South Africa, and Turkey—let's call them the BEASTs—as especially vulnerable.

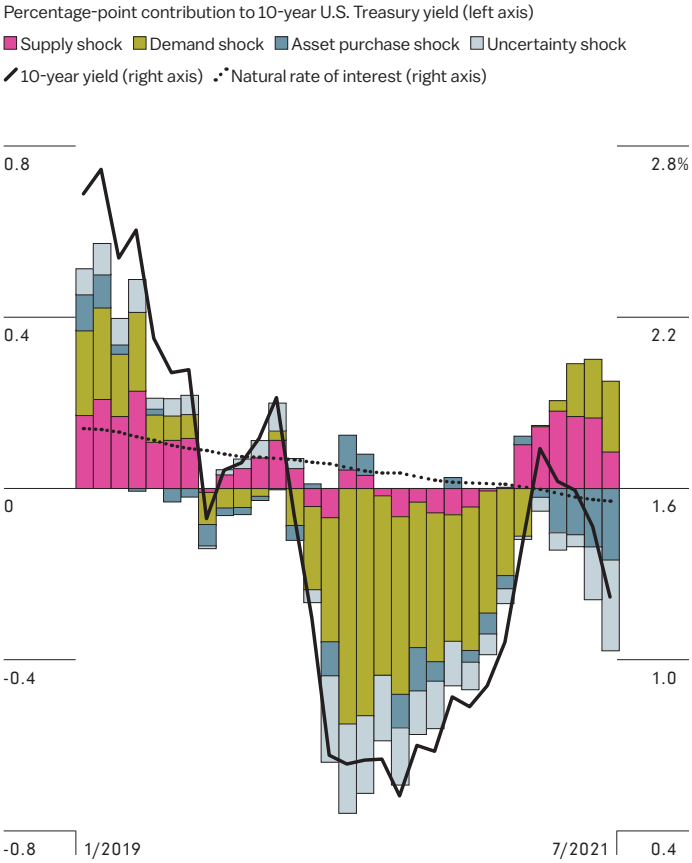
Never say never. A U.S. debt ceiling standoff triggering a collapse in market sentiment, a China property slump, or a reversal in labor market gains could yet put the timetable on hold. But barring bad fortune, the beginning of a taper for Fed bond

Going, Going, Gone



Source: Bloomberg Economics

The Fed's Taper and Reduced Uncertainty Should Lift Rates



Source: Bloomberg Economics

purchases near the end of the year appears close to a certainty.

Bloomberg Economics expects a taper announcement at the Fed's meeting in November, and the beginning of a drawdown in purchases in December. Following Chair Jerome Powell's signal that the taper will likely be complete by mid-2022, we expect purchases to be reduced at a pace of $15 billion a month.

Since quantitative easing started up again in March 2020—part of the Fed's response to the Covid crisis—asset purchases have acted like a giant vacuum, sucking up the supply of Treasuries and depressing yields. What will happen when the machine starts operating at lower power and—in the not-too-distant future—is turned off?

To answer that question, we use a structural VAR to disentangle the various forces driving the 10-year U.S. Treasury yield. The results show:

• Fed bond purchases have been a significant factor, depressing yields by almost 20 basis points in 2021.

• Uncertainty has been another drag, also reducing yields by about 20 basis points over the same period.

• With the Fed taper and a much-hoped-for reduction in uncertainty as vaccination rates rise, there's potential for U.S. yields to rise about 40 basis points.

What does that mean for new economies? In a Goldilocks scenario, not that much. Global borrowing costs will be higher, but that's because the U.S.—the world's biggest economy—is on the mend. The two effects crudely net out, and emerging markets are little affected. That's not necessarily how things will play out.

You don't have to delve too far into the history books to find an example of rising U.S. rates destabilizing emerging markets. In 2018, an 80-basis-point increase in the 10-year yield triggered capital flight, hit asset prices, and left emerging-market central banks with an impossible choice between cutting rates to support growth and raising them to prevent a sharp drop in the currency. A repeat is possible.

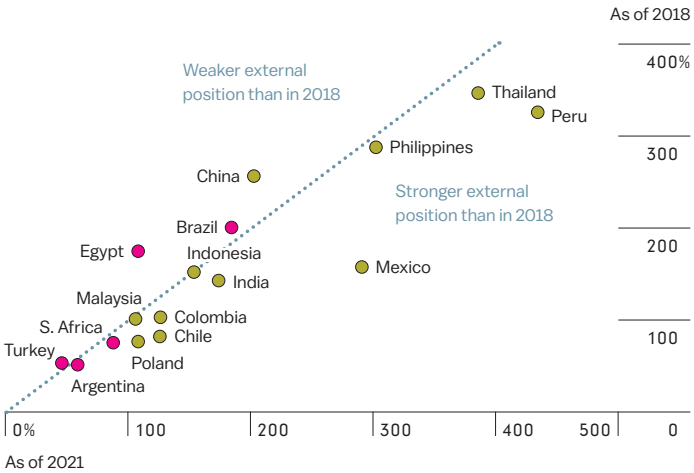
Who's Most Vulnerable?

• In 2018, countries with current account, external debt, and foreign exchange reserve weaknesses suffered most—Argentina, Brazil, and Turkey saw the biggest depreciation in their currencies.

• In 2021, Brazil, Egypt, Argentina, South Africa, and Turkey all look as bad or weaker on those dimensions than they did in 2018. If the Fed taper brings new trouble for emerging markets, they would face the greatest challenges. ●

A BEASTly Situation

Nation's foreign exchange reserves as percentage of its external financing needs*



*Sum of nation's current account deficit and its short-term external debt on remaining maturity

Source: Bloomberg Economics

The Fed Model That Called the '06 Home Crash Flashes a Warning

By DAVID WILCOX

IN 2005, FEDERAL RESERVE economist Joshua Gallin briefed the Federal Open Market Committee with a model-driven warning about a possible 20% overvaluation in the housing market. The rest, as they say, is history. Using the same method, Bloomberg Economics finds home prices are once again in troubling territory.

• The Fed staff model uses rents as a measure of fundamentals in the housing market. Depending on which calculation you look at, house prices today are either at or near all-time highs relative to rents. The previous high was reached during the runup to the 2007-08 housing crisis and followed by an epic collapse.

• The financial disaster that came out of that housing implosion is unlikely to be replayed. Banks are much better capitalized today, and the key regulatory reforms from the Dodd-Frank Act mostly remain in place. Nonetheless, real estate is an important driver of economic activity, and housing is the biggest asset on many consumers' balance sheets.

• If pandemic-related property demand wanes as Covid-19 recedes into the background, house prices could tumble. Caution is warranted on all sides.

The 'Science' of Detecting Bubbles

Bubbles are notoriously difficult to spot in real time, and with good reason: If they were easy to identify, the last person into the market wouldn't have paid so much. No one aims to be the last sucker into a market on the verge of a crash.

One technique has proved somewhat useful for identifying when prices are too high: looking at the cash flow being generated by the asset in question. If the price of the asset is high relative to that cash flow—watch out.

• In the stock market, where this technique was developed, the relevant cash flow is the dividend paid to shareholders. When stock prices are high relative to dividends, they tend to increase less quickly in the future and may even decline.

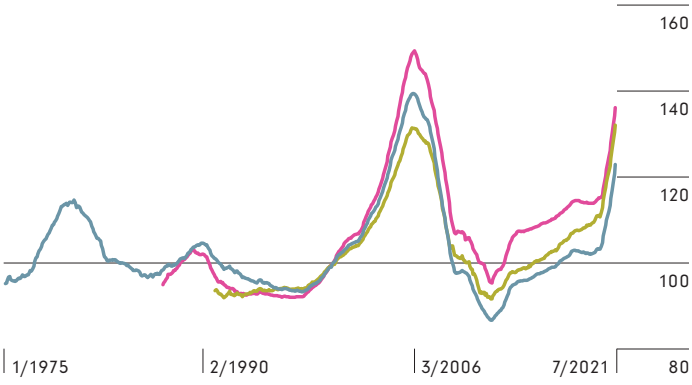
• The same principle applies in the housing market, with one important wrinkle. The relevant cash flow is the rent that the property could generate. The wrinkle is that most U.S. residential properties are owner-occupied. But the markets are sufficiently integrated that rent indexes provide useful information even for owner-occupied properties.

• Historically, when house prices have been high relative to rents, prices have tended to increase less rapidly in subsequent years. In some cases, they have declined sharply. The most extreme example was in 2006, when the price-rent ratio reached its all-time high. Over the subsequent four years, house prices adjusted for general inflation tumbled 26%.

Home Price-Rent Ratios at or Near Record Highs

Ratio of home price to the CPI for rent of primary residence, indexed to 100 in Jan. 2000

S&P CoreLogic Case-Shiller U.S. National Home Price Index
FHFA House Price Index ("purchase only")
Freddie Mac House Price Index*



*Incorporates several adjustments described in Gallin (2008).
Sources: S&P Dow Jones Indices; FHFA; Freddie Mac; Bureau of Labor Statistics

Measures, Measures

House prices are tricky to measure, and there's no universally agreed-upon superior gauge. Competing indexes are available from many sources. But several agree on one crucial point: House prices during the past half-century have never increased faster over any 12-month span.

Worse than just the rapid pace of price increases is the fact that house prices are high relative to the rents that could be generated from those properties. In fact, by one measure (the "purchase only" index published by Federal Housing Finance Agency), they are higher now relative to rents than they were in 2006. Two other measures are not at all-time highs, but they're close.

Historically, when the price-rent ratio has been this high, prices have tended to fall sharply in subsequent years. The chart at left closely replicates the method used in a 2008 paper published by the Fed's Gallin. House prices are measured using the same Freddie Mac index—adjusted in the same way—as Gallin used. The rent index has also been adjusted as in the Gallin paper.

The price-rent ratio is plotted against the horizontal axis, while the change in house prices (adjusted for general inflation) over the subsequent four years is plotted against the vertical axis. On average, as shown by the trendline, high values of the price-rent ratio have been followed by declines in real house prices.

In July (the most recent data available on house prices), this measure of the price-rent ratio was about 123.

• Since 1975, fewer than 8% of the quarterly observations in this series have been higher than the current level. All of those observations come from the period 2004-06—the runup to the housing collapse that triggered the global financial crisis.

• The dispersion of dots around the trendline is a useful reminder that a wide range of outcomes is possible. But in the one episode when the price-rent ratio was as high as or higher than it is now, prices fell sharply in inflation-adjusted terms over the subsequent four years.

To be sure, no one can foretell the future of house prices with accuracy. This time could always be different.

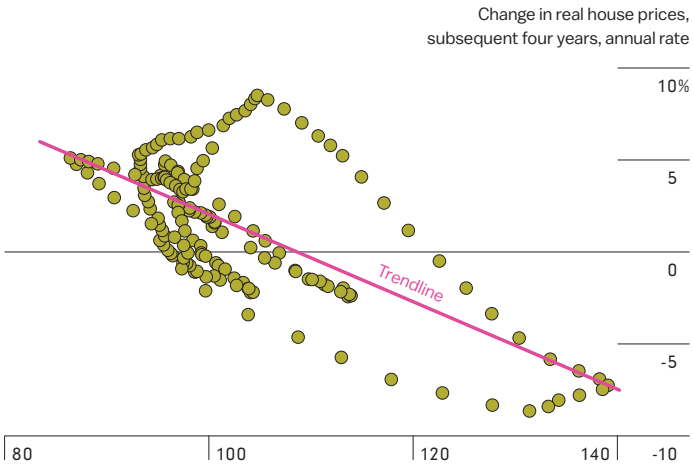
• For one thing, interest rates are at historic lows and look set to remain low—possibly rationalizing rich valuations in other asset classes including housing.

• For another, the financial system appears to be less fragile than it was in 2008. Banks have much more, and higher-quality, capital. Even if housing prices were to decline sharply, the odds seem much better that the financial system could withstand the shock.

Still, experience suggests that now is a good time to tread carefully in housing. ●

When House Prices Are High, They Tend to Fall

Price-rent ratios and subsequent price growth, Q1 1975 to Q2 2017*



*Based on Freddie Mac House Price Index.
Sources: Freddie Mac; Bureau of Labor Statistics; Bureau of Economic Analysis

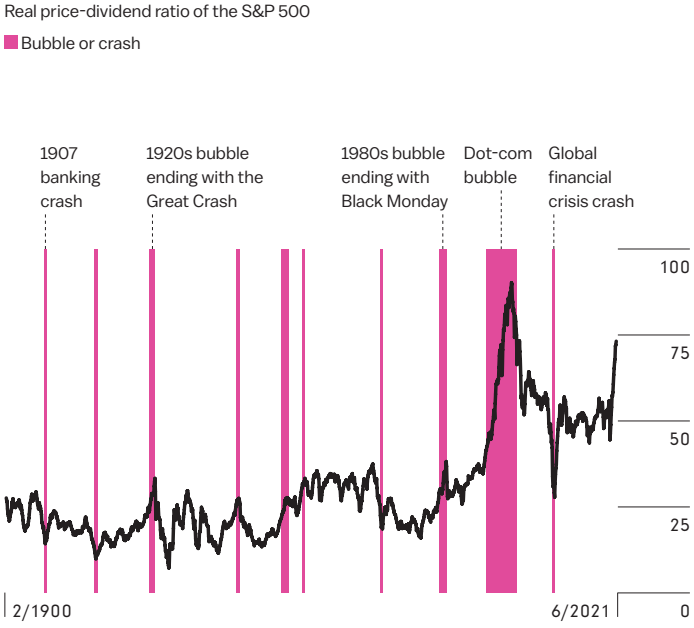
Pornography, Equity Bubbles, And the Risk to the U.S. Recovery

By ZIAD DAOUD

"I KNOW IT WHEN I SEE IT," U.S. Supreme Court Justice Potter Stewart famously wrote in a landmark ruling on pornography. Asset price bubbles, on the other hand, are notoriously hard to identify—so much so that successive Federal Reserve chairs have demurred from attempting to prevent them. Recent advances in econometrics provide a tool that can be used to track bubbles forming in real time. The latest results are not reassuring.

- Using a model that tracks the decoupling speed of equity prices from fundamentals, we find that the S&P 500 is on the cusp of bubble territory.
- The direct effect of a sharp correction of the stock market on the U.S. economy is small, mainly through cutting appetite for risk. The only recent occasion when a stock market crash has triggered a recession is the bursting of the dot-com bubble in 2001, and the downturn was mild.
- Still, coming at a moment when the U.S. is still limping out of the Covid-19 crisis, a crash would—at a minimum—be ill timed. For emerging markets, a risk-off moment triggering a flight to safe assets would compound existing stresses from the pandemic and the Fed's move to normalize policy.

Historical Bubbles and Crashes in the S&P 500



Sources: Robert Shiller's website; Bloomberg Economics

Bubbles and the Economy

Asset price bubbles can be damaging for the wider economy. When they pop, consumers feel poorer and abruptly withdraw spending. Companies find it more expensive to raise capital through either stock issuance or debt sales. Heightened risk aversion can also compound the adverse effects.

Should policymakers respond to bubbles? Former U.S. Federal Reserve Chair Ben Bernanke argued against a proactive approach in his first speech as governor in 2002; the inability to detect bubbles in real time was one of his reasons. But subsequent work by the academics Peter Phillips, Shu-Ping Shi, and Jun Yu gave a workable definition to equity price bubbles as well as an econometric technique to detect them as they're happening.

What Is a Bubble?

A financial bubble is a drastic deviation of the price of an asset from the income it generates. For example, investors buy stocks to receive dividends—these are the fundamentals of equities. A sharp decoupling of stock prices from the value of their dividends is a sign of a bubble.

Speculation is a crucial element in bubble formation. Investors will pay a higher price than justified by income only if they think prices will rise in the future. Bubbles form when enough people shift their investment thesis from "Will I make money by holding this stock and receiving its profits?" to "Will I be able to find someone to buy this stock at a higher price?"

Empirically, speculation results in an explosive increase in prices, not just a gradual rise. An explosive change in the price-dividend ratio is a sign that bubbles are present. The method developed by Phillips, Shi, and Yu gives a probability-like score ranging from 0 to 100 denoting the likelihood of observing a bubble. We use the conventional threshold of 95—scores above this level indicate a bubble.

A Bubble Now? Almost

This technique identifies 10 episodes of stock market bubbles since the beginning of the 20th century. It captures the equity booms of the 1920s and the 1990s as well as the crash that followed the collapse of Lehman Brothers in 2008.

Are equities in a bubble now? Based on the Phillips, Shi, and Yu methodology they're highly overpriced, almost in bubble territory.

• The bubble-detection method yielded a score of 94 in June—just below the threshold of 95 that flags a bubble. Not quite a bubble yet, but it's very close.

• Between February 2020 (just before the Covid crash) and June 2021, prices surged by 29% while dividends fell by 2%. The price-dividend ratio rose to 73, the highest ever outside the dot-com bubble.

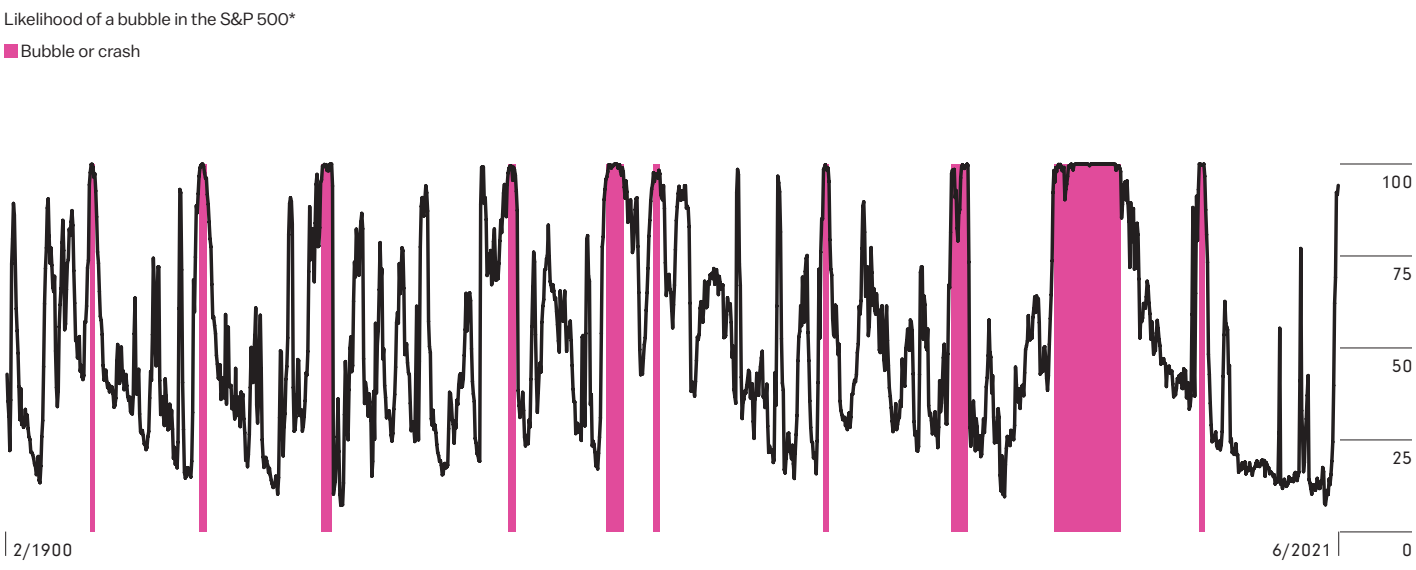
• The cyclically adjusted price-earnings (CAPE) ratio proposed by Nobel laureate Robert Shiller is also flashing red. CAPE divides prices by 10 years of earnings to smooth out the volatility in profits. It hit 37 in July, compared with an historical average of 17—its highest-ever score outside the dot-com bubble.

To be sure, equities may appear expensive compared with their own history but they're cheap relative to bonds—a point made by Shiller himself. But that provides little consolation for policymakers who have to worry about froth in not one, but two markets.

What Happens When Policy Turns?

The slashing of interest rates, lowering of taxes, and large government outlays have supported the post-Covid boom in stock prices. The withdrawal of stimulus could turn policy from a ►

Equities Close to Bubble Territory



*Phillips, Shi and Yu bubble score. Values greater than 95 signal a bubble.
Sources: Robert Shiller's website; Bloomberg Economics

supporter to a suppressor of the market.

What happens if the stock market boom turns to a bust? In isolation, the direct economic impact would be relatively small. Using Bloomberg Economics' modeling tool **{SHOK <GO>}**, a 10% decline in the stock market would leave U.S. gross domestic product about 0.3% smaller, chiefly through lower risk appetite. That's another reason policymakers are reluctant to react to stock market bubbles: They may rock financial markets but, considered in isolation, hardly appear in GDP numbers, as former Fed Chair Alan Greenspan argued.

For the global economy, a potential crash in U.S. equity markets adds to a collection of risks that could derail its recovery. The spread of coronavirus variants, U.S. debt-ceiling political games, China's property slump, an energy crunch, and higher interest rates all present potential stumbling blocks to sustaining global growth. A stock market bust would compound these risks and trigger a shift of capital to safe assets—emerging markets would be particularly vulnerable if this happens.

How We Detect Bubbles

Bubbles generate explosive movements in the price-dividend ratio. When Bernanke made his speech in 2002, standard statistical procedures at the time were inadequate to detect this. These methods just asked whether bubbles existed in the full sample rather than when they started and finished. Even then, because bubbles tend to subsequently collapse, standard techniques used to see the data as well-behaved rather than explosive.

In a 2013 paper, Phillips, Shi, and Yu designed a recursive procedure to overcome this. To test for a bubble at any point in time, they measure the maximum explosiveness over all backward-looking windows that end at the point of interest. The intuition is that while some subsamples containing collapsing bubbles may underestimate the degree of persistence, others would successfully capture bubbles because they wouldn't contain past crashes.

In technical terms, the old literature relied on standard unit-root tests to detect bubbles over the whole sample. In contrast, to test if there was a bubble in June 2021, for example, Phillips, Shi, and Yu use all the subsamples of the data ending in June. Collapsing bubbles in the 1980s or early 2000s may contaminate some subsamples, but others will capture only the latest spike in the market—and these are the ones that will dominate the testing decision.

For data, we obtain monthly real price-dividend ratios for the S&P 500 index from Shiller's website. The sample spans the period from January 1871 to June 2021. ●

What Happens When a Bubble Is Detected?

				% Change 2 quarters after bubble detection		% Change 2 quarters after the bubble ends	
Bubble name	**Start date**	**End date**	**Boom or crash**	**S&P 500**	**Real GDP**	**S&P 500**	**Real GDP**
Bubble preceding the Great Depression	Sept. 1928	Sept. 1929	Boom	25.4	N/A	-23.5	N/A
Post-war boom 1940s	Oct. 1945	June 1946	Boom	10.2	N/A	-20.4	N/A
Second post-war boom	Sept. 1954	April 1956	Boom	17.9	4.9	-1.7	1.6
Brief late 1950s boom	Jan. 1959	Aug. 1959	Boom	5.8	2.3	-4.3	2.5
The 1974 crash	July 1974	Jan. 1975	Crash	3.6	-1.6	11.6	2.4
Bubble preceding Black Monday	Mar. 1986	Sept. 1987	Boom	9.8	1.4	-19.0	2.2
Dot-com bubble	July 1995	Aug. 2001	Boom	12.7	1.4	-1.9	1.1
Global financial crisis crash	Oct. 2008	April 2009	Crash	-2.1	-1.3	22.0	1.4

Sources: Bureau of Economic Analysis, Bloomberg, Bloomberg Economics

Time to Worry About Inflation? Bitcoin Price Model Says 'Yes'

By BJÖRN VAN ROYE

WHAT'S DRIVING THE SUDDEN RISES and sharp drops of Bitcoin? True believers hold that the cryptocurrency provides a hedge against everything from inflation to the end of the world. Skeptics see a momentum-driven trade where novice investors risk losing their shirts. Our model shows both versions have an element of truth, with recent price action fueled by inflation fears and speculative spirits:

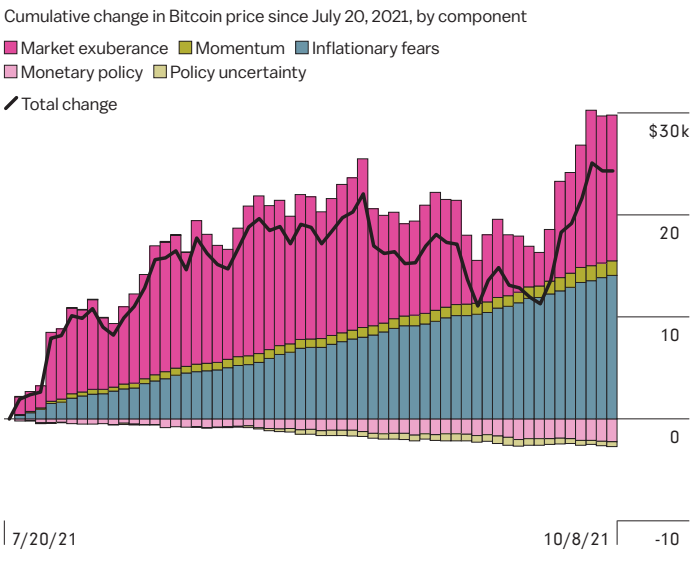
• We've built a structural empirical model that exploits the co-movement of prices for Bitcoin and other assets to determine what factors are driving the ups and downs of the digital currency.

• The model shows that since the end of July, the starting point of the latest Bitcoin cycle, about half of returns can be explained by market exuberance and momentum trading, and about half by inflation fears.

• The analysis also reveals differences between the factors driving gold and those driving Bitcoin. For gold, uncertainty plays a larger role. For Bitcoin, it's fear of inflation.

• Finally, our model shows that for Bitcoin the importance of inflation and hedging against uncertainty become more important drivers over time, accounting for 50% of price moves in the latest cycle relative to 20% in 2017.

Decomposition of Bitcoin Price Drivers



Source: Bloomberg Economics

• We note that our model is sensitive to choice of variables, the model structure, and identification strategy, as well as the estimation sample.

Modeling Drivers

Structural empirical models attempt to explain the behavior of one variable through its co- or contrary-movement with others. One method to disentangle the underlying drivers is to impose sign restrictions on the variables.

For example, a simple sign-restriction model attempts to understand the drivers of oil prices by tracking the relationship with equity prices. In periods where oil moves in the same direction as equities, that's considered a demand shock—with expectations of rising activity pushing up both energy use and company earnings. In periods where they move in opposite directions, that's considered a supply shock.

We consider several factors in our model:

• Market exuberance: If Bitcoin moves in the same direction as the S&P 500, we attribute that to market exuberance.

• Momentum: If Bitcoin moves in the same direction in the current period as past periods while equity prices remain unaffected, we attribute that to momentum.

• Inflation fear shock: If inflation expectations and equity prices move in different directions we interpret that as market fear of runaway inflation or a deflationary slide.

• Uncertainty hedge: If equity prices move in the opposite direction as the Baker, Bloom, and Davis U.S. Economic Policy Uncertainty Index, we interpret that as investors hedging against uncertainty.

• Monetary policy shock: If the one-year Treasury yield moves in the opposite direction to inflation expectations and equities, that's attributed to a monetary policy surprise.

In any given period, many different factors may be driving the price of Bitcoin. What our model does is disentangle the relative importance of those factors. The first table on the next page shows the complete set of variables and sign restrictions we have in place. Further details are in the final section on methodology.

The results show that from July 20 to Oct. 8, the dominant factors affecting Bitcoin were market exuberance and fear of inflation. Taken together, these two elements explain all gains of the price movement. Other factors—economic policy uncertainty (−8%) and monetary policy surprises (−2%)—have recently dragged on the price.

Bitcoin or Gold: Comparing the Drivers

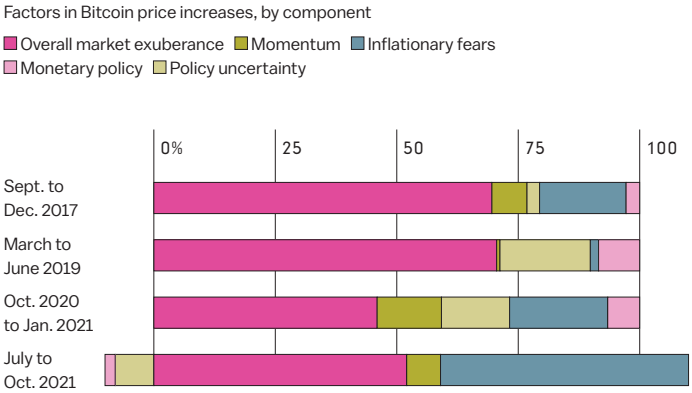
Bitcoin is often compared to gold, with similar properties as a hedge against inflation and uncertainty. By replacing Bitcoin with gold ►

Variables, Sign Restrictions for Bitcoin Price Model

	Market exuberance shock	Momentum shock	Uncertainty shock	Inflationary fear shock	Monetary policy shock
Economic policy uncertainty	0		+		
S&P 500	+	0	–	–	–
1-year Treasury yield	0				+
10-year inflation expectations	0		0	+	–
Bitcoin price	+	+			

Source: Bloomberg Economics

Contributions to Bitcoin Price Gains for Four Cycles



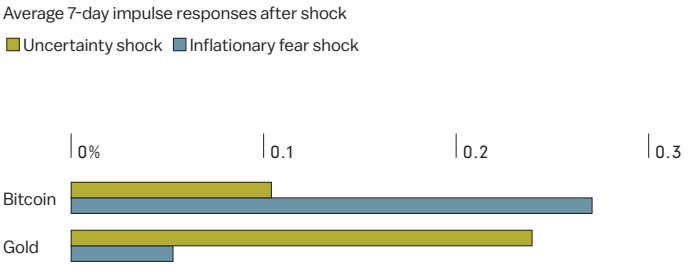
Source: Bloomberg Economics

in our model, we can compare the relative strength of different factors in driving the two assets. As the chart below shows, gold appears to have been more widely used as a hedge against uncertainty, while inflation hedging has a larger role in driving Bitcoin.

A 100-point gain in the U.S. Economic Policy Uncertainty Index leads to a 0.25% increase in the gold price—more than double the impact on Bitcoin. On hedging inflation, the roles are reversed. Bitcoin prices rose by an average 0.25% after a 10-basis-point shock to inflation expectations. The gold price only increased by 0.05%, on average.

Finally, we can also use our model to explore how the drivers of Bitcoin have changed over time. In particular, we look at the four periods of sharp price movements: the rally from October to December 2017, the boom in prices in the second quarter of 2018, the price surge from October 2020 to January 2021, and the latest rally. The results, shown in the chart above, suggest that concerns about inflationary pressures have been more important drivers in the latest price cycle than in the past, when market exuberance and momentum accounted for more than 70% of the increase.

Elasticity of Bitcoin and Gold to Uncertainty and Inflation



Source: Bloomberg Economics

Methodology

We use a small structural VAR model, which we estimate with Bayesian techniques. In the estimation we include five endogenous variables in daily frequency: the logarithm of the Bitcoin price, the logarithm of the S&P 500, the logarithm of the Economic Policy Uncertainty Index for the U.S. developed by Baker et al., the 10-year TIPS/Treasury break-even rate, and the one-year Treasury yield. Estimation period ranges from Dec. 8, 2016, to Oct. 8, 2021. The model is estimated with seven lags in a standard Minnesota prior setup. For the analysis of the gold price, we use the same set of variables.

We follow the methodology by Arias et al. (2018) by combining sign and zero restrictions to identify meaningful shocks. Sign and zero restrictions are only imposed on impact (same day restriction). To achieve convergence, we draw 10,000 burn-in iterations and use the remaining 30,000 draws for the posterior distribution of the parameters. All estimations are done with the new version of the BEAR toolbox.

The large swings in Bitcoin may incur nonlinear relationships with the remaining variables; this isn't captured by our linear model. For the point estimates for the historical decomposition, we use the median of the posterior distributions of the respective parameters; for each point estimate there is considerable uncertainty around the parameter estimates. ●

Goodbye, Disinflation. Let's Meet Bankers' Next Challenge

By BILL DUDLEY

DISINFLATION HAS BEEN AN ECONOMIC hallmark of the past few decades, in the U.S. and around the world. Central banks have worked to keep inflation from falling consistently below their targets and public expectations about inflation well anchored. As the global economy has begun to recover from the Covid-19 pandemic, however, inflationary pressures have become more pronounced. Is this just a transitory phenomenon, or is a long period of disinflation and friendly central bank policy ending?

To answer, we have to explore why disinflation occurred and whether the factors behind it are finally changing. Of course, it's important to remember that inflation is ultimately a monetary phenomenon. If central banks do their jobs well, they should be able to keep it in check even when global economic forces are changing.

In the past few decades there have been a number of powerful disinflationary forces. First, the rise of globalization and the emergence of China as the leading global exporter led to persistent decline in the price of goods. As Fed Chair Jerome Powell pointedly noted at this summer's Jackson Hole symposium, durable goods prices in the U.S. had, until last year, fallen in every one of the preceding 25 years.

Second, rising income and wealth inequality in the U.S. and an aging population in advanced economies led to a global savings glut. Inflation-adjusted short-term interest rates have fallen below zero from more than 3% during the late 1990s. This has made it harder for central banks to use monetary policy to push their economies beyond full employment, a necessary outcome for boosting wages and inflation. Japan has been the poster child here, with its inflation rate below target and short-term rates near zero for several decades.

The aging of the population has also contributed to a decline in the unemployment rate consistent with stable inflation. During the last business cycle, before the pandemic hit, Fed officials were surprised that they could push the unemployment rate down to 3.5% without generating a pickup in wage and price inflation.

Low inflation was also sustained by central banks' willingness to tighten monetary policy preemptively. Until the fall of 2020, the Federal Reserve had always sought to achieve 2% inflation even when it had persistently missed this target to the downside. The strategy resulted in inflation expectations falling below 2%, which, in turn, put downward pressure on inflation.

There are reasons to think the environment is changing:

• The trend toward increased globalization may be ending. At a minimum, companies will be building more redundancy into their supply chains and holding higher inventories as a precaution against disruption. In economic areas that are deemed to have technological and strategic importance, the U.S. government may force companies to lessen their reliance on Chinese suppliers.

• The disinflationary effect of hundreds of millions of Chinese laborers moving from the countryside to cities is over. China no longer has a huge reservoir of underutilized workers. In fact, the country faces a potential labor crunch. Its one-child policy means that the Chinese working age population will continue to shrink for several decades.

• The global savings glut may abate as the baby boom generation retires. When people stop working, their saving rates decline.

Governments Just Keep Borrowing

On the other side of the ledger, governments are now more willing to run persistent budget deficits. The economic orthodoxy on ►

fiscal policy has changed drastically over the past decade. In the immediate aftermath of the great financial crisis, the conventional wisdom was that government debt-to-gross domestic product ratios beyond 90% or so were dangerous. Now, with real interest rates at rock-bottom levels, the view is that there is plenty of fiscal capacity to support expansive tax and spending policies funded by government borrowing.

The need to respond more aggressively to climate change may also raise investment significantly. For example, it will take a lot of capital to move the global motor vehicle industry from fossil fuels to electric power. Also, as destructive weather proliferates, considerable infrastructure spending will be necessary to protect capital—such as residential property and ports—in vulnerable locations or to replace this capital in areas less exposed to extreme weather.

How worried should we be about a rise in global inflation? The factors above suggest that it will be easier for inflation to take root if central banks aren't vigilant. But, if central banks do their jobs, there is no reason to worry. They are starting from a good position: Inflation expectations are well anchored, and they have the tools to keep inflation in check. A tighter monetary policy can throttle back spending to prevent economic overheating.

The Risks Ahead

So what could go wrong? As I see it, there are two main risks. The first is that central banks may be too focused on fighting the last war: disinflation and getting stuck at the zero lower bound for interest rates. For example, last year the Fed made an important shift in its long-term monetary policy framework. It had previously always targeted 2% inflation in each period, regardless of past misses; now the Fed has committed itself to target 2% inflation on average, allowing inflation to move higher to make up for past misses. Most important, the Fed implemented this framework by committing to not tighten monetary policy until the economy had reached maximum sustainable unemployment consistent with its 2% inflation objective, plus inflation had reached 2% and was anticipated to exceed 2% for some time in the future. This commitment means that the Fed will not even begin to raise short-term interest rates until monetary policy needs to be tight. As a result, the Fed will likely be late, introducing a pro-inflationary bias to U.S. monetary policy.

The second risk is of "fiscal dominance," in which rising fiscal burdens clash with the need for central banks to raise short-term rates to keep inflation under control. Since 2008, the U.S. federal debt has more than tripled, but debt service costs have increased only marginally as interest rates have tumbled. However, when the Fed ultimately tightens, higher interest rates will push up debt service costs, worsening the fiscal outlook. Although I don't think the Fed will blink when the time comes, it's fair to say that it will be much less popular in Washington when it's taking away the punch bowl than it was when it was buying Treasuries and mortgage agency securities, keeping interest rates and debt service costs low and financial markets buoyant.

Central banks have the tools to keep inflation in check. But they don't control how difficult the inflation environment will be. After several decades of disinflation, which has pushed interest rates to record lows, the pendulum appears to be swinging back in the direction of much tougher choices for central bankers.

The key question is: Central banks have the tools and means, but will they have the will to act when the outcome of their actions will be much more painful and politically unpopular? ●

How Inflation Could Catch Central Banks on the Wrong Foot

By DAN HANSON

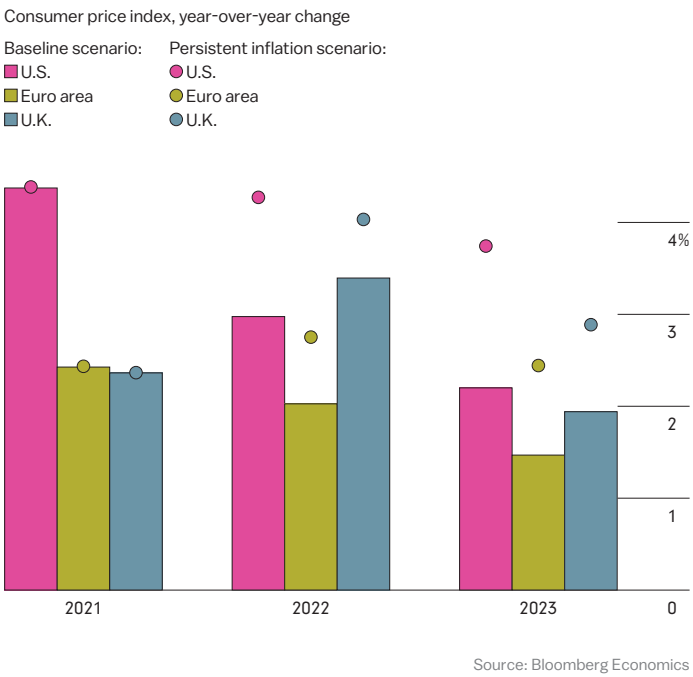
INFLATION ARRIVED WITH A BANG in 2021. The world's major central banks are almost unanimous in the belief that it won't last. But what if that's wrong, and inflation proves far more durable? In that scenario, with their credibility on the line, policymakers are likely to act forcefully.

• The combination of more persistent demand and supply imbalances combined with expectations that inflation will remain elevated is the fastest route to durably higher inflation.

• Using **{SHOK <GO>}**, Bloomberg Economics' general equilibrium models of the U.S., euro area, and U.K. economies, we model a scenario where the output gap is 1 percentage point narrower in the year ahead than in our baseline forecast.

• Onto that we layer a shift higher in inflation expectations. We have assumed workers and companies will use the experience of 2021 as a guide for future inflation, negotiating wages and setting prices accordingly.

The Path to Higher Inflation



Source: Bloomberg Economics

• If that occurs, our model shows inflation in the year ahead moving significantly above current forecasts in all three economies.

• That shock would most likely see the Federal Reserve, European Central Bank, and Bank of England all bring forward the point at which they begin raising interest rates.

Transitory Inflation Remains the Baseline

A bout of inflation around the globe was always in the cards this year as base effects from 2020's rock-bottom energy prices boosted the annual comparison. The bigger surprise has been the extent to which demand has outstripped supply as economies reopened, pushing prices up further than expected.

Our baseline view—and the almost unanimous thinking from central bankers—is that these supply constraints will dissipate in coming months, which means annual inflation will begin to fall back next year. In the U.S., euro area, and U.K., we see price gains slowing in 2022 as slack in the labor market weighs on wage gains and the surge in prices associated with the reopening of economies isn't repeated.

What Could Go Wrong?

It's not hard to think of scenarios where demand outstrips supply for a more sustained period.

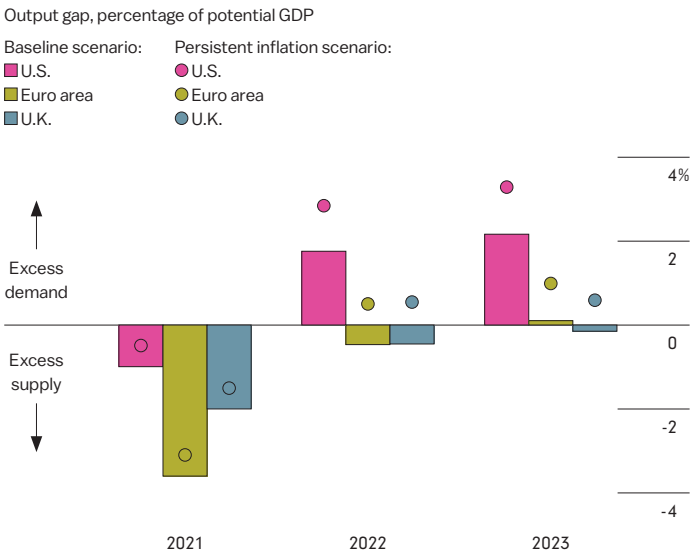
• Demand may have more momentum than we have assumed. Households around the globe are sitting on trillions of dollars in pandemic savings. If that's spent more quickly than we've assumed, it would put a rocket under the recovery.

• Supply, not demand, may surprise—and to the downside. Supply chain disruption and labor shortages may prove persistent. There might also be a prolonged period of adjustment to the post-Covid-19 reality for workers and companies, affecting the economy's productive capacity.

In a world where the demand and supply imbalances are more long-lasting and price pressure continues to mount, the big concern is that there's a shift in inflation psychology. With the cost of living soaring, workers could seek to take advantage of their increased bargaining power and demand higher wages. Companies could be more willing to grant pay increases if they think their competitors are doing the same. It's this dynamic—an unmooring of inflation expectations—that central banks fear the most.

To explore how that could play out, we created a scenario for the U.S., euro area, and U.K. where output gaps in the year ahead narrow by a percentage point more than suggested in our baseline forecast. Normally that would be a significant shock to ►

More Overheating



Source: Bloomberg Economics

the forecast. With the uncertainty surrounding the Covid-19 recovery, it looks modest and plausible.

To illustrate what that might look like in practice, consider that U.K. households have accumulated some £180 billion ($246 billion) in lockdown savings. In our baseline forecast for the year ahead, they spend a little less than £10 billion of that. If they spent an additional £25 billion, that would add enough demand to narrow the output gap by an additional percentage point.

In our baseline forecasts expectations remain anchored at levels consistent with the inflation target in each country. For the shock, we have assumed that 2021 experience acts as a guide for 2022 expectations. For the U.S. that means workers and companies expect 4.3% CPI inflation next year; for the U.K. and euro area that number is assumed to be 2.4%.

Inflation Would Be Faster

The combination of those two shocks—more protracted demand and supply imbalances and an unmooring of inflation expectations—would materially alter the path of inflation over the next 12 months.

• In the U.S., the shock would add 1.3 percentage points to the annual change in the consumer price index, pushing it to an average reading of 4.3% in 2022.

• In the euro area, price gains would average 2.8% in 2022, compared with our baseline forecast of 2%.

• In the U.K., instead of dropping back swiftly next year from 4% at the end of this year, inflation would stay at that level—substantially higher than the 3.4% in our baseline.

Earlier Tightening?

Faced with a scenario where high inflation was becoming a self-fulfilling prophecy, **{SHOK <GO>}** suggests the Fed, ECB, and BOE would all respond with early and aggressive tightening.

Although models don't fully capture the rich reality of monetary policymaking, we think it's right to assume each central bank would respond earlier and more forcefully to the shock. After all, their credibility would be on the line.

• For the Fed, our base case is for tapering in the fourth quarter of 2021 and a first rate increase in 2023. In the demand-boost scenario alone, the limited impact of a narrower output gap on inflation in our model means the central bank could be patient. However, add in unmoored inflation expectations, then an accelerated taper and 2022 rate increase would be likely.

• For the ECB, our base case is that net asset purchases will be over by the start of 2024. A first hike in the deposit rate follows late in the second quarter, with the main refinancing rate rising at year end. Stronger demand and higher inflation could move the process forward a year. Timing in relation to the Fed would be an additional consideration.

• The BOE has signaled it's prepared to lift rates this year. In our view, the fastest route to a 2021 rate increase is evidence of inflation expectations becoming unmoored. Should gauges of expectations start to reflect that, a move in December would be in the cards. Our current baseline is for a hike in May. We'd also expect a further hike in the first half, taking rates to 0.5%. That's the point at which the central bank has signaled it will start reducing its balance sheet.

Economists complaining about uncertainty are like sailors complaining about the sea. In the recovery from a once-in-a-century pandemic, though, it's fair to say that uncertainty is unusually high. As our analysis shows, for the U.S., euro area, and U.K. it wouldn't take too much of a shift to turn transitory inflation into something more durable, forcing central banks to respond earlier. ●

How the Alibaba Effect Will Save China From Rising Prices

By CHANG SHU, DAVID QU, and ERIC ZHU

COULD SHARPLY RISING FACTORY GATE prices result in sticker shock for China's shoppers and turn made-in-China goods from drivers of global deflation to inflation? Probably not: China's domestic inflation process has changed, and so has the impact of China's prices on the rest of the world.

• Bloomberg Economics' analysis suggests that micro factors—with the rise of services and e-commerce the leading candidates—could be outweighing macro factors as the new driver of China's inflation dynamics. As a consequence, even when the economy overheats, higher producer prices don't pass through to consumers.

• China's impact on global inflation has also changed. Our analysis shows that cheap imports from China have stopped dragging on global prices, but rising labor costs and other factors haven't yet turned the world's factory into an exporter of inflation.

From Macro to Micro: What's Behind Low-flation?

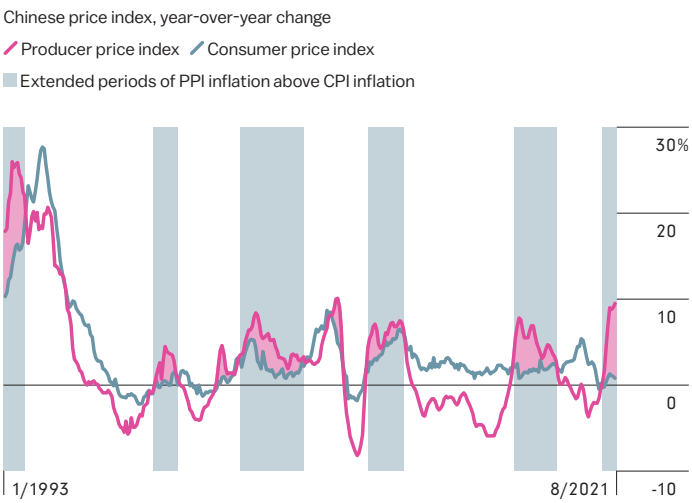
China's recent episode of high factory gate inflation—with the producer price index (PPI) close to a 10% annual increase over the summer—followed several similar cycles in the past three decades. A period of rapid price gains after the liberalization of the 1990s was followed by deflation in the 2000s, partly because of lower tariffs after China joined the World Trade Organization (WTO). Since then, there have been periods of high inflation driven by strong demand and commodity prices, and of low inflation with overcapacity depressing prices.

In the latest episode, the most notable feature is the wide gap between high PPI and low consumer price index (CPI) inflation. At an average of 5.6 percentage points over the first eight months of 2021, the gap is by far the largest since 2000.

There are some idiosyncratic factors at work. Low pork prices are one important reason China's consumer prices have stayed low this year. Still, the historically wide gap between the PPI and CPI also suggests some structural factors at play.

Using data over the past three decades, we employ causality and regression analysis to explore the impact on the PPI-CPI gap of macroeconomic factors, including supply and demand imbalance, commodity prices, financial conditions, and asset prices. The results show that, considered as a group, macro factors play a significantly smaller role in explaining the current divergence.

China's PPI-CPI Gaps



Sources: National Bureau of Statistics of China; Bloomberg Economics

Why Might That Be the Case?

One important difference between 2021 and previous episodes of rising factory prices is the rise of online shopping. The share of online-goods shopping more than doubled, to almost one-quarter of retail sales in 2021, from just over 10% in 2015. With Amazon, Taobao (Alibaba), and others making price comparisons much easier, intense competitive forces are making it harder for businesses to pass on higher production costs to end users.

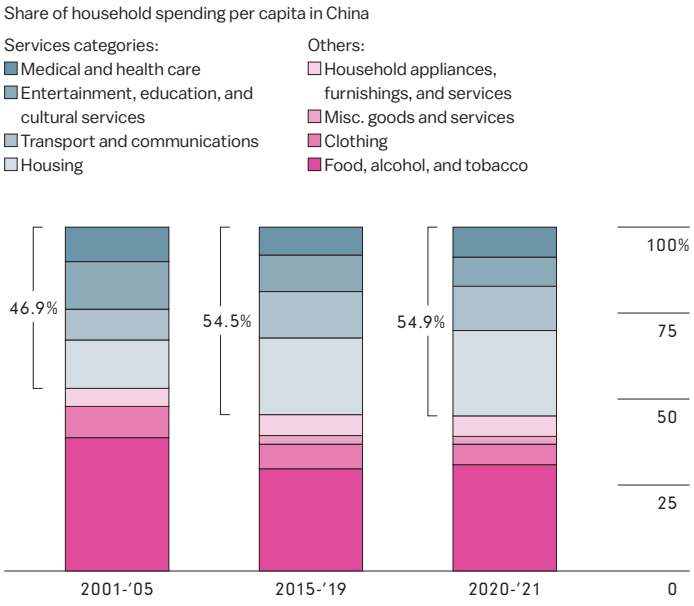
The e-commerce drag on consumer prices is expected to continue. More traditional goods sellers are operating on e-commerce platforms, and services have started to move online—supporting the next phase of internet shopping. Assuming the average growth seen in the three years before the Covid-19 pandemic continues, online spending could approach 40% of total retail sales in 2024, according to Bloomberg Economics projections.

The shift to services consumption is another key factor. Spending on services—including housing, education, and transportation—accounted for 54.5% of household expenditure in the five years before the pandemic. The share continued to edge up in 2020 even with considerable restrictions on services spending due to the lockdowns and social distancing, leaving the services share 8 percentage points higher than it was two decades ago. This means the fraction of prices in the consumer basket that can be impacted by producer prices has declined.

China's Impact Goes From Small to Smaller

China's share of global trade has grown substantially in the last few decades. From $62 billion in 1990, China's exports have grown ►

The Rise of Services in Consumption



Sources: National Bureau of Statistics of China; Bloomberg Economics

more than 40-fold, to about $2.6 trillion in 2020, and the country has been the world's largest exporter since 2009. For the major economies covered by Bloomberg Economics, the average share of imports from China has jumped from 2% in 1990 to 16% in 2015. The share largely stabilized after 2015 before picking up again during the pandemic.

China's rise as a major exporter has coincided with a period of low inflation in advanced economies. In emerging markets the disinflationary process was even more pronounced.

Cheap exports from China—a large, low-cost producer—are widely viewed as one of the factors weighing on global prices. If that's true, then higher producer prices from China should now pose a threat in the other direction, with a risk that the world's factory may switch from exporting deflation to exporting inflation.

To examine the global impact of China's inflation, we use a panel regression to look at the experience of eight advanced economies and 13 emerging economies from 1994-2020, taking into account demand conditions and global commodity prices.

The results show that China did affect inflation developments in other economies over the past three decades, but the impact was small and has diminished in recent years. Also noteworthy: The impact was seen in advanced economies, not emerging markets.

• PPI inflation in China affects developed-market economies' inflation even when factors such as demand and global commodities are taken into account.

• The impact is small: Over the past three decades, a 1% rise in China's PPI inflation would lead to a rise of about 0.04 percentage point in PPI in advanced economies.

• The impact is weaker for CPI inflation than PPI inflation. This isn't surprising given the greater weight of services in the CPI basket.

• The influence of China's inflation peaked in the early 2000s, when China joined the WTO, and declined to almost negligible size in recent years.

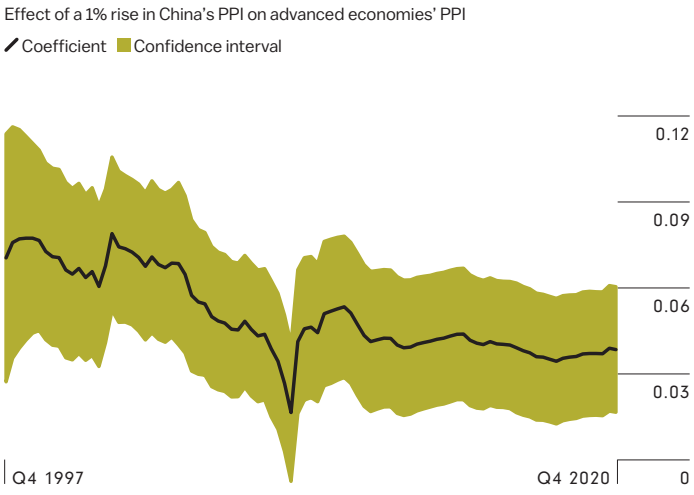
Two Factors in the Diminishing Impact

• Chinese inflation's initial impact on developed-market economies' inflation could be considered as the latter's convergence to lower prices. After the level shifts—even if it takes a number of years—the impact on inflation dissipates.

• With huge imports for production, China is also increasingly susceptible to volatility in commodity prices. As such, inflation in China and other economies is driven by common factors such as global liquidity conditions and commodity prices. This being the case, China's inflation now has almost no independent influence on global inflation.

Pulling the pieces together, our analysis suggests that China's online, services-oriented economy is providing inoculation against inflation at home, and—looking to China's impact on trade partners—while the world's factory has stopped exporting deflation, it hasn't started exporting inflation either. ●

How Chinese Inflation Spillovers Evolve



Source: Bloomberg Economics

Cloudy With a Chance of Stagflation: Climate Change and Central Banks

By DAVID POWELL and MAEVA COUSIN

WITH CARBON PRICING DIRECTLY raising production costs, extreme weather events hitting supply chains, and higher temperatures crimping potential growth, the impact of climate change on inflation is set to be far reaching. Bloomberg Economics' review of the evidence suggests that in the years ahead the world may face something like a repeat of the 1970s oil shocks, when the combination of rising inflation and weak growth left monetary policymakers with no easy choices:

• In a best-case scenario—keeping both the planet and central bankers cool—the increase in carbon prices needed to get to zero emissions starts immediately and proceeds gradually. If that happens, advanced economies would face a temporary period where inflation runs about 1 percentage point above target. In the U.K., for example, that would mean 3% annual price gains, above the Bank of England's 2% target.

• If the world waits too long, and carbon prices have to be jacked up more rapidly to achieve net-zero emissions, the impact on inflation would be doubled, running 2 percentage points above target annually. If that happens, the choice for the central banks—to bolster growth with rate cuts or to fight price gains with rate increases—would be a difficult one.

• Beyond the direct impact of carbon pricing, a hotter planet with more extreme weather events would likely mean inflation that's on average lower but more volatile. A lower natural rate of interest—the result of less consumption and investment and higher saving—will mean central banks face a further reduction in the already limited space they have to stimulate growth.

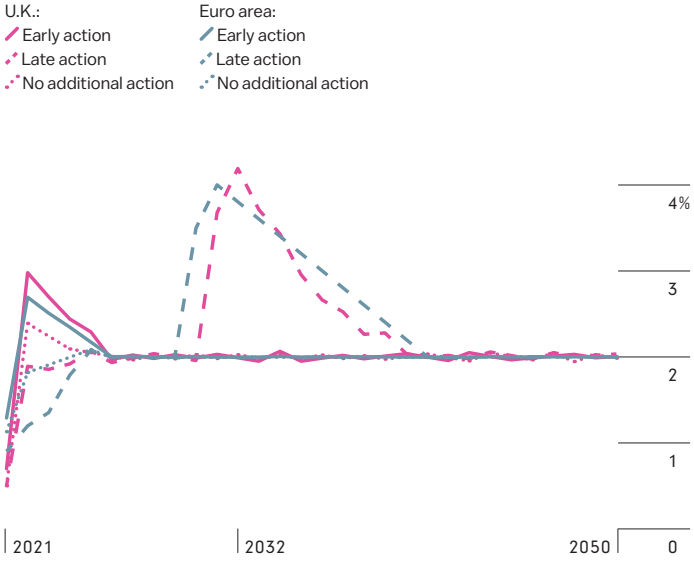
A New Oil Price Shock

The increase in carbon prices required to spur the world toward net-zero emissions is expected to push up average prices across the economy. The more suddenly carbon costs rise, the greater the inflationary impact. The International Monetary Fund estimates that the global average emissions price is only $3 a ton and may have to rise to $75 a ton by 2030. The BOE expects much larger increases.

How will that affect inflation and the choices facing central banks? Consider the three scenarios originally identified by the Network for Greening the Financial System, a group of central banks and financial supervisors focused on addressing the challenge of climate change: ►

Delayed Action on Carbon Prices Would Mean Higher Inflation

Consumer price index, year-over-year change, by transition scenario



Sources: Bank of England; Bloomberg Economics

• In an orderly transition, the increase in carbon prices starts immediately and prices rise gradually to the level required to achieve net-zero emissions.

• A disorderly transition would delay remedial action until 2030 and then require much faster increases in carbon prices.

• Inaction—with carbon prices staying unchanged—would lead to a temperature rise exceeding 3 degrees Celsius by 2100, a catastrophic outcome.

In the orderly transition scenario, consumer price inflation in the U.K. will peak in the early 2020s around 3%, 1 percentage point higher than in the no-carbon-pricing baseline, based on estimates from the BOE. The disorderly scenario would be markedly more costly, with inflation in the early 2030s a full 2 percentage points above the baseline.

The challenge for central banks is that a supply shock would push up prices and weigh on growth. The BOE anticipates that in the disorderly adjustment scenario, not only would inflation be 2 percentage points higher, but output would contract 3% and unemployment would rise higher than in the 2008 financial crisis.

In such a situation—reminiscent of the oil price shocks that triggered stagflation in the 1970s—central banks have no easy answers. In the scenario above, the BOE focuses on containing the blow to growth and jobs, and looks through the above-target inflation—cutting interest rates. However, the ultimate impact on inflation will depend on how the trade-off between inflation and output stabilization is treated—some central banks are likely to be more tolerant of rising prices than others.

Volatile Weather and Inflation

Higher carbon prices aren't the only way in which climate change will affect inflation dynamics. Extreme weather events threaten to wreak havoc at more frequent intervals. Higher temperatures weaken growth.

The impact of more frequent and more extreme weather events on inflation is ambiguous. Studies by European Central Bank economists Donata Faccia and Miles Parker conclude that, because of the blow to supply, the immediate effects of extreme events are likely to be inflationary. That's particularly the case for developing economies, where food makes up a larger share of the consumption basket and inflation expectations are less well anchored. Over time, though, it's the demand shock that tends to dominate, leading to lower inflation.

Think about it like this: If a hurricane takes out a crucial piece of transportation infrastructure, like a port, the immediate impact is less goods getting to market—a blow to supply that means higher inflation. Looking further forward, though, with the owner of the port having had to pay for its reconstruction, the company will have less to spend on new projects, so it's demand that suffers relatively more. Using stochastic simulations of the effect of random extreme events on the economy, the ECB estimates that more frequent major disasters could send inflation markedly below its target.

Climate change also has a negative impact on long-term growth potential. Extreme heat will reduce the number of workers and weigh on labor productivity. Investment will be diverted to unproductive uses like upgrading flood defenses. Some physical capital will also become obsolete as sea levels rise and parts of the world become unsuited for production, especially in agriculture. With lower contributions from capital and labor, a hotter planet will mean a slowdown in growth.

For central banks, that creates an additional problem. The natural rate of interest, which balances overall investment and savings, declines, as slower and more volatile growth lowers the incentive to invest (as future returns on capital are expected to be lower and riskier) and increases precautionary savings. Given that stimulating the economy requires cutting the policy rate below the natural rate, that means central banks—many of which are already stuck at the zero lower bound—will have even less room for maneuver. ●

The Years Ahead

Productivity after the pandemic, the BRICs and the BEASTs, Africa's poverty goals, China's "common prosperity," and how geopolitics and carbon prices will reshape trade.

Does Talk of a Covid Dividend Make Any Sense at All?

By STEPHANIE FLANDERS

RECESSIONS DO PERMANENT DAMAGE to the economy: That's the lesson of history. But looking at how quickly governments and businesses responded to the Covid-19 shock has left some wondering whether this time might be different.

It's a tantalizing thought, and in many countries it does look as though the pandemic has done less long-term damage to the economy than initially feared. But hopes of a "pandemic dividend" for productivity or investment in the U.S. seem optimistic—especially if supply disruptions turn out to be prolonged. What is clear is that Covid has deepened preexisting inequalities, within countries and between them. Policymakers seem to be well behind the curve in thinking through how to respond.

Dan Hanson and Yelena Shulyatyeva examined 36 recessions since 1965 for Bloomberg Economics and found that 90% of the time, economies that suffer a downturn never get back to their pre-crisis path. The average hit was 4.7% of gross domestic product, with deeper recessions typically producing more long-term damage.

In the thick of the pandemic, this historical record didn't bode well. Economic lockdowns had produced double-digit declines in output in many economies by the middle of 2020 and an historic 3.3% decline in global GDP for the year as a whole. (For reference, global output barely fell at all in the 2008 financial crisis.)

There were, however, some distinctive features of the pandemic that led to hope that the outcome might be much brighter. Notably, the financial sector wasn't caught up in the crisis or making it any worse. Even more important, governments stepped in almost immediately to "fill the hole" in GDP left by lockdowns. In the case of the U.S., household incomes actually rose in 2020, despite an historic decline in U.S. output in the first half of the year.

Globally the International Monetary Fund puts the long-term damage at about 3% of global GDP. That's a palpable hit, but as the IMF points out, the global financial crisis of 2008-09 left a much larger hole of close to 10% of global GDP. The headline 3% number also hides enormous variation.

For the U.S., the speed and continued scale of the fiscal supports have seemingly prevented any long-term harm to GDP, an astonishing outcome. Bloomberg Economics expects the U.S. economy to be back on its 2010-19 trend line by 2023.

Others haven't been quite so fortunate, but as Ziad Daoud and Scott Johnson point out, emerging-market economies returned to their pre-Covid level of output by the end of the first quarter of 2021. That's a turnaround of 7.6 percentage points of GDP in barely nine months. On average, the IMF estimates that the long-term cost of Covid for emerging-market economies will also be about 3% of GDP. But for lower-income countries that didn't have ready access to vaccines or fiscal capacity to support the economy, Covid could bring more long-term harm than the recession of 2008-09.

That's the big picture on the crisis. At the micro level we know the pandemic also kick-started a revolution in work practices and greatly accelerated the use of technology and automation in many advanced economies.

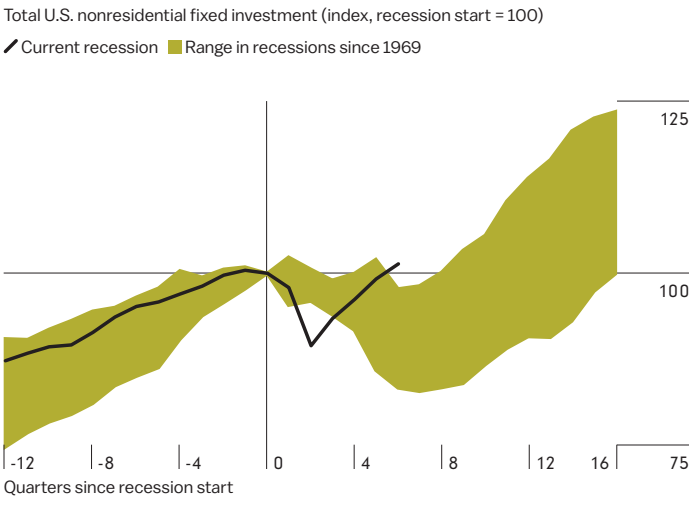
At the peak of the initial U.S. lockdown the equivalent of almost two-thirds of the country's GDP was being generated by people working from home, and many retailers went from having no online presence to selling almost as much as before the pandemic, entirely online—in a matter of weeks.

Some think this holds out the possibility of not just minimizing the permanent hit to GDP, but actually coming out the other side with a faster rate of potential growth. The McKinsey Global Institute, for example, reckons that the faster automation and change in work practices could raise productivity growth in the U.S. and Western Europe by about 1 percentage point annually in the years to 2024, double the pre-crisis average.

That would be an extraordinary outcome. Can it really be true that some advanced economies will grow faster as a result of Covid?

Going back to basics, it's the growth rate of core inputs—labor and capital—and the efficiency with which they're used that drives the long-term potential growth rate of an economy.

U.S. Business Investment Has Rebounded Faster This Time



Source: Bloomberg Economics

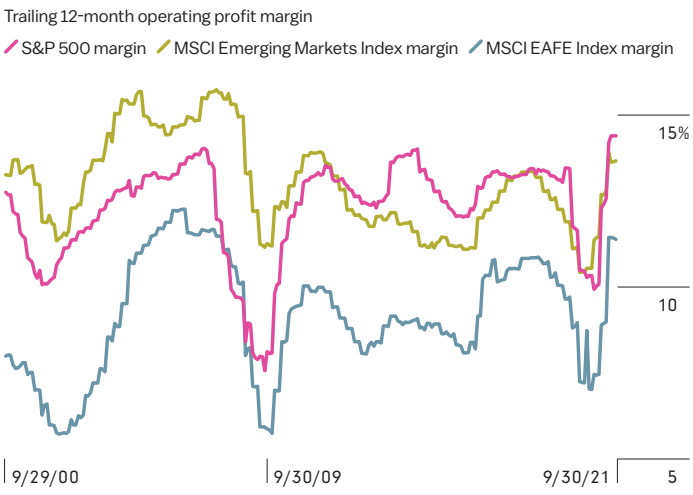
Recessions don't change the growth rate of the population, and neither has Covid in any significant way. But workers being made unemployed will damage a country's human capital, especially if unemployed workers take time to find new work, end up in lower-quality jobs, or leave the workforce altogether.

When output is falling, businesses tend to cut back on capital investment and innovation. Economies get back to their previous level of output, but the forgone investment and innovation is never entirely made up, meaning the economy is on a permanently lower path.

The path of investment definitely was different this recession. Business investment has recovered more quickly than after any U.S. downturn going back to the 1960s (page 26). The bounce was even greater for equipment investment—no doubt partly thanks to that jump in automation and a revolution in working practices. Data from the Robotic Industries Association show spending on robots was 64% higher in North America in the fourth quarter of 2020 than a year earlier.

If investment stays on a higher growth path in 2022 and beyond, that could produce a positive Covid dividend, other things equal. And businesses in the U.S. and the euro zone certainly have money to spend after a year of stunning growth in profitability and returns (below).

Pandemic Profitability



Source: Bloomberg Economics

Alas, it's far too early to say whether that kind of boom is taking place. Although the advanced economies as a group have seen investment bounce back much faster than in 2008-09, the total amount is still below the pre-crisis trend. Also, there's been plenty of cash sitting on corporate balance sheets in other recent periods without it translating to significant growth in investment. Quite the opposite.

Business investment has tended to fall as a share of GDP in advanced economies in recent decades. We have mostly attributed that slowdown to long-term structural factors, including the declining cost of investment goods and the aging of the population. Covid hasn't done anything to change those.

Most important, other things are *not* equal. Even if investment and productivity are booming in parts of the economy, that isn't the story for the whole economy or the wider world. The limited diffusion of innovation from companies at the cutting edge to the wider economy has been a significant factor holding back productivity growth in Europe and the U.S. in recent decades. There's no evidence yet that innovations triggered by the pandemic are going to be more broadly shared.

Looking at recent severe labor and supply shortages in the U.S. and elsewhere, it's clear that along with the innovation and higher profits we've seen productivity-reducing dislocations and adjustment costs.

We also know that what's life- and productivity-enhancing for the roughly half of the workforce that was working from home through the pandemic could have the opposite impact on workers in high-contact sectors who were the first to lose their jobs when economies were shut down. As a recent academic paper points out, high-skill service workers in the U.S. may now have more flexibility in deciding where to live, but that in turn endangers the livelihood of low-skill service workers in big cities who depend on local consumer demand.

The unequal distribution of gains and losses within countries will be mirrored, if we're not careful, by divergence at the global level—as countries not well placed to weather the changes in the global economy slip further behind the rest.

Bottom line: Covid-19 is going to do less permanent damage to the size of the global economy than initially feared and, by disrupting old ways of doing things, may well have boosted productivity and innovation in key sectors. That's good news. But these same forces are also threatening to make wealth and income inequalities even more entrenched. There was a lot of talk, in the thick of the crisis, about promoting inclusive growth and a "reset for workers." Looking at the rather bumpy recovery we're seeing around the world, it's far from clear that governments know how to make that happen. ●

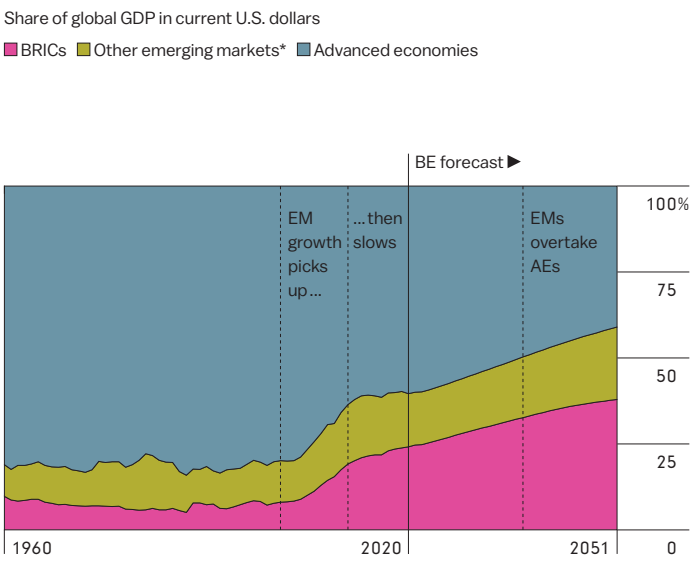
From the BRICs to the BEASTs: The Outlook for Emerging Markets

By ZIAD DAOUD and SCOTT JOHNSON

TWENTY YEARS AGO, GOLDMAN SACHS economist Jim O'Neill predicted that emerging markets, led by the BRICs, would play a much larger role in the global economy. He was right. Since 2013, though, the focus has shifted from growth to risks. We see the BEASTs—Brazil, Egypt, Argentina, South Africa, and Turkey—as the most exposed.

- Emerging markets did take off after 2001, as O'Neill forecast. Their share of global gross domestic product rose to almost 37% in 2011, from 20% in 2000.
- In the last 10 years, with slipping governance, challenging geopolitics, and slowing growth, the focus in many emerging markets has shifted from the opportunities to the risks.
- Looking ahead, emerging markets will continue to claim a larger share of global output while defying easy characterization as either growth darlings or crisis-prone basket cases.
- The BEASTs look especially vulnerable given their combination of lower foreign exchange reserves, weaker current-account balances, and higher external debt. Conversely, with stronger fundamentals and robust growth prospects, many Asian emerging markets are still poised for outperformance.
- For policymakers, executives, and investors attempting to navigate a complex space, differences between emerging markets in geography and over time will be more important than commonalities.

Emerging Markets Driving Global Growth



*Non-BRIC markets designated "Emerging and Developing" by the International Monetary Fund.
Sources: World Bank; Penn World Tables; IMF; Bloomberg Economics

The BRICs

Writing in late 2001, O'Neill predicted that emerging markets would outpace advanced economies over the following decade. He expected China to lead the way, but he also thought Brazil, Russia, and India would grow faster than the Group of Seven advanced economies.

Running the numbers, the BRICs performed even better than O'Neill had predicted, doubling their share of the global economy to 19% in 2011, from 8% in 2000. That success had political and financial ramifications. From climate change to global security, China is now a central figure at the negotiating table. The leaders of the four countries plus South Africa hold an annual summit. And the number of BRIC-focused investment funds soared in the 2000s.

The BRICs were the vanguard, but growth took off in other emerging markets, too. Altogether their share of the global economy rose to about 37% in 2011, from 20% in 2000.

Why Did Emerging Markets Take Off in 2001-11?

Four forces—booming trade, rising commodity prices, improved governance, and a stable macroeconomic environment—combined to turbocharge emerging markets' growth. The last of these marked a stark contrast with the prior two decades, which saw major financial crises in Latin America (1980s), Mexico (1994), Asia (1997), and Russia (1998), to name just a few.

Crisis episodes became less frequent in the 2000s as inflation fell, public debt declined, external debt dropped, foreign exchange reserves rose, and current-account balances improved. Emerging markets survived the Federal Reserve's tightening cycle of the mid-2000s largely unscathed. In the absence of major financing shocks, tailwinds from stronger global demand, commodity windfalls, and pro-growth policies provided momentum.

From Growth to Risks

In the 2010s, with growth slowing and risks rising, the story changed. Emerging markets as a group continued to outpace advanced economies, but the gap narrowed. Some—like Russia and Brazil—trailed the advanced economy benchmark, offering investors an unenticing combination of higher risks and lower returns.

The four forces that drove growth in the 2000s turned into headwinds. Global trade slowed after the 2008 financial crisis and

as Donald Trump's U.S. presidency triggered frostier relations with China. Commodity prices slumped as the supercycle turned. External vulnerability to capital flight increased amid repeated crises.

From BRICs to BEASTs

Emerging markets experienced multiple crises after 2011 including:

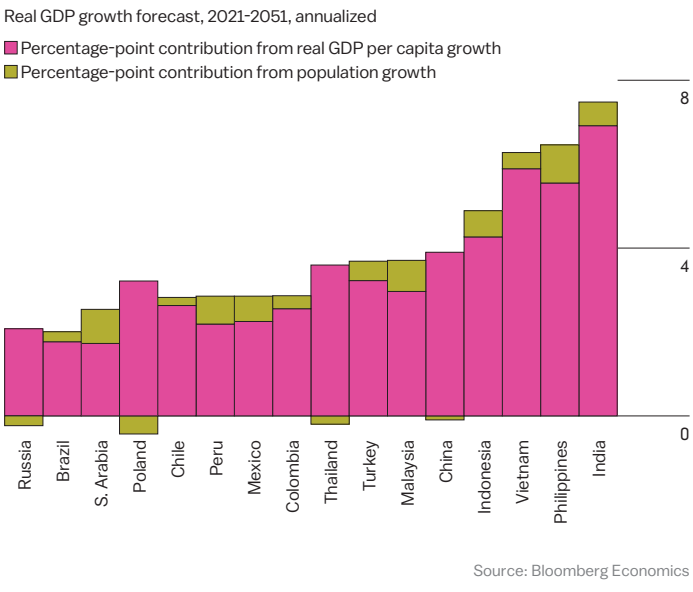
• The 2013 taper tantrum: Expectations that the Fed would scale back its asset purchases prompted a sudden outflow of capital from emerging markets. Brazil, India, Indonesia, South Africa, and Turkey were most exposed. Their central banks hiked rates to stem the plunge in their currencies.

• The 2015 equity crash in China: Even the biggest emerging economy experienced its own scare. Its stock market tumbled 43%, the yuan slid as capital outflows intensified, and foreign exchange reserves declined at an unnerving pace.

• The 2018 currency crisis: Rising U.S. interest rates combined with clumsy policy to trigger this episode. Argentina and Turkey were at the forefront—their currencies plunged 50% and 25%, respectively, against the dollar. There was contagion to other markets, including Russia, Brazil, and South Africa.

• Today, as the Fed ponders withdrawing its substantial Covid-related stimulus, some emerging markets are again vulnerable. Brazil, Egypt, Argentina, South Africa, and Turkey—the BEASTs—are most exposed with their lower reserves, weaker current-account balances, and higher external debt. At the other end of the spectrum, China, Russia, and much of Southeast Asia are on a more stable footing.

Where's the Growth? Mostly in Asia



Source: Bloomberg Economics

What Lies Ahead

Will the coming decades look like the 2000s or the 2010s? Probably somewhere in between.

Emerging markets are likely to keep outpacing advanced economies. Based on Bloomberg Economics' forecasts, average annual growth will be around 4.2% in the next three decades, compared with 1.6% in the developed world. As a result, the share of emerging markets in the global economy will surpass that of advanced economies by 2040.

The weight of the global economy will shift to Asia. Our baseline scenario shows China overtaking the U.S. to become the world's largest economy around the mid-2030s. India will leap to third place in the global league table. Indonesia looks set to outperform—outstripping Russia and Brazil. The Philippines and Vietnam will post some of the fastest growth rates.

Elsewhere, the picture is less positive. In much of Latin America and Africa, and for Russia and its neighbors, a combination of demographic drag, reform failure, and external vulnerabilities means outperforming will be tough to do. Even as the share of global GDP from Asia is poised to move higher, the share from emerging markets elsewhere is likely to stay about the same.

And there are risks to the outlook. Governance is slipping—China's crackdown on the private sector, Recep Tayyip Erdogan's rising authoritarianism in Turkey, and Vladimir Putin's growing repression of dissent in Russia are a few examples. The threat of crises has increased with the pandemic pushing public debt to a record high. And climate change poses a risk to the survival of the planet, but emerging markets face the highest potential costs.

Emerging markets will remain the growth engine of the global economy. With an expanding population, they have a demographic advantage over advanced economies. And from a still-low starting point, they have space to grow simply by adopting technologies already in use in more advanced economies.

Within that overall positive narrative, though, differences between economies will be more important than commonalities. The new reality in the decades ahead will be an emerging-market space that's more and more important, even as it's harder and harder to define. ●

Half a Billion in Poverty and Counting: How Covid Derailed Africa's Development Goals

By BOINGOTLO GASEALAHWE and ADRIANA DUPITA

THE COVID-19 PANDEMIC HAS PUSHED an estimated 30 million people in sub-Saharan Africa into extreme poverty, wiping out more than five years of progress. Some of the lost ground will be made up, but not enough to meet the United Nations' Sustainable Development Goal of eradicating poverty by 2030—a target that was already a stretch before the pandemic hit.

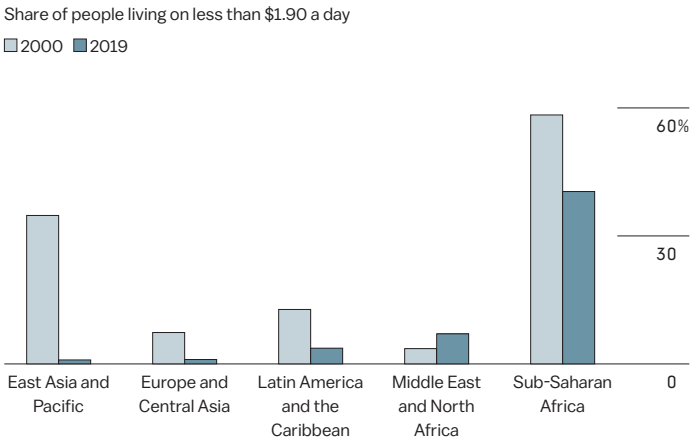
• Sub-Saharan Africa has had a steady growth run for most of the past two decades, enabling many countries to make inroads in the fight against poverty. Accelerating growth has helped Africa as a whole advance toward achieving the UN's Sustainable Development Goals. Still, progress was slow and lagged the rest of the world.

• The pandemic has widened this gap, making it unlikely sub-Saharan Africa will eradicate poverty by 2030. Bloomberg Economics' forecasts suggest the continent will still have an estimated 500 million people on subsistence living in 2030. That's 25 million more than our pre-pandemic projections.

• Outperforming relative to those projections will require an extraordinary effort from the international community, given the region's limited resources.

• China, now the region's main economic partner and building stronger ties through the "Belt and Road" initiative, will be a critical player. More trade and investment promise to accelerate growth, but financing risks saddling the region with unsustainable debts.

Africa Still Lagging in Fight Against Poverty



Source: World Bank PovcalNet

Pre-Covid Progress

After many years of decline, the turn of the century marked a turning point for Africa's economy, which accelerated upward. Gross domestic product per capita rose an average 2.5% per year through 2015, save for a temporary interruption during the financial crisis. That's up from an average annual decline of 1% in the preceding two decades. Growth was broad based, with most countries recording significantly higher per capita GDP levels in 2015 than in 2000—a 40% improvement on average.

What explains this turnaround? Conflicts subsided, allowing for better economic policies and increased macroeconomic stability. The International Monetary Fund and World Bank's Heavily Indebted Poor Country Initiative in the early 2000s led to substantial reduction in debt levels, freeing up domestic resources and improving donor relations. Increased trade and buoyant commodity prices also played a role, with GDP per capita in resource-rich countries growing twice as fast.

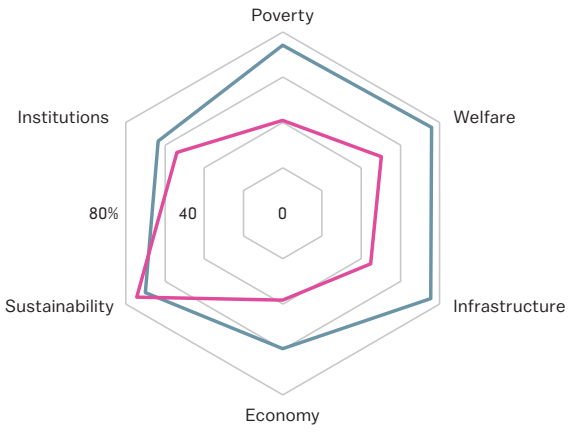
A bigger economic pie translated into better living standards—people became healthier, access to basic services such as water and sanitation improved, school enrollment increased, and the share of people living below the World Bank's extreme poverty line of $1.90 per day fell from 58% in 2000 to 42% by 2015.

Since 2016, however, growth has faltered, reflecting several factors. Waning global growth, falling commodity prices, and rising protectionism all combined to damp the region's exports, with

Still Behind on Most Sustainable Development Goals

Composite scores on UN Sustainable Development Goals categories

Sub-Saharan Africa World average (excluding sub-Saharan Africa)



Goal scores have been grouped into composites. Poverty: "No poverty" and "Zero hunger." Welfare: "Good health and well-being," "Quality education," and "Gender equality." Infrastructure: "Clean water and sanitation" and "Affordable and clean energy." Economy: "Decent work and economic growth," "Industry, innovation, and infrastructure," and "Reduced inequalities." Sustainability: "Sustainable cities and communities," "Responsible consumption and production," "Climate action," "Life below water," and "Life on land." Institutions: "Peace, justice, and strong institutions" and "Partnerships for the Goals."
Sources: United Nations Sustainable Development Goals 2021 report; Bloomberg Economics

resource-rich countries experiencing the biggest drop in GDP growth. Rising borrowing costs, episodes of sudden capital outflows, and adverse climate shocks such as the seven-year-long drought that rocked South Africa from 2013 also took a toll.

The slowdown started a year after the adoption of the Sustainable Development Goals—the universal call to eradicate poverty by 2030 through progress on 17 integrated goals that range from health, education, and inequality to action on climate change.

Sub-Saharan Africa continues to lag behind on most of the goals, as the chart to the left shows. The exception is climate action, where the region has outperformed the world, though not for positive reasons: Low growth has meant less carbon emissions. The most striking miss is on poverty reduction. In 2019, before the pandemic hit, the region was home to more than 60% of the world's 700 million poor.

Pandemic Throws Africa Further Off Track

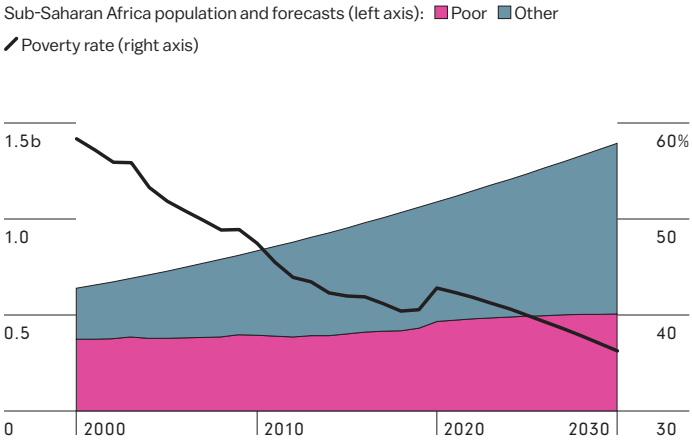
The Covid-19 pandemic is a setback that threatens to throw the region further off its stride. In 2020, sub-Saharan Africa plunged into its first recession in more than 25 years, erasing at least five years of progress in fighting poverty.

That lost ground won't be recovered until 2024, when we expect per capita output to return to pre-pandemic levels. Sluggish vaccine rollout means many countries will continue to deal with virus outbreaks that delay the safe reopening of their economies. Rising debt service costs will continue to squeeze out much-needed development spending even when the virus effects fade.

What will happen to the poverty-reduction goal? Using the historical relationship between poverty rates and their main driver, real GDP per capita, and our own growth projections, we find the rate is set to fall in the 2020s, but at a slower pace than in the previous two decades. We expect the share of the population living in poverty to decline by 6.5 percentage points in the 2020s, compared with 7 percentage points in the 2010s and 9.5 percentage points in the decade prior. The slower rate of poverty eradication means the continent will still have 500 million people on subsistence living in 2030.

The pandemic is to blame. Its persistent effect on incomes means the poverty rate will end the decade 2 percentage points higher than would have been the case had the coronavirus outbreak never occurred. That translates into almost 25 million more people living in poverty, compared with pre-Covid estimates. ►

Poverty Still Declining, But Progress Set to Slow



Sources: World Bank PovcalNet; United Nations; Bloomberg Economics

China a Growth Driver, and Debt Risk

The goal of eradicating extreme poverty by 2030 remains clearly out of reach for much of sub-Saharan Africa. A more realistic goal may be to halve extreme poverty from its current level by 2030, but this will still require an extraordinary effort from the international community given the region's limited resources. To whom should it look?

Official creditors, including the IMF, still account for the largest share of external debt in low-income countries—the majority of which are in sub-Saharan Africa. However, there has been a marked shift in the composition of lending within the Group of 20. China is now the largest creditor, and has seen its share of debt owed rise from about 40% in 2010 to more than 63% at the end of 2019. The West's share meanwhile, has halved.

Trade patterns tell a similar story. China's share of overall goods trade with sub-Saharan Africa has increased fivefold, from 4% in 2000 to 20% in 2019—displacing the West as the region's main economic partner.

Beijing is now looking to deepen its ties with the region through the Belt and Road initiative, a plan to advance development priorities by investing in infrastructure projects around the world. More than half of the 60-plus recipient countries are in Africa, increasing incentives for China to play a bigger role in the sub-Saharan area's fight against poverty.

Done right, increased engagement with China promises to build needed infrastructure and open new routes to trade, helping deliver on Africa's poverty reduction goals. Done wrong, it threatens to add to debt and stymie the development of a native manufacturing industry, adding to the region's many other challenges. ●

No Workers, No Taxes, No Rivals: The Rise of Megafirms

By JUSTIN JIMENEZ

A TRAWL OF 30 YEARS OF MARKET and company data shows that the world's biggest firms are doing great, but that might not be such good news for everybody else.

• The big have gotten bigger, techier, and more Chinese. In 1990 total profit for the world's 50 largest companies was only $68 billion (0.3% of global gross domestic product). By 2020 it had risen to $788 billion (almost 1% of GDP).

• In the same period, the number of tech companies in the top 50 rose from three to 21, and the number of Chinese companies from zero to eight. For all the nervousness in Washington, China's rise has come almost entirely at the expense of a shrinking share of European companies.

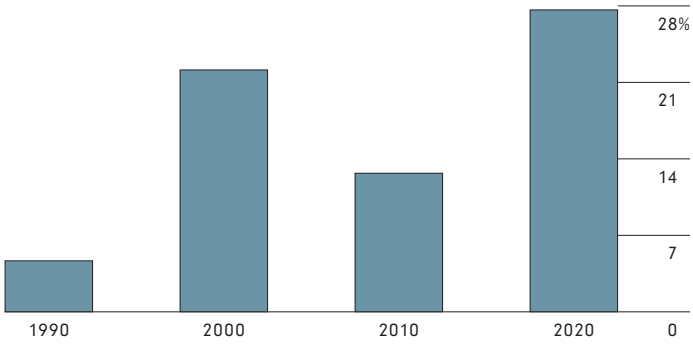
• Increasing corporate power has contributed to falling tax payments and—not unrelated—rising profitability. In 1990 the median effective tax rate for the top 50 was 35%. By 2020 it had fallen to 17%. Over the same period, the median profit margin rose from 7% to 18%.

• On competition, there's a complex picture. Tech giants are both dominant in their market position and innovative disrupters of inefficient rivals. For policymakers there's a tension between nurturing competition at home and supporting national champions abroad.

• All of that points to some important takeaways. For competition authorities, it underscores both the urgency and the complexity of grappling with the megafirm challenge. For tax authorities, it highlights the importance of moving to close loopholes.

The Big Get Bigger

Market cap of world's 50 largest companies as a share of global GDP



Source: Bloomberg Economics

The Big Get Bigger, Techier, More Chinese

The big are getting bigger. In 1990 the top 50 publicly listed companies in the world booked profits of $68 billion, equivalent to 0.3% of nominal global GDP. In 2020 that number had risen to $788 billion, almost 1% of global GDP. One reason their profits aren't even bigger: Expansionist ambitions see many giant firms sacrificing short-term income for gains in market share that will deliver even larger payoffs in the years ahead.

Investors appear to believe that strategy will pay dividends. As the chart above shows, the market capitalization of the world's top 50 firms is now equivalent to almost 28% of global GDP.

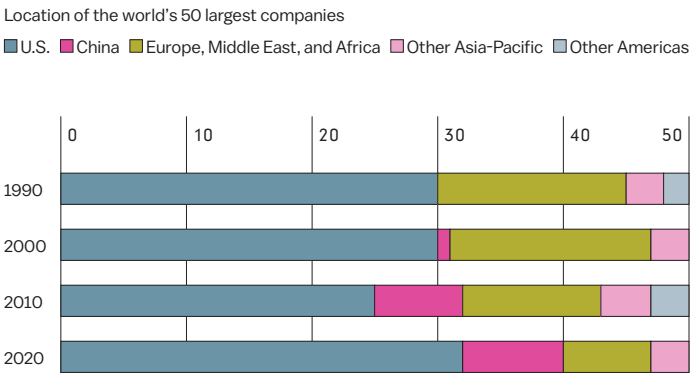
No surprises: The composition of the top 50 reflects the rise of the tech titans. In 1990 there were only three tech companies on the list—IBM, Japan's NEC, and France's Alcatel. By 2020 there were 21, including eight of the top 10.

No surprises also that the balance of corporate power is beginning to move from west to east. In 1990 there were no Chinese companies in the top 50. In 2020 there were eight. On the whole, China's rise has come at the expense of a shrinking share for Europe, which has seen its representation in the top 50 fall from 15 to seven over the same period.

More Profits, Less Taxes

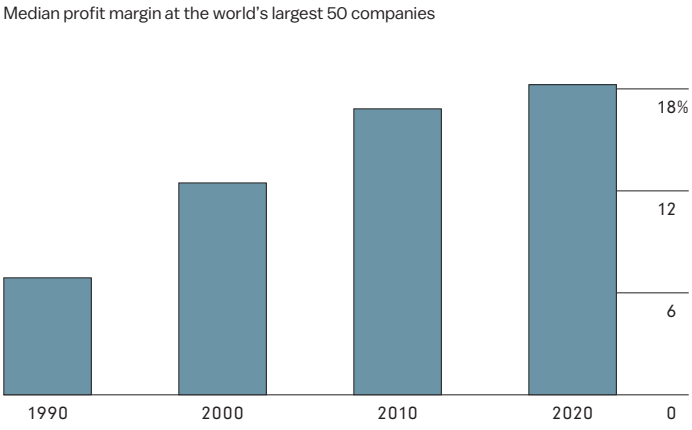
Credit where credit is due: In large part the rise of megafirms reflects the mega-appeal of their products and services. Who now can imagine searching for information without Google? Living through a pandemic without deliveries from Amazon.com or—in China—Alibaba? Staying connected without a smartphone from Apple or one of its many imitators? ►

Regional Breakdown of World's Top 50 Firms



Source: Bloomberg Economics

Profits at the World's Top 50 Firms



Source: Bloomberg Economics

At the same time, the rise of corporate giants brings costs as well as benefits.

Increased size brings with it increased market power: the ability to stifle competitors, squeeze suppliers, milk customers, and shape regulation. All of that shows up in higher profit margins. In 1990 the median profit margin for the top 50 listed companies was 7%. By 2020 it had more than doubled to above 18%.

Another expression of the rising power of corporate giants—and a contributor to rising profit margins—is a greater ability to resist the call of the taxman. Reflecting the combined impact of lower tax rates and ruthless tax optimization strategies, the median effective tax rate for the world's biggest firms has halved, dropping from 35% in 1990 to 17% in 2020.

Less Capex and Workers ...

In 1990, with industrial giants such as General Electric and Exxon Mobil looming large, capital expenditure was a critical part of the corporate landscape. In 2021, with tech titans muscling their way to the top of the rankings, output is more likely to be expanded by adding capacity in the cloud than by building more factories. In 1990 median capex for the world's top 50 listed companies was 7.4% of revenue. By 2020 it had fallen to 4.9%.

The rise of corporate giants has also depressed wages for workers. Alphabet, Facebook, and other companies have models that scale with limited additional workers. Others, such as Amazon or its Chinese counterpart Alibaba, employ massive numbers of workers—Amazon counts 1.3 million—but many in low-skill, low-wage jobs. The same market power that allows megafirms to squeeze rivals and customers also allows them to squeeze workers.

... And More Cash Rich

More profits, less capital spending, and smaller wage bills mean the biggest companies in the world are also sitting on a swelling stash of cash. In 1990 cash and cash equivalents for the top 50 listed firms was equal to only $62 billion, or 0.3% of global GDP. By 2020 it had risen to $1.8 trillion, or 2.2% of GDP.

Dilemma of Dominant Companies

On competition, the data present a complex picture. On the one hand, it's clear that competition has been eroded. The market share of the top five companies in many sectors is at an elevated level. On the other hand, many of the firms that have grabbed a larger share of the market are also forces for creative destruction, introducing new technologies and business models and adding value for consumers.

Shifting from a national to a global view also changes the picture. Firms that have a dominant position in home markets are often engaged in fierce competition overseas. Amazon may have captured 55% of the U.S. retailing sector's market cap in 2020. But that figure halves to 27% of retail's global market cap—with Jeff Bezos competing with the likes of China's Alibaba.

In a world where the U.S. and China are fighting for economic supremacy, that consideration might trump fears about uncompetitive markets.

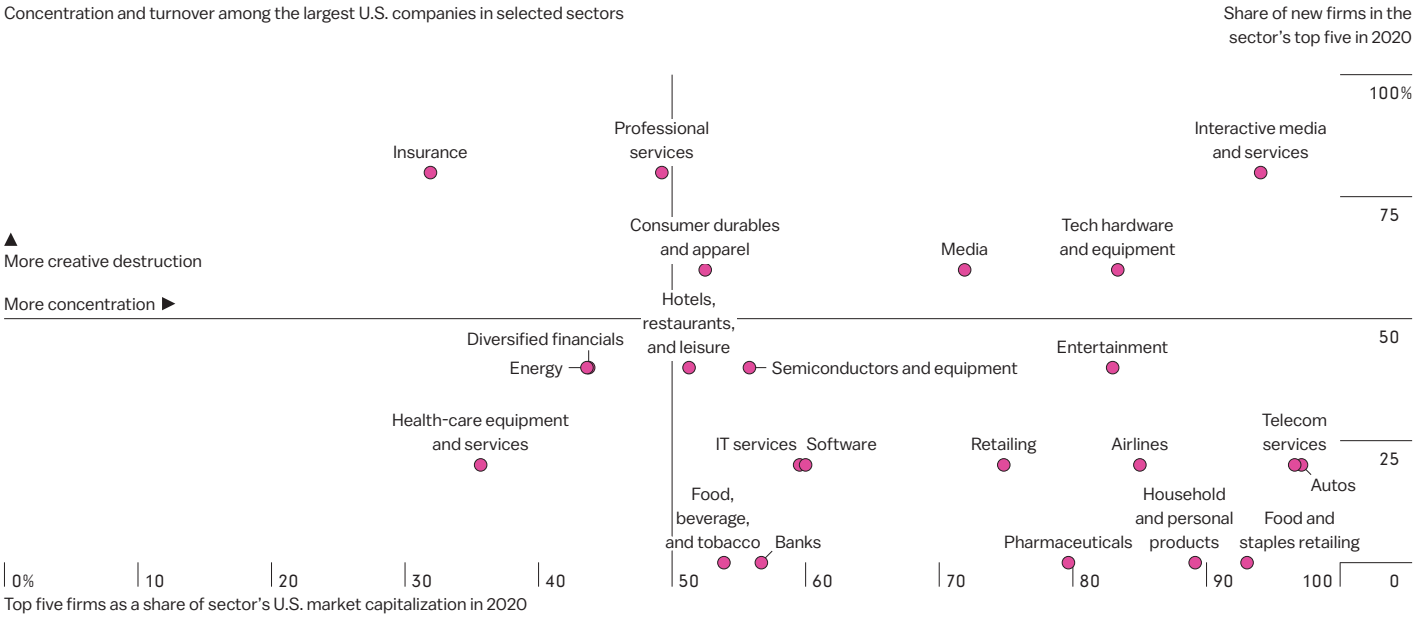
Not Your Textbook Firm

In economics textbooks, firms operate in competitive markets, hire workers, invest in expanding their capital stock, pay taxes, and borrow money. For many of the world's biggest companies, that textbook picture no longer captures the reality.

In many cases, the biggest firms exercise considerable ►

Creative Destruction vs. Industry Concentration

Concentration and turnover among the largest U.S. companies in selected sectors



Source: Bloomberg Economics

market power, have business models that can scale with limited addition of workers and capital, pay an ever-shrinking share of income as taxes, and sit on enough cash to mean that borrowing is a choice rather than a necessity.

All of that has far-reaching implications for our understanding of how the economy operates and how economic policy should be set, many of them captured in the burgeoning literature on secular stagnation and superstar firms.

For policy, the clearest takeaways are for tax collectors and antitrust regulators. For monetary and fiscal policy, the rise of superstar companies suggests that the conventional channels for demand management will be of diminished effectiveness:

• The supply-side argument that cutting taxes will spur growth by driving hiring and investment—never particularly well-supported by the data—now looks increasingly tenuous. In the age of superstar firms, it seems more likely that cutting taxes will add to burgeoning piles of corporate cash without having much of a beneficial impact on the broader economy.

• Central banks will make the argument that, even if mega-firms don't need to borrow to invest, lower rates will still stoke growth as they encourage companies to shift their funds from cash into equities and other risk assets. Fair enough. Still, portfolio rebalancing is a weak and indirect channel for boosting activity. And one that comes at a price, in higher wealth inequality and more risks to financial stability.

Methodology

We used Bloomberg's EQS function to filter the equity universe for the largest companies by market capitalization for each decade from 1990 to 2020. Our screen included all primary securities that were traded as of yearend to account for firms that have since been delisted or acquired. Local currency results were converted into U.S. dollars using historical exchange rates.

To align companies' financial statements to the calendar year, we used Bloomberg Query Language (BQL) to capture financial data on a blended annual basis. Where blended annual figures were not available, we used Bloomberg consensus estimates or data for the trailing four quarters. Our classification of firms into sectors is based on the Global Industry Classification Standard (GICS) system, with adjustments made to individual companies based on their predominant product or service.

The data provide a snapshot of the start of each decade, which may not capture shifts that occurred in the interim. In addition we examined data for 2019 to assess the impact of Covid on the results for 2020 and found they were broadly consistent with longer-term trends. One calculation where Covid did make a marked difference: The ratio of cash on hand to capital expenditure jumped higher in 2020. Still, that's an exacerbation—rather than contradiction—of the longer-term trend. ●

From Deng's Markets to Xi's Babies: How 'Common Prosperity' Aims to Preserve Growth

By CHANG SHU, DAVID QU, and ERIC ZHU

IN THE 1980S, DENG XIAOPING'S pro-market reforms supercharged China's short- and medium-term growth prospects, but his one-child policy locked in a demographic drag that threatens the long term. In 2021, Xi Jinping's shift to a three-child policy, combined with a "common prosperity" agenda to lift incomes and cut costs for a squeezed middle class, aims to boost fertility and revive the long-term outlook. The big risk: By damping the animal spirits that Deng's reforms unleashed, Xi's agenda may add a short-term blow to growth in return for an uncertain payoff.

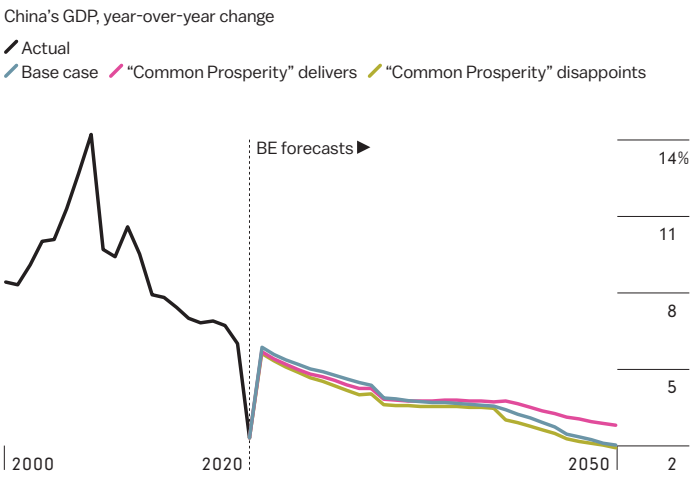
• China has a problem with inequality, with a divide between the haves and have-nots that places it among the ranks of the most unequal countries in the world. The common prosperity agenda aims to address that.

• The focus of the markets has been on regulatory clampdowns that hit major companies such as e-commerce giant Alibaba and ride-sharing app DiDi. But Xi's agenda is much broader, leveraging a range of policy tools and affecting a swath of sectors.

• Despite that ambition, there are some important drivers of inequality—notably, barriers to life in the city for rural workers and sky-high property prices—that the policy shift has yet to address.

More Babies, More Growth

China's GDP, year-over-year change



Sources: National Bureau of Statistics of China; Bloomberg Economics

• Estimating the effect of such a multifaceted and evolving program on growth is tough to do. In the short term, though, the impact may well be negative, weighing on investment and innovation.

• Looking further forward, policies that reduce the squeeze on China's middle class could boost fertility—offsetting the demographic drag that's the biggest threat to growth potential.

Inequality in China

The Gini coefficient is a measure of inequality. A country with a Gini score of 100 is perfectly unequal, with all income going to a single person. At the other end of the spectrum, a score of zero would mean income is distributed entirely equally, with everyone having an equal share. China's latest reading is just below 40—down from an even more elevated level in the early 2000s, but still high in comparison with other countries and, for a communist country, not something to be proud of.

The drivers of that inequality aren't hard to identify:

• Following Deng's famous dictum, China has allowed some areas of the country to "get rich first." In the early days, that increased social mobility. In more recent years, those born into the wealth and prosperity of an east coast metropolis such as Shanghai have a golden ticket. Those born in rural areas or less developed western provinces have a harder slog.

• The *hukou*—an antiquated system that ties access to education, health care, and other benefits to the place of birth—compounds the problem. It's not just that rural dwellers face extra costs to live in the city. Lack of access to essential services means that in many cases they face insuperable barriers.

• A decades-long property boom has accelerated the divergence. In 2002 average residents of urban Shanghai and rural Gansu province both had annual investment income of less than 100 yuan a year. By 2019 that number for those in Shanghai had risen to more than 10,000 yuan ($1,540), but for those in Gansu, it languished at 1,139 yuan ($175). The main reason: Shanghai property prices had boomed, and Gansu farm prices had not.

Some Got Rich First

Inequalities in access to essential services both reflect and exacerbate the problem. For China's richest 20%, spending on high-quality housing, education, and health care accounts for a small share of total income. For those in the bottom 20%, even ►

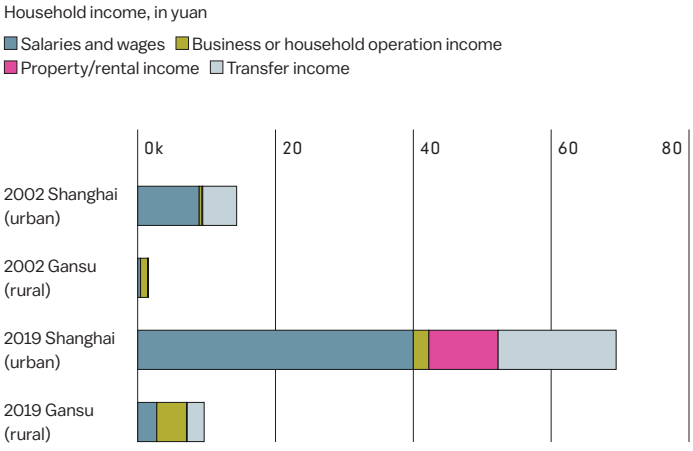
low-quality accommodation, schooling, and medical care can stretch meager resources to the limit.

The common prosperity agenda takes aim at some of those problems but not all of them.

On education, the government has targeted expensive after-school tutoring services, effectively forcing them to turn into non-profits. A squeeze on loans to property developers and speculators aims to bring runaway prices under control. And the government has launched antimonopoly investigations against big tech giants, hitting Alibaba and Tencent with substantial fines and requiring gig-economy companies such as Meituan to increase wages.

Other areas are still found wanting. The hukou system isn't nearly as restrictive as it once was. For rural residents the door to a permanent residence in second- and third-tier cities is now open. But hukou hasn't been entirely dismantled. The path to the glittering opportunities of first-tier cities like Shanghai remains closed. A property tax—seen as essential to deliver on the slogan "Homes are for living in, not for speculation"—is much discussed but not yet delivered. Public provision of education and health care in rural areas and less developed provinces remains patchy.

Urban Haves and Rural Have-Nots



Sources: National Bureau of Statistics of China; Bloomberg Economics

Slower Now, Faster Later

Whether the common prosperity agenda is effective or not, the short-term impact on growth is likely to be negative. A larger share of national income for workers and families has to mean less for entrepreneurs and investors. It's difficult to see how that policy could be delivered without damping animal spirits and weighing on investment. Uncertainty about the scope and intensity of new regulations adds to the drag. If the government does introduce a nationwide property tax, weaker real estate prices and slower construction would have a broad negative impact.

Looking further ahead, though, the impact could be positive. The crucial question: Will the government succeed in reducing the crippling cost of living that's weighed on fertility?

For years the one-child policy imposed draconian controls on family size. To the dismay of policymakers in Beijing, even after the controls were relaxed with couples now allowed to have three children, the high cost of living means many continue to opt for the one-child route. "The reason I haven't bought three Rolls-Royces is not because the government wouldn't let me," quipped one netizen in response to the news of the three-child policy. If the common prosperity agenda succeeds in bringing down costs for housing, education, and health care, and boosting incomes for the middle class, fertility might rise.

There are other potential benefits. Going back to the seminal work of John Maynard Keynes, economists have recognized that—because rich households have a higher savings rate—high inequality weighs on demand and so crimps growth. On the supply side, policies that boost access to education, and channel investment away from building real estate toward more productive projects such as developing industrial robots or a competitive semiconductor industry, could also increase potential.

Pulling the pieces together, we explore two alternative scenarios for the impact of the common prosperity agenda on China's long-term growth. In an optimistic scenario, short-term growth suffers as investment falls, especially in real estate. But in the longer term, higher fertility bolsters demand and, even further out, adds to labor supply. By the 2040s the economy would be growing at an average annual rate of 3.2%—substantially higher than the 2.6% in our base case where fertility stays low. In the pessimistic scenario, where the birthrate stays low, China suffers short-term costs from tighter regulations weighing on investment, but there are no offsetting long-term benefits. ●

Decarbonization, Deglobalization, And the Future of Trade

By MAEVA COUSIN, BJÖRN VAN ROYE, SCOTT JOHNSON, and TOM ORLIK

THE TRUMP TRADE WAR AND the Covid-19 pandemic have thrown the global trading system into disarray. There may be more trouble to come. In different ways, the fight against climate change and a deepening rift between China and the U.S. and its allies threaten to disrupt the cross-border flow of goods and services. Using a large-scale model of the global economy, Bloomberg Economics explores the main scenarios, identifying the winners and losers and putting numbers on the magnitude of the impact:

• If the world manages an orderly transition to the higher carbon prices necessary to halt global warming, disruption to trade is minimized. Still, with shifting carbon prices hitting patterns of comparative advantage, some will do better than others. The biggest losers are energy-intensive Russia and India. European countries—more advanced in their energy transition—stand to gain.

• If the U.S., Europe, and Japan move first on carbon pricing and impose a carbon border tax on other countries, the pattern of winners and losers is the same, but the magnitude of the impact is markedly higher. Russia's gross domestic product ends up almost 8% smaller than in a no-carbon-price baseline. China and India also lose out. Gains for Europe increase to more than 2% of GDP.

• If U.S.-China trade relations break down and other countries are forced to pick a side, the impact is larger still. China's GDP ends up almost 6% smaller than in the no-decoupling base case. The U.S. gains a similar amount. Mexico and India do even better, each gaining about 10% of GDP as export manufacturing shifts from China's bloc of trade partners to other low-cost countries.

Carbon Prices, Relative Prices, and Trade Flows

To achieve a rapid reduction in carbon emissions, capping an increase in temperatures below 2 degrees Celsius and preventing the worst consequences of climate change, carbon prices must be significantly increased. The Network for Greening the Financial System (NGFS), a working group of central banks, has identified the regional path for carbon prices in the years ahead that's necessary to achieve that objective.

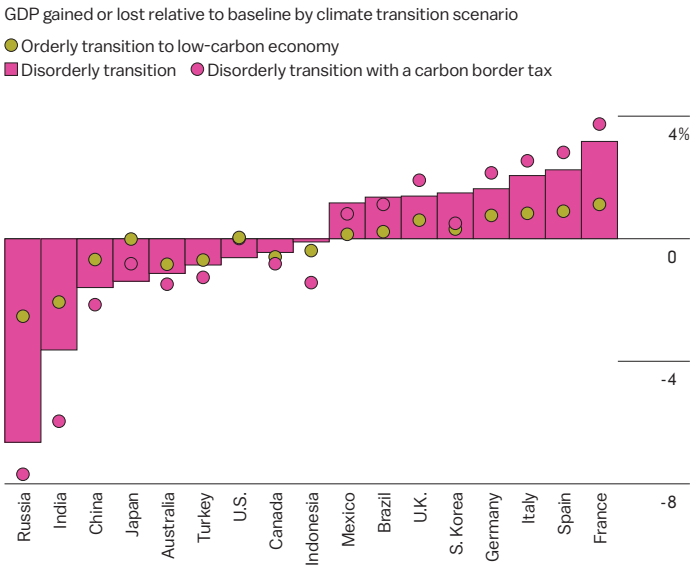
If countries take immediate, coordinated action, the NGFS estimates that carbon prices would have to increase globally to about $100 per ton by 2040 and $200 by 2050. If action is delayed until 2030, the required increase would be a lot steeper, taking the global carbon price above $300 per ton in 2040 and $600 in 2050. Under this scenario, the NGFS assumes high variation in carbon prices and emission reductions between countries. This might open a third path, with the U.S., Europe, and Japan introducing a border tax on imports to effectively impose their higher domestic prices for carbon on trade partners.

The introduction of carbon prices affects relative prices, and so changes the pattern of comparative advantage that determines global trade flows. Countries with lower carbon intensity, able to reduce emissions at a lower cost, or facing slower increases in domestic carbon prices should gain market share at the expense of competitors that are less well placed to make the transition. With its low emission intensity and ambitious emission reduction plan, nuclear-heavy France stands to do well. Russia, with its fossil-intensive production and exports of carbon-intensive goods to greener Europe, faces a much more challenging adjustment process.

Armed with estimates of the starting point for carbon prices, the carbon intensity of production, and the path for carbon prices under the orderly transition, disorderly transition, and carbon border tax scenarios, it's possible to estimate the impact on trade and GDP.

• In an orderly transition, the effect on global trade would be modest. Only a small fraction of global trade would be diverted. With carbon pricing creating new price differentials between countries, it's even possible that overall trade would increase slightly. The biggest losers: Energy-intensive Russia and India ►

Winners and Losers in a Climate Transition



Source: Bloomberg Economics

each say goodbye to about 2% of GDP. Western Europe, where there have been earlier moves to reduce emissions, would gain.

• In a disorderly transition, there would be more trade diversion, but, as in the orderly transition, the overall value of global trade would be little changed. The pattern of winners and losers is the same as with the orderly transition, but the impact is larger. Russia's GDP drops by almost 7%, India's by nearly 4%, and China's by nearly 2%. France, Spain, Italy, and Germany each see gains of about 2% of GDP.

• If the U.S., Europe, and Japan move ahead of the rest of the world with raising carbon prices, and seek to protect domestic producers from lower-price competition by imposing a carbon border tax, disruption would be more significant. The tax would add to Europe's gains and minimize U.S. and Japan losses, while reinforcing the hit to the rest of the world.

U.S.-China Tensions and Trade

With the end of the Trump administration, much of the heat has come out of U.S.-China relations. The chill that has replaced it is far from reassuring. Diplomatic ties remain strained, tariffs and technology sanctions remain in place, and the U.S. is increasingly attempting to work with allies on a coordinated strategy to respond to China's rise.

A plausible base case is that tensions continue to simmer, but with both Washington and Beijing focused more on domestic than international issues, there's no catalyst for a further deterioration. Still, the lesson of the past few years is that things can change fast, and not in a positive direction. It's worth considering what the world would look like if ties continue to splinter.

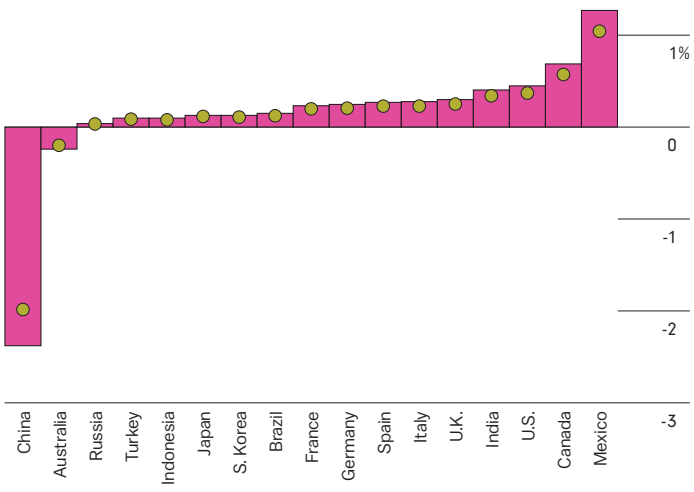
We explore three scenarios:

• A further deterioration—equivalent to the two countries imposing a 50% tariff on all bilateral trade. If that happens, China loses about 2% of GDP as exports fall. The U.S. gains about 0.4% of GDP as production returns home. Mexico and Canada do even better, with Mexico gaining about 1% of GDP as low-cost production shifts out of China and looks for a new base close to the U.S. market.

• A complete breakdown in bilateral ties—effectively turning off all U.S.-China trade. If that happens, the pattern of winners and

Winners and Losers in a U.S.-China Decoupling

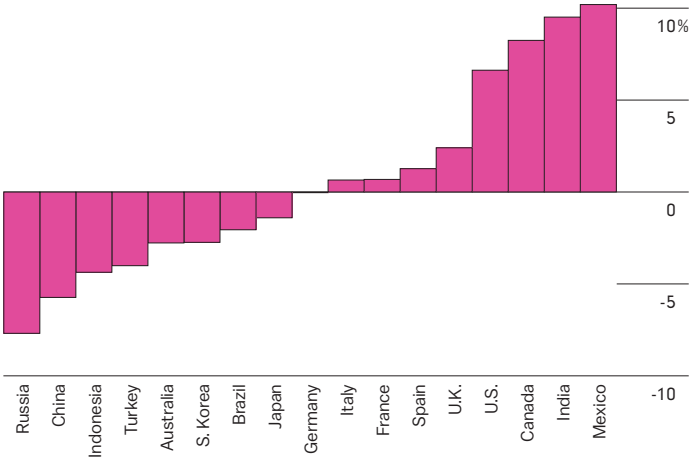
GDP gained or lost relative to baseline, by U.S.-China decoupling scenarios



Source: Bloomberg Economics

Winners and Losers as Trade Splits Into U.S. and China Blocs

GDP gained or lost relative to baseline in a U.S.-China decoupling scenario with bloc disruptions



Source: Bloomberg Economics

losers is the same, but the impacts are larger. China's losses go up to 2.4% of GDP. Gains for the U.S., Canada, and Mexico edge higher.

• A complete breakdown in U.S.-China ties, with all other countries forced to pick a side. We model this by putting all other countries into either the U.S. or China bloc, depending on where their existing trade ties are strongest, then turning off U.S.-China trade entirely and imposing a 100% tariff on all remaining trade between the two blocs. Unsurprisingly, the effects of such a scenario are extreme. Overall, 40% of existing trade flows would be destroyed. China says goodbye to about 6% of GDP, and countries in China's bloc—Asian neighbors and big commodity exporters like Brazil and Russia—also lose out. The U.S. gains about 7% of GDP. Canada, Mexico, and India do even better.

Methodology

We use the quantitative international trade model developed by Antras and Chor (2018). This model links international trade between 41 countries with 35 sectors with domestic and international input-output linkages (like in Caliendo and Parro [2015]) and iceberg trade costs for intermediate inputs and final goods. We then derive a series of shocks affecting exports of intermediate and final products from industry *i* in country *j* to country *k*.

Parameters for the Climate Scenarios

The effects of climate transition policies on trade flows will depend on how carbon prices affect relative prices between countries for each type of goods and services—depending on the baseline carbon intensity of exports, on the pace and cost of emission reductions, and on the carbon price paid on the remaining emissions.

We use the Organization for Economic Cooperation and Development's Trade in embodied CO_2 ($TECO_2$) database combined with the OECD's Trade in Value Added database to estimate the baseline carbon intensity of exports (domestic emissions per U.S. dollar of exports from industry *i* in country *j* to country *k*).

We then turn to the latest scenarios published by the Network for Greening the Financial System and consider two scenarios consistent with capping temperature increases below 2 degrees Celsius: an orderly transition ("Below 2°C") and a disorderly transition ("Delayed transition"). Under both scenarios, we use regional results covering 12 global regions from REMIND-MAgPIE 2.1-4.2 and focus on estimates for 2040.

To estimate the impact of carbon costs on prices, we consider by how much baseline carbon intensity of exports is expected to have fallen by 2040 (abatement) and the average cost of these abatements under each scenario. We assume that abatements that would have occurred under the current policy scenario (without any increase in carbon prices) do not cost anything, while additional abatements cost the average domestic carbon price in force during the year when emission reductions occurred. Finally, the share of remaining emissions is assumed to be charged at the 2040 domestic carbon price, or at the carbon price in force in the importing country under the scenario of a carbon border tax.

These estimates make the simplifying assumption that all industries and all countries are on a similar path for emission reduction within a given region—in practice, some of the industries with process emissions, such as cement production or chemicals, are likely to take longer to decarbonize, and their trade patterns may be more sensitive to carbon prices than we have estimated. The estimates also focus on carbon emissions, while other gases such as methane may also be included in climate policies, which would have a more severe impact on large exporters of agricultural products like Brazil.

In line with the NGFS, we assume that paths for carbon prices and emission reductions will differ across regions: Some of the developing economies are assumed to make rapid progress on emission reductions at a low carbon price, as they catch up technologically with the rest of the world. In contrast, more advanced economies such as the European Union or the U.S. are assumed to hike carbon prices more rapidly to achieve a faster decline toward net-zero. Divergences are particularly large in the "Delayed transition."

For each industry *i* in country *j* exporting to country *k*, each ton of carbon per dollar of export is then converted into a price of carbon by dollar of export and added to the baseline price. These costs are estimated for each country, and the ratio of those cost increases in the exporting countries relative to the importing country for each industry is used to shock relative prices used by the model.

Parameters for the Decoupling Scenarios

Under the three decoupling scenarios, we model severe trade disruptions by imposing a 50% tariff on all trade flows between the U.S. and China under the mildest scenario. We then escalate the impact by assuming that all trade between the two countries becomes virtually impossible.

In addition, we look at the implication of the world splitting into two blocs, with countries joining the bloc of their largest trade partner, either the U.S. or China (using 2019 trade data). We then assume that trade between the two blocs is severely disrupted by imposing a 100% tariff on all trade flows between countries in different blocs, while continuing to assume that all trade between the U.S. and China is impossible. ●

"We in the West, unfortunately, have an extreme bias that we think manufacturing can be moved easily because we think it's just a low-cost labor issue. But unfortunately we have zero skills at scale for manufacturing in the West. We've completely lost it."

Christian Lanng

CEO AND CO-FOUNDER, TRADESHIFT

"The economic impact of the failure to vaccinate the world could be a $9.2 trillion hit, more than half of which hits the Northern Hemisphere, and that's because of the interconnectedness of supply chains, production, and value chains, and the fact that they've been consistently disturbed, and that's playing out now with semiconductors."

John Denton

SECRETARY-GENERAL, INTERNATIONAL CHAMBER OF COMMERCE

"The reality and scope of our interconnectedness has been brought into sharper focus by the global Covid-19 crisis. Whether that interconnectedness is addressed as a dangerous liability or a transformative asset depends directly on the exercise of courageous, principled leadership in business, policy, and government."

Alexander Malaket

PRESIDENT, OPUS ADVISORY SERVICES INTERNATIONAL

"Labor costs and skills are two separate issues. I would argue that the kind of skills for modern manufacturing is an extremely critical factor for supply chains. If we begin to map out those skills, the picture that emerges is completely different than just the availability of 'hands and feet.' "

Banmali Agrawala

PRESIDENT, INFRASTRUCTURE, DEFENSE AND AEROSPACE, TATA SONS

"In the long term, dismantling international supply chains will make U.S. businesses less competitive and will blunt their global technological edge. Bringing everything onshore threatens to raise costs and reduce the appeal of U.S. products to the 95% of the world's consumers who live outside of U.S. borders."

Shannon O'Neil

SENIOR FELLOW FOR LATIN AMERICA STUDIES, COUNCIL ON FOREIGN RELATIONS

"Diversification of supply chains and the emergence of additional sourcing markets in geographies like ASEAN, Eastern Europe, and Latin America, as well as transitioning from just-in-time to just-in-case inventory models, are some of the responses to the pandemic, aimed at strengthening resiliency. These continue alongside longer-term and structural supply chain shifts that were already at play driven by several factors including technology and evolving consumer patterns."

Vinay Mendonca

MANAGING DIRECTOR AND GLOBAL HEAD OF PRODUCT, PROPOSITIONS, AND STRUCTURING, TRADE, AND RECEIVABLES FINANCE, HSBC

"Between spikes in demand, limited capacity, costly expenses, and disruptions from geopolitics, weather, and a pandemic, issues impacting supply chain logistics aren't going away anytime soon."

Amar Hanspal

CEO AND CO-FOUNDER, BRIGHT MACHINES

"One of the real advantages of having a global network is not just the economies of scale it offers businesses but also the ability to use data insights to identify systemic risks. While governments have a legitimate interest in safeguarding the privacy of their citizens, they should also consider the loss of these insights that could result from limits placed on the free flow of data across borders."

Rory MacFarquhar

SENIOR VICE PRESIDENT OF INTERNATIONAL INSTITUTIONS ENGAGEMENT, MASTERCARD

"ESG is a key consideration in commodities today, and people are certainly ensuring that commodities are produced in a way that takes care of environmental footprints, good governance, and creates sufficient social favorable impacts."

Iván Arriagada

CEO, ANTOFAGASTA

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