Bloomberg Businessweek

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A pancoronavirus vaccine might not be as far off as you think

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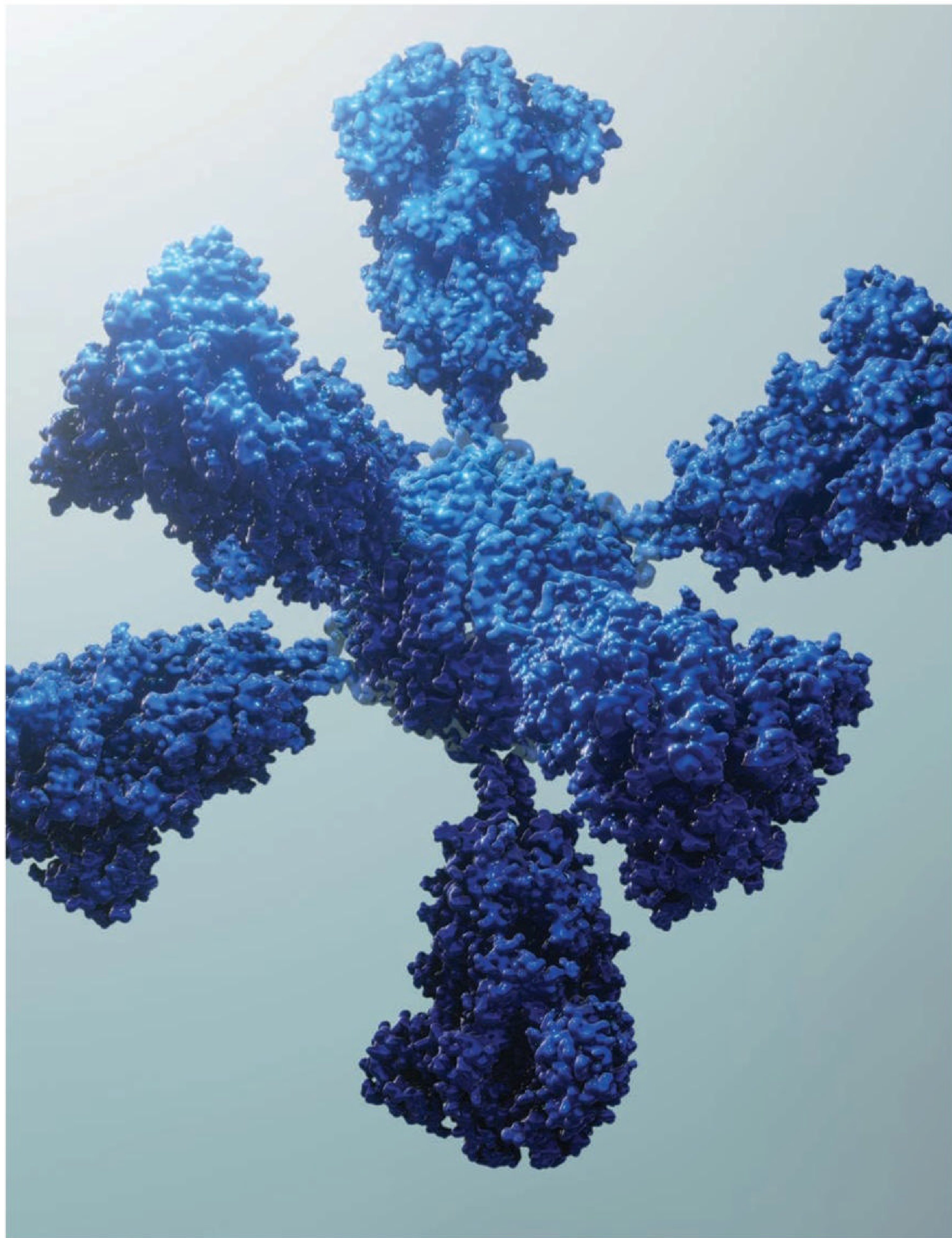

◀ A model of a spike-ferritin nanoparticle vaccine that could be used against various coronavirus strains

PAUL V. THOMAS, ARTHUR MELO, M. GORDON JOYCE, KAYVON MODJARRAD

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The hunt for a single shot to cover every coronavirus and their variants

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CORRECTION

"Goldman Sachs Bosses Want Raises" (Finance, Dec. 6) misstated the amount by which Morgan Stanley CEO James Gorman's pay for 2019 was reduced. It was 6.9%.

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■ COVER TRAIL

How the cover gets made

❶

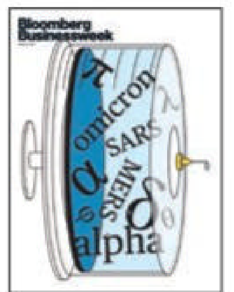
"We've got a story about a coronavirus vaccine that could cover every Covid variant—maybe even ones that cause the cold."

"Wait, what? I'm over here getting a booster—"

"That's still a good call. This one will be a while. But it's exciting, right?"

"Well, let's see if there are any thrilling ways left to show a syringe ..."

❷



"Looks like a cake stand."

"It's a sketch."

"Yeah, well, now I want cake."

"OK. But the concept is close, right? Like, the shot knows all the viruses and the Greek alphabet and all that?"

"Do Greeks make good cake?"

"Write me a cover line and we can find out."

"Piece of cake!"

"I wonder if there's a shot that prevents dad jokes."

Cover:
Photo illustration by 731; photos: Alamy (1); Getty Images (1)

ECONOMICS: JACOBIA DAHM/BLOOMBERG

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● Global coronavirus cases have topped 266 million, and almost

5.3m

people have died. Authorities around the world are imposing fresh restrictions to curb the spread of the omicron strain, closing nightclubs and schools and mandating vaccines for private-sector workers.

● The U.S. won't send officials to the Winter Olympics in Beijing, which start on Feb. 4, citing human-rights abuses. China, which denies the allegations, has threatened the U.S. with unspecified retaliation for the diplomatic boycott.

● "Things we did not do in 2014, we are prepared to do now."

U.S. National Security Adviser Jake Sullivan said President Joe Biden told Russia's Vladimir Putin that the U.S. won't stand by idly if Ukraine is invaded, a departure from the response to Russia's annexation of Crimea in 2014.

● Amazon.com's cloud-computing arm suffered an outage for several hours on Dec. 7. The disruption exposed the vulnerability of the IoT, or internet of things, as thousands in the U.S. were left without working fridges, doorbells, or video-streaming services, and drivers delivering packages couldn't download their routes.

● Nestlé raised about

$10b

selling shares in L'Oréal. The food giant, which has owned a big chunk of the cosmetics company for almost a half-century, has cut its stake only once before.

● The UAE will shift its weekend to Saturday and Sunday as of Jan. 1, aligning itself with most of the world.

Like Saudi Arabia and other nations in the Gulf, the United Arab Emirates have long had a Sunday-Thursday workweek. The new plan is intended to generate more business. Friday, a holy day in Islam, will be a half-day.

● Facebook parent Meta Platforms faces legal challenges from Rohingya refugees, with one plaintiff seeking damages of more than

$150b

Members of the Muslim minority in Myanmar blame the company for inciting genocidal violence in 2017 and failing to take action against hate speech on its platform.

● Nicaragua's army offered a helping hand to protect endangered olive ridley sea turtles laying their eggs on the country's beaches. Each turtle lays about 90 eggs, and predators—including humans—often plunder the nests.

● Sales of the top 100 arms manufacturers totaled

$531b

in 2020, according to the Stockholm International Peace Research Institute. Since 2018 the top five companies in the ranking, including No. 1 Lockheed Martin, have all been based in the U.S., which accounts for more than half of all weapons sales.

● University of Hong Kong researchers say they've developed a stainless steel that rapidly kills the coronavirus.

On contact, the alloy can inactivate 99.75% of the virus within three hours and 99.99% within six. Using the steel could significantly reduce the costs of regularly disinfecting public areas such as airports and train stations.

PUTIN: MIKHAIL METZEL/GETTY IMAGES. NICARAGUA: OSWALDO RIVAS/GETTY IMAGES

There's No Excuse For Shutting Down Schools Again

Almost two years into the pandemic, U.S. students are still suffering. Disruptions to in-person schooling have caused significant learning loss in math and reading and widened racial achievement gaps. Millions of students have a basic need: more time in the classroom.

The good news is that public-school districts have resources to make that happen, thanks to the Covid-19 relief bills passed by Congress. Yet with cases rising and the omicron variant adding to the uncertainty, some schools are once again curtailing in-person instruction. Even if limited in duration, such closures are wrong—and risk doing irreparable academic harm to the students who can least afford it.

At this point, the evidence against remote learning is overwhelming. A study released in November by the National Bureau of Economic Research compared standardized test scores from schools in districts that fully reopened early in the pandemic with those that remained at least partly virtual. While passing rates in math slumped 14.2% on average, the decline was smaller for districts where students returned to in-person instruction. Drops in reading scores were heavily concentrated in areas with large populations of minority and low-income students, which were slower to reopen.

Although students have largely returned to the classroom, the vast majority have ground to make up. Additional instruction—in the form of longer school days, summer classes, and individual tutoring—is critical for those at the greatest disadvantage. Instead, some districts, from Bellevue, Wash., to Brevard County, Fla., have done the opposite. Citing staffing shortages related to teacher exhaustion, among other excuses, schools have been adding last-minute vacation days, often with little notice to parents. Leading the mental-health relief trend, officials in Detroit announced that its schools would conduct in-person instruction only four days a week in December, with Fridays all remote.

Reducing in-person class time isn't just a disaster for students but also a betrayal of public trust. Congress has passed three separate relief packages across two administrations with funds intended to help districts stay open. Tens of billions of dollars apparently remain unspent.

Policymakers should require districts to demonstrate that they're using these funds to keep schools open. At a minimum, the practice of adding unplanned vacation days should be halted. More support for teachers may be warranted, but it shouldn't come at the expense of learning. Schools should instead expand professional development and mental-health services for teachers so more of them remain on the job. They should hire reading and math specialists to supplement classroom teachers. Reforming licensing policies to allow teachers to use their credentials across state lines could help ease any localized staffing strains.

Meanwhile, federal and state officials should better prepare schools to stay open during a possible winter surge driven by the omicron variant. On-site vaccination clinics and access to rapid tests should be expanded. School leaders should adopt "test-to-stay" strategies, which allow more students to continue in-person learning, even if classmates test positive for the virus.

The closure of schools during the pandemic has caused immense damage to U.S. students. It's also further undermined confidence in the country's public-school system, as parents with resources have turned to parochial and private options. Reversing those trends will require students to learn in person, at any cost. Ⓑ *For more commentary, go to bloomberg.com/opinion*

■ AGENDA

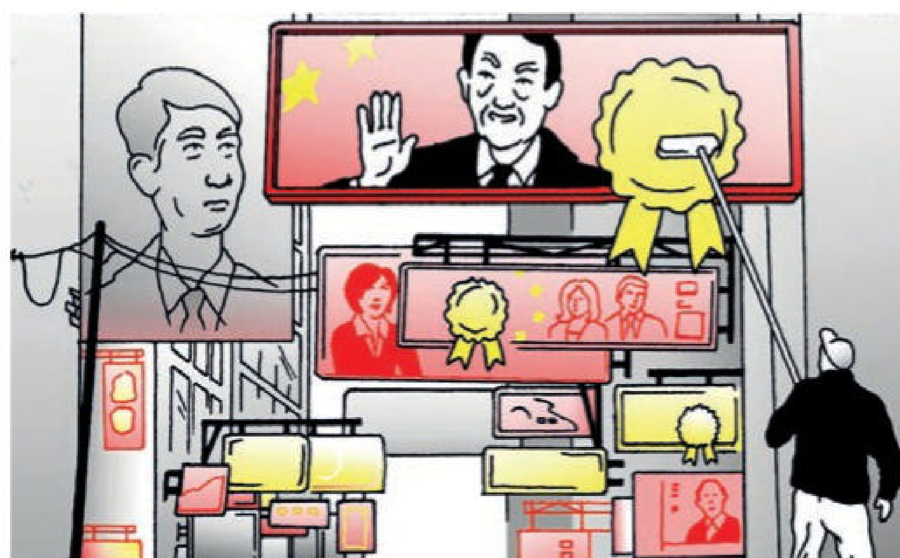


ILLUSTRATION BY DAPHNE GEISLER

► A Contentious Vote

Hong Kong holds legislative elections on Dec. 19. It's the first contest in the former British colony since the Chinese government revamped the city's electoral system to ensure only so-called patriots can hold political office.

► Olaf Scholz will for the first time represent Germany as chancellor at the European Council summit. Topics at the Dec. 16 meeting range from Covid to Brexit.

► The Federal Reserve sets rates on Dec. 15, followed the next day by the European Central Bank and the Bank of England. Many central banks have signaled an end to ultralow lending.

► Saudi Arabia is ready to unveil its budget the week of Dec. 12. Look out for clues that the oil-rich country is moving its economy away from fossil fuels and toward areas like infrastructure.

► Dec. 15 is the deadline to raise the U.S. debt ceiling. The Treasury Department has warned that the government could have difficulty meeting its obligations after that date.

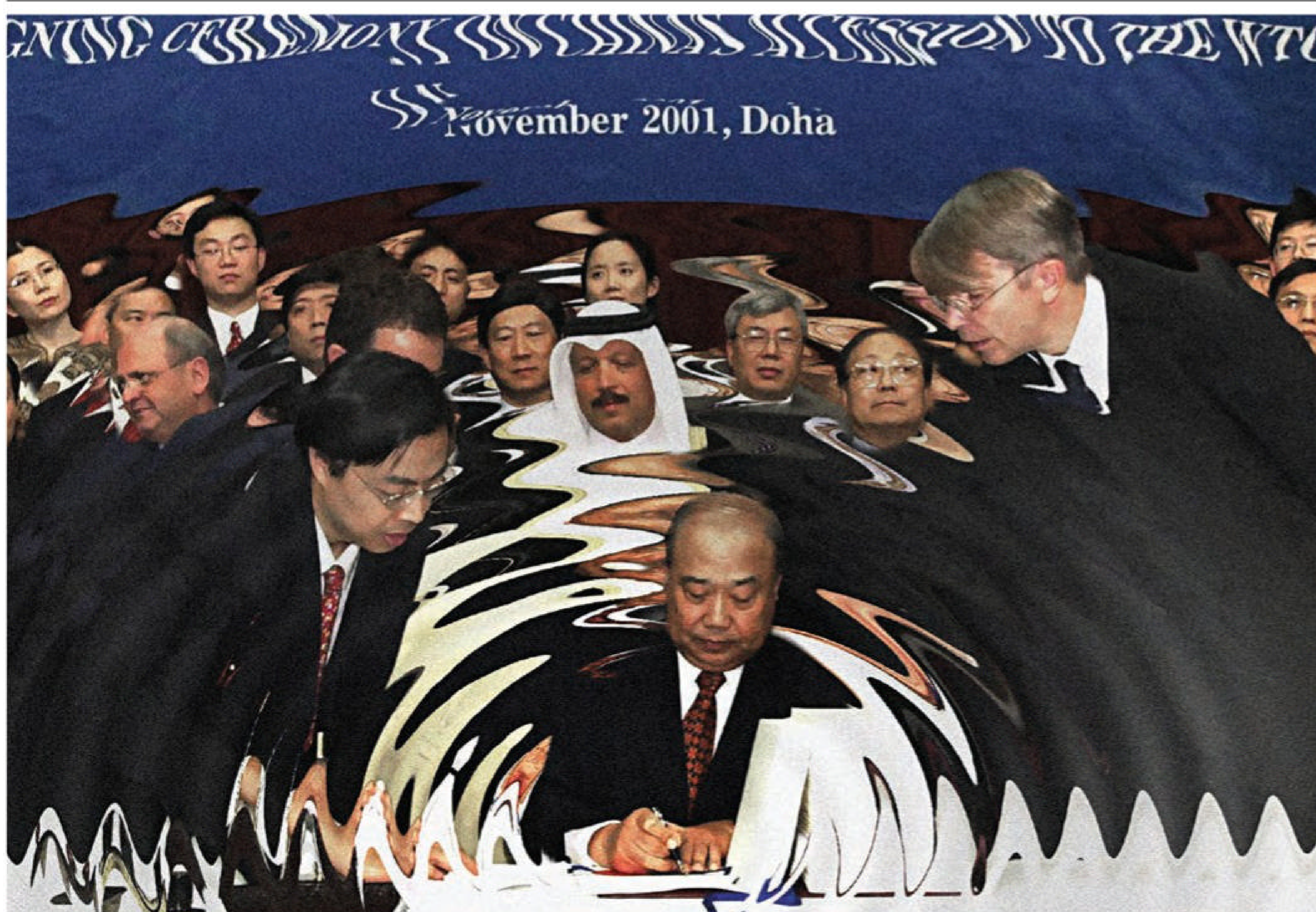
► French President Emmanuel Macron visits Hungary on Dec. 13 to conduct bilateral talks with President János Áder and Prime Minister Viktor Orbán.

► The annual Geminid meteor shower peaks overnight on Dec. 14. The Geminids can produce 50 visible meteors an hour, but a bright moon this year may outshine the fireworks.

Physical Distancing

Physical Distancing helps stop the spread of COVID-19. When someone coughs or sneezes, they can spray small liquid droplets from their nose or mouth which may contain the virus. So please remember to maintain a physical distance of at least 6 feet or 2 metres between yourself and others. Avoid all unnecessary physical contact. And please stay home when you can.

Find out more by visiting who.int



▲ Chinese Foreign Trade Minister Shi Guangsheng signs WTO accession documents in Doha in 2001

What Have We Learned From the China Shock?

● Washington needs to rethink how it responds to economic cataclysms to be better prepared for the next one

● By Shawn Donnan

If there's one area of bipartisan consensus to be found in Washington these days, it's China policy. Everyone, whether Democrat or Republican, is a China hawk, no matter how much they may differ about everything else, from mask mandates to the causes of inflation.

It's a remarkable change from 20 years ago, when a healthy majority in Washington supported China's Dec. 11, 2001, accession into the World Trade Organization. And one major and well-documented reason for the shift is the work of economists David Autor, David Dorn, and Gordon Hanson. Since 2013 they've been detailing the dislocation in the U.S. economy caused by a surge in imports from China, which had led to a loss of as many as 2.4 million jobs by 2011.

What's now known as the China shock has been linked to falling incomes in once-buzzing factory towns, political disaffection and the rise of Donald Trump, the dwindling marriage prospects of working men, the opioid crisis, and what economists Anne Case and Angus Deaton have called "deaths of despair."

In a working paper published in October, Autor, Dorn, and Hanson documented how, while the China shock actually peaked in 2010, it was still being felt as recently as 2019. Their report came with another sobering message: American policymakers haven't learned the right lessons from one of the most significant chapters in recent economic history. And that matters. Because there are more shocks coming.

The economists in their latest paper endorse the view that for the U.S. economy as a whole, China's rise has actually been

PHOTO ILLUSTRATION BY 731; PHOTO: GETTY IMAGES

beneficial. Apple Inc.'s successes with the iPhone wouldn't have been possible without Foxconn's sprawling manufacturing facilities in China, they point out. The problem is the job losses were concentrated intensely in places such as North Carolina's furniture belt and factory towns in the Midwest—and the policies meant to help those places recover were too timid. Which is why the economic and political consequences have endured.

Put another way, the China shock wasn't only, or really, a failure of trade policy. It was above all a failure of domestic economic policy. There may be a new bipartisan consensus on what's usually framed as the need to "get tough with China." But, as Autor, Dorn, and Hanson wrote, "despite these now well-documented adverse labor market impacts of globalization, there is no consensus about how to remediate such injuries."

Autor, Dorn, and Hanson argue that well-funded, targeted government policies could have helped prevent the economic blight that engulfed many affected communities. But everything from unemployment benefits to job retraining programs were "too small in scale" and "too limited in scope," says Hanson, who's on the faculty at Harvard Kennedy School. "We just weren't nearly generous enough."

One thing we've learned from the pandemic is that the U.S. is better at fighting a sudden crisis than a slow, grinding one. Washington spent trillions of dollars to blunt the economic pain from the Covid-19 recession, but the rescue effort was improvised and therefore more chaotic than it needed to be. European countries, in contrast, were able to fall back on long-standing programs, such as work sharing, that allowed workers to remain on company payrolls even while factories were idled or restaurants shuttered.

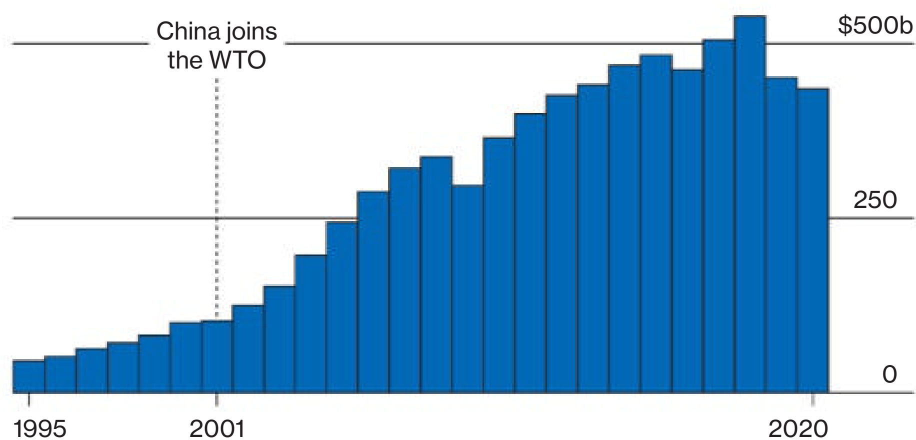
Certain American idiosyncrasies—including an overreliance on local taxes to fund schools and police departments—actually amplify the impact of economic shocks. When industry departs an area, local authorities often roll out fresh tax breaks to attract new employers. Communities then become trapped in a vicious cycle in which the tax base erodes, leading to cutbacks in public services and investment that cause families to pick up and move elsewhere. "We let places go to seed in a way that other countries don't," says Autor, a professor at the Massachusetts Institute of Technology.

The paper is pointedly critical of the tools the Trump administration deployed in the name of making some of these places great again: "The favored solution of populist politicians to regional distress is to raise import barriers and block immigration." Trump's tariffs on imports from China harmed a lot of consumers and businesses, as other economists have documented, without creating a meaningful increase in jobs. When President Joe Biden leaves those tariffs in place, he's just doing more of the same. "The idea that we can just tariff our way to prosperity is ludicrous," Autor says.

Autor also disapproves of Trump's decision to pull the U.S. out of the Trans-Pacific Partnership, the 12-nation trade agreement that the Obama administration negotiated. The TPP was

Export Dynamo

Chinese annual goods shipments to the U.S.



DATA: U.S. CENSUS BUREAU

built largely with an eye on securing America's place in the Pacific and gaining leverage on China, which isn't a party to the deal. It established tighter controls on state-owned enterprises and new rules for things like data flows that would have benefited American workers, Autor—along with Dorn and Hanson—argue. That Biden, like most in Washington, sees joining the TPP as too politically toxic only perpetuates the error.

Revisiting the lessons from America's inadequate response to the China shock may help policymakers make better choices when the next cataclysm strikes. At least that's what Autor, Dorn, and Hanson hope.

As Hanson wrote in *Foreign Affairs* earlier this year, the energy transition from fossil fuels to renewables is sure to bring another round of concentrated economic pain with its own consequences. For every new electric vehicle battery plant that opens, there's a combustion engine factory that's doomed to close. One community wins while another loses.

Although Biden's "Build Back Better" plan includes some spending for regions likely to be affected, there isn't nearly enough, Hanson argues. "The regionally concentrated joblessness" that hit the U.S. with China's ascension "is one of the great tragedies of the last 25 years," he says. And neither party has a platform "that confronts the possible expansion of that tragedy due to the energy transition."

Other shocks loom: robots and automation, another pandemic, and perhaps even a second China shock. Beijing has ambitions to become a dominant player in industries such as artificial intelligence, EVs, and semiconductors and is backing those up with billions of dollars in investment. Washington in response has embraced an industrial policy of its own, starting with subsidies for the construction of domestic chip plants.

But dealing with economic shocks isn't just about confronting geopolitical competition. It's about making sure your own citizens are protected from the effects of change. It's about having unemployment benefits that capture everybody equally, housing people can afford, and schools that can adapt to train a new generation of workers. Twenty years after China joined the WTO and the shock accelerated, it's still not clear that those embracing Washington's new political consensus on China get that. Ⓑ

Covid Pills Face a Truth Problem

● Merck's new medicine is set to enter a landscape where misinformation is widespread

Thirty-five years ago drug manufacturer Merck & Co. invented a groundbreaking treatment for river blindness, a disease that affects millions of people in Africa. The company donated billions of doses and frequently touted its philanthropy, building a narrative about the good a drugmaker can do.

Few people had ever heard of the tropical disease treatment until this year. Now that antiparasitic—ivermectin—is a household name, and the story is well out of Merck's hands. In the midst of the Covid-19 crisis, anti-vaxxers embraced it as a treatment for the virus despite a lack of scientific evidence to support its use. Merck has recently developed molnupiravir, a Covid treatment the company hopes will soon become a key tool in stemming the pandemic, even though it's entering a world in which rampant misinformation could undermine the use of new drugs. So the company is now in the odd position of telling the public both that molnupiravir works against Covid and that ivermectin doesn't.

The pharmaceutical industry hasn't found effective ways to combat misinformation thus far. Merck took a stab when it became obvious that people were turning to ivermectin—mostly known in the West as a medicine for livestock—as a Covid treatment after lab research showed it could inhibit replication of the virus. Studies in humans didn't prove it worked.

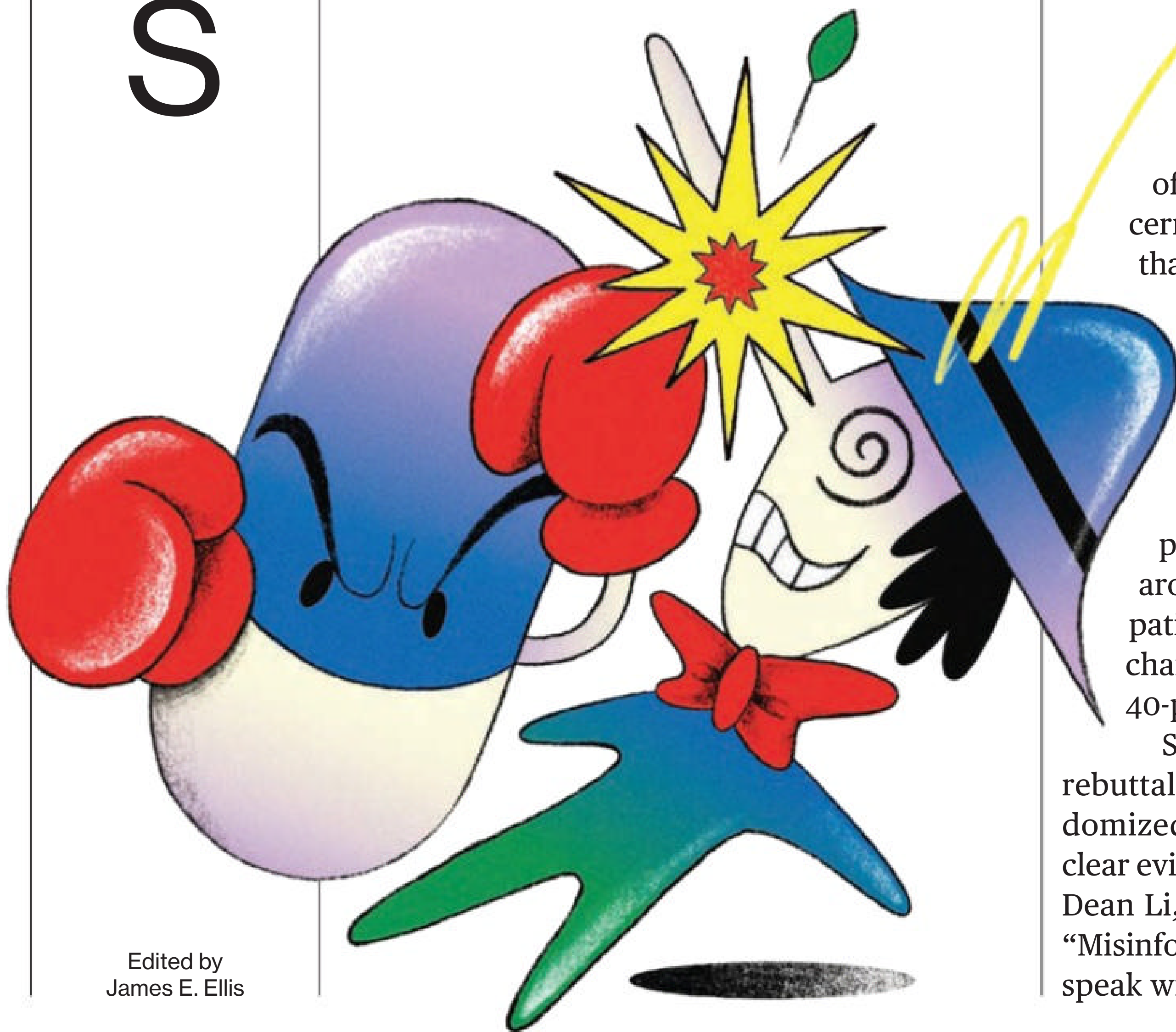


ILLUSTRATION BY CAMILO MEDINA

In an unusual move, Merck put out a press release about the use of ivermectin, saying in February there was "no meaningful evidence" it was effective against the coronavirus and noting "a concerning lack of safety data." The statement had no discernible effect: Ivermectin sales took off after that, with the biggest spike taking place over the summer months. Average monthly prescriptions this year in the U.S. are nearly 150,000, up more than sevenfold from 2019 levels of about 20,000.

Conspiracy theorists have gone so far as to suggest Merck is actively downplaying ivermectin, a generic drug that costs around $35 for 20 tablets, in favor of urging patients toward molnupiravir, for which it's charging the U.S. government $700 for each 40-pill course of treatment.

Still, the company has been muted in its rebuttal to the nagging claims. "We have a randomized, double-blind trial that is global with clear evidence of efficacy with molnupiravir," says Dean Li, president of Merck's research division. "Misinformation—I can't speak to that. I can only speak with regards to information."

Edited by James E. Ellis

Pfizer Inc., which also has a new Covid pill it hopes will soon get authorized, has faced similarly baseless claims. Some have even called the pill "Pfizermectin," implying the product is just a repackaged version of ivermectin. The company said in a statement that its antiviral "is not similar to that of an animal medicine and is not the same mechanism" as ivermectin. As far as tamping down on the rumors? A spokesperson declined to comment on that.

These incidents highlight pharmaceutical companies' vulnerability to misinformation and how little they've done to disprove such falsehoods. "For a company to clearly state that there's a use of their product that is not accepted would be very powerful," says Peter Lurie, a former U.S. Food and Drug Administration official who leads the Center for Science in the Public Interest. In other words, one press release isn't enough. Merck, he says, "could do it more, and it needs to reach the local level," such as by taking out ads advising against the use of ivermectin to treat Covid.

There is also the threat that molnupiravir ends up the victim of a fresh wave of misinformation based on real risks the drug may pose. Advisers to the FDA urged that the drug shouldn't be used in pregnant women based on concerns about birth defects. False claims that Covid vaccines could cause infertility have already hindered the U.S. vaccination campaign. So if information related to Merck's new treatment and reproductive health ends up being shared inaccurately, that could spawn yet another headache for the drugmaker.

For now, Wall Street doesn't see misinformation posing a big financial risk for the new Covid antiviral drugs, which are poised to bring in more than $5 billion for Merck and $10 billion for Pfizer through 2022, says Damien Conover, director of health-care equity research for Morningstar Inc. Because sales will initially come through government contracts, he says, the drugs may simply sit on pharmacy shelves if people are reluctant to take them.

The company making money off ivermectin isn't Merck—the giant drugmaker accounts for less than 1% of the ivermectin prescribed in the U.S., according to data from IQVIA Holdings Inc. Private-equity-owned Edenbridge Pharmaceuticals LLC, which manufactures a generic version of the pill, makes the rest. A product that brought in just shy of $800,000 in monthly sales on average in 2019 raked in revenue of $42 million in August alone, the IQVIA data shows. As far as misinformation goes, Edenbridge noted in a press release that ivermectin is not approved by the FDA to treat Covid. But a spokesman says it's supporting research into the drug's use for Covid by donating it for studies.

Part of the reason ivermectin's use has even been possible in the highly regulated U.S. health-care system is because of a practice known as off-label prescribing, in which a doctor is allowed to write a prescription for an unapproved use. Ivermectin has been approved in the U.S. for parasitic infections, rosacea, and head lice. When prescribed for purposes beyond those, the FDA doesn't get involved. "It is part of the practice of medicine," an agency spokesperson says.

Although doctors are usually the gatekeepers, ivermectin developed a life of its own with celebrities who have remained unvaccinated such as Joe Rogan and Aaron Rodgers saying publicly they've used the drug as a Covid treatment. That's helped send patients to doctors asking for the antiparasitic. And they can easily find a prescriber by using an online directory featuring more than 300 clinicians, run by an ivermectin-promoting group called the Front Line Covid-19 Critical Care Alliance.

Others have sought out veterinary formulations, which is dangerous because they typically come in doses meant for large animals. "You are not a horse. You are not a cow. Seriously, y'all. Stop it," the FDA tweeted in August, at the height of the craze. A rare joke from the federal agency, the tweet went viral. Nonetheless, some 144,000 ivermectin prescriptions were dispensed by pharmacies in October of this year, up from about 27,000 during the same month in 2019.

"You are not a horse. You are not a cow. Seriously, y'all. Stop it," the FDA tweeted in August

Surgeon General Vivek Murthy recently put out a 22-page toolkit on misinformation and the role individuals, educators, health professionals, and others can play, encouraging empathy, question-asking, and direction to reputable sources. The report stated more work needs to be done to figure out the most effective strategies to combat the problem.

The factors that keep people unvaccinated and draw them to ivermectin aren't going away, says Peter Hotez, dean of the National School of Tropical Medicine at Baylor College of Medicine. Medical boards need to crack down on the practitioners pushing it for Covid, he says. "I don't see many of those individuals who are touting the benefits of ivermectin suddenly abandoning ivermectin in favor of the antivirals that actually work," he says. "Some will, but I think many of them actually won't." *—Emma Court*

THE BOTTOM LINE Ivermectin demand has soared despite scant evidence it's effective against the coronavirus. Now drugmakers' new Covid treatments may be affected by the misinformation.

The SEC Puts the Brakes On EV SPAC-Mania

● Young electric car companies have drawn big valuations from investors. Now they're drawing regulator scrutiny, too

Here's a sure sign that a SPAC-lash is afoot. Electric vehicle startup Lucid Group Inc., whose market value once soared past that of General Motors Co. this year, said on Dec. 6 that the U.S. Securities and Exchange Commission was probing its barely five-month-old blank-check merger and business projections given to investors. The admission sent the stock reeling.

It was a surprise disclosure from a company that's seen as having real potential in the electric vehicle race. Lucid Chief Executive Officer Peter Rawlinson came from Tesla Inc., and in September the U.S. Environmental Protection Agency certified that the company's Air sedan can travel a world-best 520 miles on a single charge. And Lucid had gone public with far more credibility than fellow SPAC newbies Nikola Corp. and Lordstown Motors Corp., both of which ousted their CEOs in the past two years after SEC investigations.

Only early this year, SPAC deals—in which companies go public via a merger with a company formed specifically to make acquisitions—were among Wall Street's favorite investments. Now there is scrutiny from all sides. The SEC is taking a harder look at the transactions, particularly at financial disclosures and statements about their prospects as public companies. Meanwhile, investors are playing it safer and opting out of more of the mergers. And stocks in many of the post-merger deals have fallen, another indication that market enthusiasm is waning. "The notion that a SPAC is price certainty is a fantasy," says New York University School of Law professor Michael Ohlrogge. "People are realizing that the deals they thought were great are not."

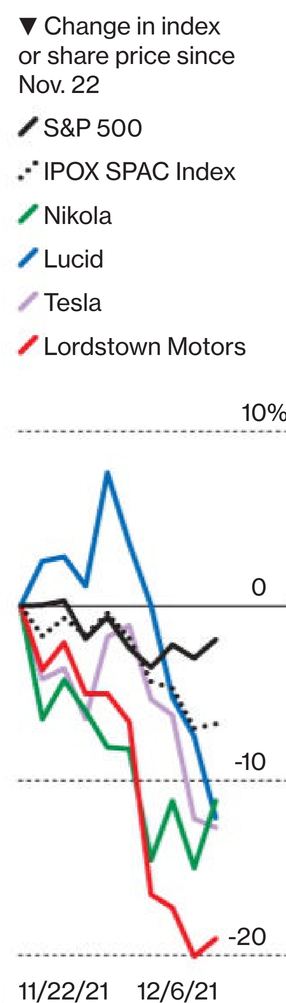
SPAC deals with EV startups seem tailor-made to run afoul of skeptical regulators and investors. It takes several years to get a new vehicle to market, and the companies usually rely on battery makers for key parts of their technology and have less experience than established carmakers when it comes to ramping up production. Delays are common. If they do meet production targets—something even

◀ Lucid CEO Rawlinson with an Air sedan prototype in August

Tesla repeatedly failed to do in its early days—there is little consensus on how quickly consumers will trade gas burners for plug-ins. That makes sales forecasts something of a guessing game.

Although electric car makers are the latest to get dinged, SPAC stocks as a group are down this year. The IPOX SPAC Index has tumbled almost 12%, while the S&P 500 has risen about 25%. Retail investors had initially embraced SPACs as a way to get in on growth stocks and, more often, a way to make a quick buck—the latter has become tougher to realize. In the first quarter the average share price of a SPAC company the day after it announced a merger was $15.77. By November the average price was about $10 a share, according to the paper "A Sober Look at SPACs," which Ohlrogge wrote with Stanford professors Michael Klausner and Emily Ruan.

These stocks are settling at around the $10 a share that investors typically pay for the stock of a SPAC before it makes a merger deal. And more planned deals are being restructured, says SPAC Research, which tracks blank-check companies and activity. The company's website said that in this year's third quarter, SPAC deals had almost 60% of shareholders asking to redeem their invested capital rather than holding their investment through the planned merger. So far in the fourth quarter, the rate is above 60%. That's a big change from the first quarter, when only 12% of ▶



▼ Change in index or share price since Nov. 22

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Manhattan's One Vanderbilt office tower—taller than the Empire State Building—is "a physical reminder of New York's resiliency," says SL Green Realty Chairman & CEO Marc Holliday. It funded improvements to neighbor Grand Central Terminal and has a broad array of green building features. Wells Fargo led a $3 billion commercial mortgage-backed securities bond offering backed by One Vanderbilt—the largest U.S. green bond offering ever, says Kara McShane, Head of Commercial Real Estate at Wells Fargo Corporate & Investment Banking.

bloomberg.com/questforbetter

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▲ Construction at Lucid's Arizona factory in May 2020

CAITLIN O'HARA/BLOOMBERG.

◀ SPAC shareholders asked for their cash back.

The SEC clearly has been taking a closer look. The same day Lucid disclosed the investigation, Digital World Acquisition Corp., the SPAC that's agreed to merge with former President Donald Trump's Trump Media & Technology Group, said it was being probed by regulators. "The SEC is spending more time reviewing proxies, and it is asking more questions," Klausner says.

Still, some of the highest-profile calamities in the SPAC world have been electric vehicle companies. Retail investors were all looking for the next Tesla, which is now worth $1 trillion. Now many have swallowed big losses.

Nikola was the first to run into public trouble. The SEC investigated the company after short seller Hindenburg Research in September 2020 issued a report saying Nikola had no technology of its own. The missive said the company had displayed a hydrogen fuel cell truck that didn't run and that founder Trevor Milton rolled it down a hill. After the company's own investigation found that Milton had made questionable assertions, he left the carmaker. (The U.S. Justice Department has since charged him with securities and wire fraud for allegedly making false statements to boost Nikola shares.)

Lordstown Motors had similar management problems when a short seller's report said that company founder Steve Burns had overstated purchase interest for its electric Endurance pickup truck. The company's board removed Burns after its own investigation.

Lucid didn't say what exactly the SEC is investigating about its projections. Several law firms have been investigating the company in preparation for suits over it missing its plan to start building the Air sedan in the second quarter. After announcing its SPAC deal early this year, the company said the next day that it wouldn't build cars until the second half, which hurt the shares.

Lucid shares have fallen 20% since just Nov. 29 and almost 8% since disclosing the SEC investigation. But the shares are trading at almost $44, which is more than four times the price initial shareholders paid before the merger.

Even without regulatory problems, new electric vehicle companies such as Lucid are going to face a tough road to match Tesla's success.

"Tesla came into an empty market and had no competition," says Sam Abuelsamid, an analyst at Guidehouse Insights. "These guys are arriving as the legacy automakers are doing the same thing. They are about to launch a couple hundred EV nameplates over the next three years. It will be hard to replicate what Tesla did." —*David Welch*

THE BOTTOM LINE Retail investors embraced SPAC deals for electric car makers in hopes of spotting the next Tesla. Instead, many have seen values drop as regulatory scrutiny increases.

I Live a Life of Climb

I was an economist with a master's degree from the London School of Economics, and I felt like I could do more. After witnessing horrific conditions in an elder living facility where I volunteered, a friend challenged me to do something about it.

That's when I decided to create a community that was different than anything I'd seen. In 2006, I became CEO of Rose Villa, a neglected community with no infrastructure development and few computers. When I joined Vistage in 2010, we had a vision of what it could be — and needed $70 million to get started. While I couldn't be fully transparent with my direct reports at the time, I could share my journey with my Vistage peers. They helped me think through decisions, vet ideas and gain my footing. The group and my Chair supported me every step of the way.

Today we are a nationally known, state-of-the-art community with several net-zero energy neighborhoods. We're in the final phase of a $166 million expansion. My staff is fully empowered, allowing me to focus on the big vision — to grow and evolve.

I'm Vassar. I live a life of climb.

Vassar

Vassar Byrd
Chief Executive Officer, Rose Villa, Inc., Portland, Oregon
Vistage member since 2010

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Navigating Covid

The pandemic has been hard on almost every business. But for a company that depends on travelers, like Marriott International Inc., the world's largest hotelier, it's been particularly tough. Its top executives told us how they coped while keeping their people-first focus. ——*Shery Ahn*

● DAVID MARRIOTT
Incoming chairman and grandson of the founders

Our business dropped 90% overnight at the beginning of the pandemic. And anytime you face a situation like that, you're forced to make some extremely difficult decisions. For us as a people-first culture, having to lay off or furlough tens of thousands of workers was really heart-wrenching. So we had to adjust our operational approach at the hotel level to really use technology to enhance our service strategies and to be creative financially—asking not only how can we survive the pandemic, but how can we ensure that our owners survive the pandemic and how do we ensure that our guests and associates are safe during a time like this.

I think technology [like contactless check-in via mobile phones] gives you the tools to better service the guest and the customer. Again, it's not to replace that face-to-face interaction, because we are a people business. We always have been a people business; we always will be a people business. But technology can enhance our ability to deliver services to our guests and customers to ensure that they want to stay with us and return for years to come.

● LEENY OBERG
Chief financial officer

It's not as much about having fewer staff as different [roles]. What a guest can do now with Mobile Key and communicating with us on their phone can allow them to not spend much time, if any, at the front desk. That then allows our front-desk folks to be able to be doing other things, to make your stay special. So I think it's more about how we serve our guests and the way they want to be served, rather than exactly the number [of people serving them].

While for sure the most painful part of this entire pandemic was the furloughs and the layoffs that we had to do, it was necessary to survive, to make sure we got through to the other side. And so we will be focusing tremendously on really rebuilding because of what happened with our associates.

It's important to focus on the team who is helping you get through it. And after all the calls that were on virtual two-dimensional screens, it's really important to stop and ask people: "How are you doing? What's going on? How's your family? How are you getting through this?" Because even though we were in a crisis, at the end of the day, we're all in this together as people.

At the end of the day, hospitality is all about welcoming all. So from Day 1, the company has been making sure to welcome everyone, no matter your background, no matter where you come from. And I think our associate team needs to reflect that same spirit.

It's our view that if your people feel valued, they will also treat customers as though they are valued.

I always remember watching Bill Marriott or [former CEO] Arne Sorenson go on a hotel tour. And although they were happy to see the general manager, all they really wanted to talk to was the bell person or the kitchen staff or the steward in the kitchen. Because frankly, that's where the real information comes from.

● TONY CAPUANO
Chief executive officer

A lot of the initiatives that were in place even before the pandemic began to unfold—more consumer-facing technology, mobile check-in, Mobile Key, the ability to chat by text with our associates—will continue to serve us well. They'll be more important in a post-pandemic world.

The pandemic tested the "stickiness" of some of our most loyal customers who didn't stay in a hotel for a year. But through our branded credit card programs, through the partnership with Uber that we rolled out, we found other mechanisms to keep connected with our customers, even in a period where they were grounded and not traveling at all.

If you're one of our guests, I want to be engaged with you, not just from the time you walk through the front door and leave, but throughout your trip planning. I want you planning your trip using the wealth of information that's available through the Bonvoy app. I want to see you talking to our folks. And I think blending the technology that allows us to stay engaged with you with that in-person genuine care once you walk through the front door is what our guests would like to see.

● Interviews are edited for clarity and length.

COURTESY MARRIOTT

Photographed responsibly by Pablo with a tripod

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2

TECHNOLOGY

● Joseph Staten at 343 Industries' *Halo* museum in Redmond, Wash.

What a Difference A Year Makes

● *Halo Infinite* was far off track last summer. Now a risky delay seems to have paid off

In July 2020, Microsoft Corp. showed a nine-minute trailer of *Halo Infinite*, the latest installment from its blockbuster gaming franchise, which has sold more than 81 million copies and brought in almost $6 billion. *Halo* fans had been waiting to get a taste of the game since the company first told them about it two years earlier, and Microsoft was counting on their enthusiasm to propel sales of its newest Xbox, which it planned to release in the fall. The trailer showed an expanded playing field and new weapons, but gamers immediately fixated on the graphics, which were so blocky that cynical fans began to joke that Xbox must have mixed up its *Halo* and *Minecraft* franchises.

Even within Microsoft, there was wide acknowledgment that releasing a half-baked demo was a big mistake. "We should have known before and just been honest with ourselves," Phil Spencer, Xbox's head, said in a recent interview with *British GQ* magazine. "We were there not out of deception, but more out of… hope. And I don't think hope is a great development strategy."

Microsoft reluctantly decided to push back the release date. It then tapped Joseph Staten, the lead writer for the first three *Halo* games in the early 2000s, to get things back on track. Staten had stepped away from the franchise in 2009 and was serving as a senior creative director for Microsoft, where he worked on other big games, including *State of Decay* and *Crackdown*. A month after the debacle

Edited by Joshua Brustein

STATEN: PHOTOGRAPH BY MERON MENGHISTAB FOR BLOOMBERG BUSINESSWEEK. HALO INFINITE: COURTESY 343 INDUSTRIES

with the demo, Staten rejoined 343 Industries, the Microsoft-owned gaming studio that makes *Halo*, as its creative director. One of the first things he did was remind the studio's demoralized staff that the franchise's long-running success had actually been marked by several bumpy introductions, including a disastrous demonstration of the very first *Halo* game in 2001 that almost doomed the series before it even got started. "We've had some rough demos over the years," he says.

Staten also persuaded Microsoft's leadership to give 343 as much time as it needed to fix things. Microsoft saw *Halo* as critical to influencing gamers to buy the new console, but releasing a buggy version could have soured players on the game.

The studio made that mistake once before, with its 2014 release of *Halo: The Master Chief Collection*, whose multiplayer version was so glitchy that 343 ended up making multiple public apologies. Serious gamers still remember the episode as a significant breach of trust that Microsoft couldn't afford to repeat. "There's nothing worse for a game than to release it and have all sorts of bugs or things that are going to ruin the gameplay experience," says Jason Brown, who once competed in Halo's professional e-sports league under the name Lunchbox.

The risky decision to slow down seems to have transformed a potential disaster into a real success. In November, 343 surprised fans by releasing a free multiplayer mode of *Halo Infinite* on the 20th anniversary of the release of the first *Halo* game. By the next day, the game had set an Xbox record for most concurrent players on the online gaming platform Steam. The full version went on sale Dec. 8 to positive initial reviews. "*Halo Infinite* can't just be another *Halo*. It needs to be the *Halo* that exists in your imagination," wrote CNET reviewer Mark Serrels. "And incredibly, against all odds, it pretty much is."

Gamers, notoriously difficult to keep happy, seem ready to forgive Microsoft for its false start. "I don't want to say the *Halo* community has done a 180, because gamers now are just kind of skeptics, but they've turned maybe 130 degrees," says Matt McDonald, moderator of a *Halo* forum on Reddit.

Halo pits a genetically modified Marine—the Master Chief—in a battle against a religious cult of aliens, with the future of humanity on the line. Coming into being alongside the first Xbox, it's been produced in-house at Microsoft since its inception. In 2007, 343 took over production of *Halo* from Bungie, the studio that made the earliest versions. The Microsoft-owned studio has been characterized by flawed internal tech tools, infighting, and high turnover, according to interviews with more than 20 current and former employees, who requested anonymity because they weren't authorized to speak publicly.

All those factors played a role in the difficulties with *Halo Infinite*, which the studio began planning in 2015 just after *Halo 5*, the last full installment of the game, was released. After kicking around various formulas, the developers landed on an idea that stuck: *Halo* as an "open world" game. Rather than progress through a series of levels, players would explore a giant land mass, completing missions in any order, as they did in Nintendo Co.'s 2017 *The Legend of Zelda: Breath of the Wild*, which is considered one of the greatest games of all time.

"I don't think hope is a great development strategy"

Video games are built using software tools called gaming engines. The engine used to build *Halo* was one that 343 had based largely on old code from Bungie. Parts of the engine, a set of tools called Faber, became infamous at the studio for being buggy and difficult to use. Within engineering, there's a concept known as "tech debt," which refers to problems one puts up with because the previous programmers of a system chose quick, easy solutions over more sustainable ones. Faber's code, some of which dated to the early 2000s, had so much debt that some 343 engineers mockingly referred to its "tech bankruptcy."

The staffing at 343 was also unstable, partially because of its heavy reliance on contract workers, who made up almost half the staff by some estimates. Microsoft restricts contractors from staying in their jobs for more than 18 months, which meant steady attrition at 343.

▲ *Halo Infinite* received positive initial reviews

Halo Infinite's creative direction was also in flux until unusually late in its development. Several developers described 343 as a company split into fiefdoms, with every team jockeying for resources and making conflicting decisions. One developer describes the process as "four to five games being developed simultaneously."

By the summer of 2019, *Halo Infinite* was in ▶

◀ crisis mode. The studio decided to cut almost two-thirds of the entire planned game, leaving managers to instruct some designers to come to the office and do nothing while the studio figured out the next move. Eventually the game's open world was cut back from a vast, *Zelda*-like experience into something far smaller. It soon become clear to some on the team that, even with the compromises, getting *Halo Infinite* into decent shape by the following fall would be impossible. Still, the timing of the release didn't seem up for discussion. Microsoft told 343 that it had to be a launch game for the next Xbox, which meant releasing it in November 2020.

The demo changed all that. Microsoft said on Aug. 11, 2020, that it would delay the game, though it left the exact timing vague. When Staten arrived, he pushed his bosses to let 343 take its time, presenting them with a list of features that would make *Halo Infinite* a success if time weren't the only factor. "Here's a list of all the things we could do to make this game excellent," he recalls telling them. "Here's what more time buys us."

As a player, Staten liked how computer-controlled Marines in earlier versions would join up with him on his battles. At the time he took over, he says, Marines in *Halo Infinite* were programmed to stay frustratingly close to the spots where the player first encountered them. "Every once in a while I run into a couple of Marines," Staten says. "But they kind of stay where they are, and they don't join me on my adventure, and they're not part of that heroic feeling that you get from classic *Halo* games."

In the end, 343 fixed the graphics problems, and Staten got his roaming Marines. But *Halo Infinite* isn't yet a finished product. That's OK in a way that wouldn't have been true for past versions. Since the release of the last full version of the game, the industry has moved more toward regularly updated games than periodic releases of entirely new titles. The studio is planning to add some key features as updates, including co-op mode, which lets gamers play the campaign with a friend, and forge, which allows for the creation of multiplayer maps.

For now, Halo players are content to play the version 343 is releasing. "It just has a really good balance of new and old, which can cater to classic and newer fans alike," says Marcus Lovejoy, who competed in *Halo*'s professional e-sports league under the name "Elumnite" before becoming a team manager. "That has been one of the biggest game changers." *—Dina Bass and Jason Schreier*

THE BOTTOM LINE Microsoft wanted to release the latest *Halo* with the new Xbox, but avoided disaster by putting the release off to fix serious issues with the game.

Andreessen Horowitz's Founders Take the Show to Vegas

● Spending less time in Silicon Valley and cutting back on board seats look like the start of their slow process of stepping back

Recently, the Bay Area-based venture capitalist Ben Horowitz took part in a popular pandemic-era pastime: updating the location on his LinkedIn profile. Goodbye, California. Hello, Las Vegas.

The change is notable among the wave of personal relocations because Horowitz has been one of Silicon Valley's biggest boosters for years. His partner, Marc Andreessen, has also purchased property in Nevada.

Their individual real estate decisions are one sign of a significant, if slow-motion, shift at their company, the prominent venture capital firm Andreessen Horowitz, or a16z. They started a16z in 2009 after selling a data center automation startup they co-founded for $1.6 billion. Over the next decade or so, the firm helped define an era in Silicon Valley's tech and venture capital industries as they backed tiny startups that turned into multibillion-dollar businesses, with enormous economic and cultural implications. A16z has backed many of the world-beating startups of the past decade, including Airbnb, Coinbase, GitHub, Slack, and Stripe. (Bloomberg LP, which owns *Bloomberg Businessweek*, has invested in Andreessen Horowitz.)

The firm's founders, while still active leaders with the ultimate responsibility for its strategy and direction, are no longer as involved in daily operations as they were in the early days, say people who have worked with the men and those around them.

ILLUSTRATION BY KLAUS KREMMERZ. ANDREESSEN: BLOOMBERG. HOROWITZ: GETTY IMAGES. DATA: PITCHBOOK, COMPILED BY THE NATIONAL VENTURE CAPITAL ASSOCIATION 2021 YEARBOOK

They've also begun to lower their involvement on corporate boards. Horowitz sits on 11 boards, down from 16 early last year; Andreessen's biography lists 7 company board seats, including on Meta Platforms Inc., down from 11 three years ago. Andreessen and Horowitz declined interview requests through an a16z spokesperson, who also declined to answer questions about the firm.

Both men have told the firm's investors their current roles are as player-coaches, according to two people familiar with the matter who requested anonymity to discuss private conversations. Transitions like this often take place in phases, according to Donna Hitscherich, director of Columbia Business School's private equity program. "Change doesn't happen in five years," she says. "It's 10 years, or generational."

A16z has consistently pushed the boundaries of venture investing. It aimed to provide more than money to startups, holding regular mini-conferences to introduce founders to potential Fortune 500 clients and promoting its companies heavily. It elevated its in-house public-relations expert, Margit Wennmachers, to partner, an unprecedented move for the traditionally low-key venture industry.

Andreessen Horowitz also paid what other firms considered outrageous sums for young startups, raising the bar for competitors and paving the way for SoftBank Group's heavy-spending Vision Fund. In 2019 it also restructured as a registered financial adviser so it could invest in assets such as cryptocurrency. As each tweak to the formula proved successful for a16z, other firms followed suit.

Earlier this year, Andreessen told David Rubenstein on Bloomberg TV that it managed $18 billion in assets, making it one of the biggest venture firms. He also said that when it came to investments, he and Horowitz were "in the middle of everything."

That said, a16z's structure is unusually decentralized for a venture firm, with its two dozen general partners controlling their own budgets and empowered to make investment decisions without a partnership vote. "We run a non-consensus process, very deliberately," Andreessen said.

This should make it easier for new leaders to distinguish themselves, but the firm's future is uncertain. "Succession is the No. 1 reason why VC firms blow up," says Jo Tango, who teaches a class on venture capital at Harvard Business School. "These are self-managing clubs" with no set formula for a changing of the guard.

There isn't an obvious successor at a16z. Jeff Jordan, who's worked as a managing partner since 2011, has taken on responsibility for managing the burgeoning staff, and now supervises about 60 investment professionals. Scott Kupor, another managing partner who's been at the firm since its inception, oversees relations with investors and helps structure a16z's new funds.

Just before Horowitz updated his LinkedIn profile, he bought a $14.5 million hilltop house in Las Vegas, according to a person familiar with the deal. The house, with Strip views, a miniature golf green, and a wraparound pool built mostly under a double-story overhang, was once owned by luxury hotelier Sam Nazarian.

Officially the buyer was LV Raiders LLC, a holding company based at an office building in Palo Alto, Calif. Horowitz has been a longtime fan of the football team, which moved to Las Vegas from Oakland in early 2020. In addition to being more convenient for their home games, the new homestead could make it easier to hang out with the rappers he's famously spent years befriending, since many regularly play shows and hang out in the city. And, of course, there's Nevada's lack of personal income tax, compared with a 13.3% marginal income tax rate for high earners in California.

Andreessen made an even more lavish Nevada real estate purchase, a $36 million deal in June for four adjoining undeveloped parcels in the exclusive Summit Club section of Las Vegas, according to a person familiar with the transactions. (In November, he also purchased a $177 million estate in Malibu, the most expensive purchase on record for a California residence.)

Although the men work less than they did a decade ago, they still care deeply about the firm, people familiar with the matter say. And they keep spending time in Silicon Valley, even if they like escaping their local prominence. "I get noticed," Andreessen told Rubenstein. "Outside the Valley: very, very, very anonymous." *—Sarah McBride and Lizette Chapman*

THE BOTTOM LINE A firm that helped define a foundational period in Silicon Valley's history begins to face questions about its own long-term future.

▼ Largest U.S. venture funds that completed capital raising in 2020

Fund	Amount
Tiger Global Private Investment Partners XII	$3.75b
New Enterprise Associates 17	3.60
Andreessen Horowitz LSV Fund II	3.23
General Catalyst Group X	2.30
The Climate Pledge Fund	2.00
Lightspeed Venture Partners Select IV	1.83
Lightspeed Opportunity Fund	1.50
Founders Fund Growth	1.50
Andreessen Horowitz Fund VII	1.34
Addition One	1.30

● Andreessen

● Horowitz

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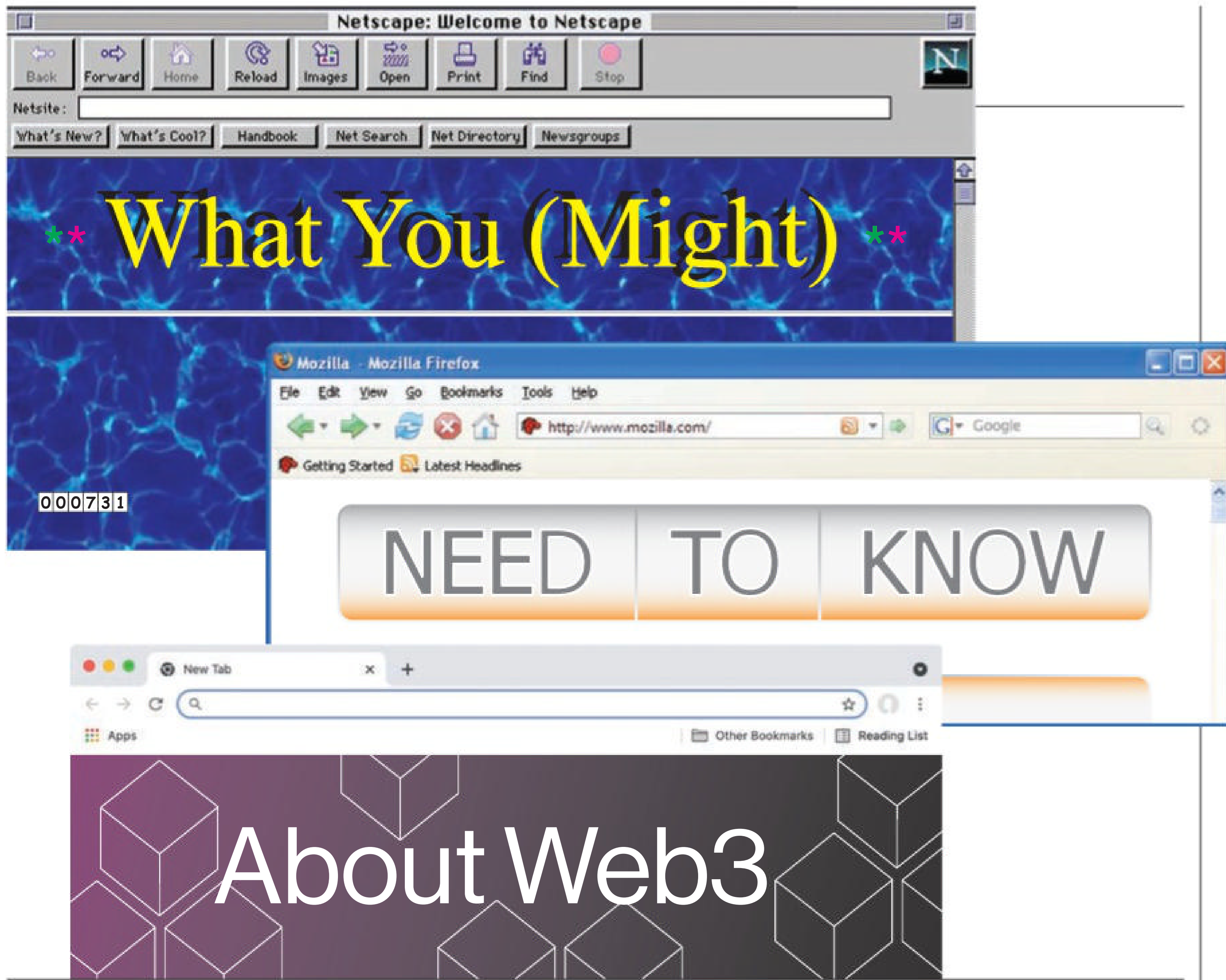


● Crypto enthusiasts say tokens can change computing. Is this the real deal or vaporware?

If you follow the world of cryptocurrency even casually, you know it produces a constant supply of jargon. There's NFT, dapp, DeFi, and tokenomics, to name a few. Brace yourself for a new one: Web3. The idea is that crypto isn't just for sending money or speculating with, but could be used to build a whole new web. If the believers are right, this is one bit of cryptospeak worth getting familiar with, even if you never touch Bitcoin.

Of course, the software behind the internet is changing all the time. What makes Web3 different—and more than a little weird—is that it would build financial assets, in the form of tokens, into the inner workings of almost anything you do online. And by doing so, its boosters say it could supplant corporations with decentralized, internet-based organizations governed by software protocols and the votes of token holders. "It's the first real consumer penetration" for crypto, says Jeff Dorman, chief investment officer of crypto fund Arca. "Over time, every company became an internet company. I think it will happen here in digital assets."

Skeptics—and there are many—say this stuff is a long way from proving its use beyond niche applications, many of them tools aimed at crypto traders. It may also be an attempt to get around regulation, at a time when policymakers are gearing up to set clearer rules for crypto. In sum, Web3 is a heady mix of creative new projects, techno-utopianism, and financial engineering. Here's a beginner's guide to what you need to know.

● WHY IS IT CALLED WEB3? WHAT WERE WEBS 1 AND 2 AGAIN?

The term Web 1.0 generally describes everything from the earliest interconnection of computer networks in the 1970s and '80s to the first flowering of browsers and websites in the '90s. In the next phase, Web 2.0, companies built applications on top of that, from social media to search engines to wikis, much of it based on content generated by users. Although that made much of the web in one sense decentralized, most things still run through big companies. The idea of Web3 is to create software and platforms that aren't dependent on traditional companies and Web 2.0 business models such as advertising. For example, users might pay for services directly using tokens. In an ideal world, Web3 services are supposed to be operated, owned by, and improved upon by communities of users. (As to why it's Web3 and not Web 3.0, ▶

Edited by
Pat Regnier

ILLUSTRATION BY 731

◀ chalk it up mostly to changes in how developers talk online.)

● WHAT'S THIS HAVE TO DO WITH CRYPTO?

Bitcoin, the original cryptocurrency, works by having a public database called a blockchain record every transaction. It's decentralized because this ledger is maintained not by one company but by a vast network of computers all connected to the internet, whose operators are rewarded for the work with the chance to earn more Bitcoin. But you can do more with a blockchain than record transfers of digital coins. You can use it to make contracts and control how software and apps work.

Web3 applications are often based on a technology called Ethereum, which like Bitcoin rewards the users who help maintain its network. Its coin is called Ether, which has a total market value of $511 billion. The apps themselves can also have associated tokens, which may not only pay for services but act like voting shares that govern the apps' development and even fee structure. At least early on, much of the incentive for this activity often is the chance for appreciation in the token's price. It might rise as more users join the community, but of course it can also be inflated by speculation. There's a lot of that in crypto.

● WHY AM I HEARING MORE ABOUT THIS?

The speculative boom is a big part of it, but it's also that people are starting to see the tech in real life. As Bitcoin and other cryptocurrencies rallied earlier this year, venture capitalists poured billions of dollars into building and improving distributed apps, or dapps. Many dapp teams also received distributions of coins, which rose in value—spurring more interest. "We're at an inflection point that will lead into an even faster pace of innovation and growth in Web3," says Ali Yahya, a crypto general partner at venture capital firm Andreessen Horowitz. (Bloomberg LP, which owns *Bloomberg Businessweek*, has invested with Andreessen Horowitz.)

More than 8,700 active dapps are listed on tracker DappRadar. They include lots of crypto trading platforms and games. Sometimes the line between those is fuzzy: Many games involve winning and trading nonfungible tokens, or NFTs, which are virtual characters or collectibles that can fetch sky-high prices.

Operating through a distributed network can be clunky, but the user experience is getting better. "It's still early, but it's been transformed in the last six months," says Jonathan Dotan, founding director of the Starling Lab, a research nonprofit hatched out of Stanford and the University of Southern California Shoah Foundation that's working on using cryptography and decentralized networks to help preserve and verify documents including sensitive historical records. One of the group's projects is to upload more than 55,000 video testimonies of genocide survivors to Filecoin, a distributed network where more than 3,500 providers around the world store files on their computers in return for FIL tokens. The Starling Lab is now able to pour three times more data per day into Filecoin than at the beginning of the year, says Dotan.

In October, Dish Network Corp. partnered with startup Helium Inc. for 5G wireless connectivity. Hotspot providers get paid in the token HNT for offering coverage. "What people are starting to realize is this is a very new opportunity that's reminiscent of Airbnb or Uber," says Helium Chief Executive Officer Amir Haleem. The city of San Jose is setting up 20 Helium hotspots to earn HNT tokens to help cover internet access for some low-income residents.

Twitter Inc.'s engineers are working on Bluesky, a decentralized version of social media. Gaming company Ubisoft announced on Dec. 7 it will let players in one game get NFT collectibles such as vehicles for their characters. In other words, decentralized apps will face plenty of competition from traditional web players. "The biggest battle here is with the big tech companies," says Aaron Brown, a crypto investor who writes for Bloomberg Opinion. "The financial incentive of these companies is basically to hijack Web3" with Web3-like versions of their apps.

● DO I CARE IF APPS ARE DECENTRALIZED?

"Centralization is convenient," says Brown. Web3 is likely to be "a place for niche groups. People who are developing new ideas." The goal of many such undertakings is to become a DAO, or decentralized autonomous organization—effectively, thousands of users governing a project through chat groups and their tokens. "I think DAOs will be as ubiquitous as companies, clubs, nonprofits, and different kinds of 'official' organizations today," says Maria Shen, a partner at venture capital firm Electric Capital.

● WHAT ARE THE DOWNSIDES?

Although Web3 is often described in terms of idealistic cooperatives, decentralization can also be a cover for business as usual with less accountability. Regulators are raising concerns about some projects, particularly decentralized finance, or DeFi, apps that let people lend, borrow, and trade coins with each other, often without verifying users' identities or performing anti-money-laundering checks. Many teams of developers claim they aren't responsible, because they've passed control on to their users. "What are these dirty little secrets that

"You can arrest the people, the regulators can put them in jail, but you can't stop the protocols"

ILLUSTRATION BY PATRIK MOLLWING

no one talks about?" says Avivah Litan, an analyst specializing in blockchain at researcher Gartner Inc. "Right now, DeFi is run by centralized companies. But the difference is you can't stop the protocols. You can arrest the people, the regulators can put them in jail, but you can't stop the protocols."

There are environmental concerns about the huge amount of computing power some blockchains require, though newer systems may ease that. And with much of the code created in all-nighters, software bugs and malicious hacking attacks abound. Many projects don't even list contact numbers, though they may maintain online chat groups. If you accidentally mistype and send money to the wrong account, it may be lost forever. You won't be able to resolve the problem like you would by calling a bank's customer service line.

Many Web3 ventures have few paying customers but can gain from the appreciation of the underlying token, making them vulnerable to a wild market. Take Piknik & Co., which employs about 30 people and operates two data centers supporting Filecoin. It makes money generating FIL tokens, which have almost doubled in value this year. But they're down 82% since the April peak. CEO Kevin Huynh says he has customers in pilot programs who will eventually start paying him. He's made a big bet on Web3. He trained as a surgeon before diving into Piknik, and liquidated his 401(k) and gathered small contributions from about 70 relatives and friends to get started. "I think it's going places," he says. *—Olga Kharif*

THE BOTTOM LINE To Web3 boosters, crypto could change how software and companies work. But it also makes it hard sometimes to say who's in charge.

A Special Index, Just for You

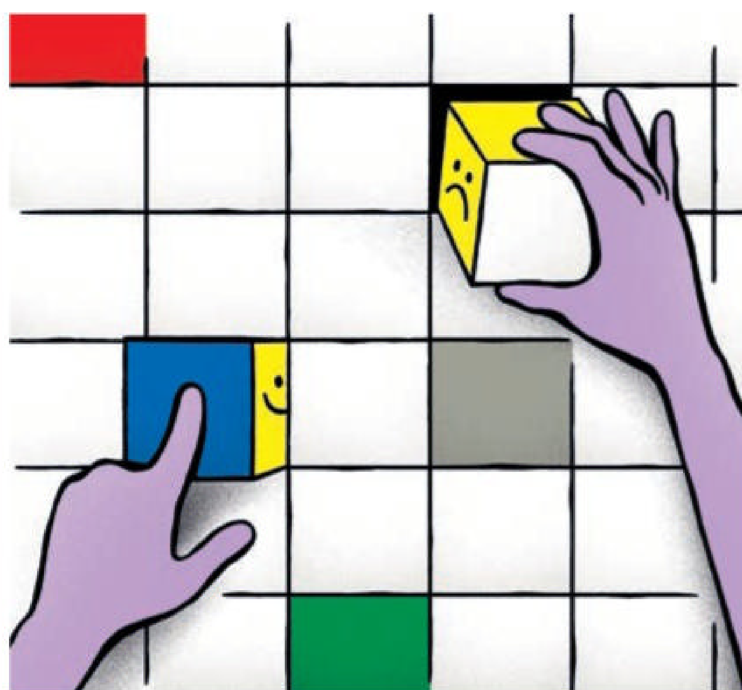
● Wall Street is betting that custom portfolios can challenge the dominance of ETFs

It's the existential challenge faced by asset managers all over Wall Street: Surrender to the fee-killing exchange-traded fund boom—or keep bleeding assets and risk extinction. Now they believe they've hit on a way to fight back.

Investment giants are lavishing billions of dollars on a bet that they can return their personal touch to an investing world now dominated by mass-market index funds. They include Morgan Stanley and even dominant ETF and index players BlackRock and Vanguard Group. They're all racing to offer software that can create a unique index for every investor and let them buy all the shares in it directly. The result? A mashup of active and passive investing that's supposed to offer the best features of both.

These products come with dull-sounding labels such as "custom indexing" or "direct indexing" that belie the radical potential of the approach—a kind of Spotify for investing that allows people to mix their own fund. "Custom indexing really is the thing that's going to drive the future of asset management," says Patrick O'Shaughnessy, whose then-$6.4 billion firm was scooped up in September by Franklin Resources Inc., the fund manager better known as Franklin Templeton, as part of the trend. "It's our responsibility to let people make their own choices."

To critics, the custom approach is an attempt



to rebrand active investing just to extract fees higher than most ETFs charge. But to the likes of O'Shaughnessy, it's helping investors take back control of their investments from index-following robots that sink their cash into companies on autopilot.

One of the things that made O'Shaughnessy Asset Management (OSAM) attractive to Franklin Templeton is a custom-indexing platform named Canvas. Launched in late 2019, it had already ballooned to $1.8 billion in assets by the time of the acquisition. Canvas is aimed at financial advisers, ▶

◀ who can use it to create individualized portfolios for clients. That's something the wealth management industry has always offered, of course—but usually only for the rich. An individual investor could open a brokerage account and assemble shares in maybe a few dozen companies, but achieving the diversification of an index by buying hundreds of stocks would have required a huge outlay with crushing commissions. Now a mix of dirt-cheap trading, powerful software, and the ability to buy fractions of shares is making the strategy available to a lot more investors.

There are two big selling points to customization. First, investors can ditch companies they don't like and add ones they do. So if a client works in tech and wants to trim her stock exposure to the sector so her career and portfolio aren't subject to the same risks, she can do that. If she dislikes fossil fuel companies, she can have broad exposure to the S&P 500 but nix Exxon Mobil Corp.

Selling losing stocks to offset a capital-gains tax bill may be an even bigger draw. A 2020 paper estimated that a strategy of well-timed tax-loss harvesting could help a U.S. investor's portfolio beat a benchmark by about 1 percentage point—a significant boost when compounded over time.

Direct indexing and custom indexing aren't exactly the same thing. With direct indexing, investors often start with an established benchmark, such as the S&P 500. But instead of buying shares of a fund that holds all the stocks in the index, they buy its individual members directly. Then they can tweak it to create their own versions of the benchmark. Morgan Stanley and Oliver Wyman estimated in a report this year that direct-indexing assets could reach $1.5 trillion in 2025 by seizing market share from mutual funds and ETFs, compared with $350 billion last year and $100 billion in 2015.

That's why, in May 2020, Charles Schwab Corp. acquired the technology of a firm called Motif that offered direct indexing. Then Morgan Stanley spent $7 billion on Eaton Vance Corp., which owned Parametric Portfolio Associates—one of the heavyweights in the investing style. Shortly after that deal, BlackRock Inc. announced it was buying Aperio, a creator of tailored index strategies, for $1 billion. Vanguard Group Inc. added direct indexer Just Invest in July—the first acquisition in its 46-year history. Automated online wealth manager Wealthfront Corp. provides direct indexing for some investors. (Bloomberg LP, which publishes *Bloomberg Businessweek*, sells market indexes and portfolio analysis technology for the investment industry.)

At OSAM, Canvas is called custom indexing, rather than direct indexing. While clients can build portfolios based on an existing index, Canvas's pitch is that they don't necessarily have to. "The name was all about the idea it's a blank canvas, and the adviser and the client get to paint their own picture exactly as they want, not something that's off the shelf," O'Shaughnessy says.

It's easy to see why Wall Street loves tailored offerings of all stripes. For brokers and market makers, it fuels more trading. For asset managers, it's a case to charge an average 0.3% of assets per year compared with 0.1% for ETFs, Bloomberg Intelligence estimates. For financial advisers, offering access to these programs is the latest way to preserve their 1% fee.

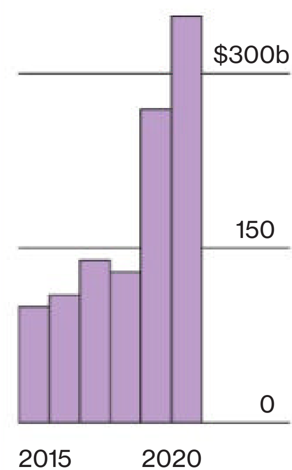
Skeptics warn the whole thing is a costly throwback for investors. After all, the evidence that active stockpicking can't consistently beat the market is overwhelming. If even the pros can't beat a benchmark, why would an individual do any better? "Every paper, every study in the world suggests people should not be involved in investing," says Wes Gray at Alpha Architect, which offers ETFs as well as a direct-indexing service. He says the idea makes sense for a niche group of investors with specific needs, but doubts it will be helpful for most. "All these tools are going to empower the worst behavioral decisions," he says.

And even that tax-loss harvesting strategy isn't always great. It's not necessary in tax-advantaged retirement accounts, where individual investors hold much of their wealth. And selling to offset tax incurs higher trading costs and causes deviations from the benchmark that will persist for at least a month, since U.S. wash-sale rules ban investors from buying back a security within 30 days. Meanwhile, for the tactic to be worth it, there must be a capital gain that needs offsetting. "There's a pretty good argument that the costs and frictions are way higher than people think," says Gray. "In 99% of the cases, I cannot justify doing it."

Whatever the strategy's shortcomings, the string of mergers and acquisitions is a measure of just how fast custom indexing could grow, according to Michael Kitces, head of planning strategy at Buckingham Wealth Partners, which works with financial advisers. He says it could rapidly become a threat to ETFs and mutual funds, and he likens the change to the last major industry shift. "That was the same story advisers had 15 years ago, when the early players were recommending ETFs when everyone was still using mutual funds," Kitces says. "When the industry decides to eat itself, change happens a whole lot faster." —*Justina Lee*

THE BOTTOM LINE Direct indexing might help certain investors save on taxes or adjust their portfolios for personal circumstances. But it's also more expensive than plain-vanilla ETF investing.

▼ Estimated assets in direct indexing



DATA: OLIVER WYMAN, ESTIMATES BASED ON ASSETS AT KEY DIRECT INDEXING PROVIDERS

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A Global Urge to Lie Flat

● Burned-out millennials and Gen Zers are quitting their jobs by the millions

Around the world, millions of people are rethinking how they work and live—and how to better balance the two.

The Great Resignation has U.S. workers quitting their jobs in record numbers—more than 24 million did so from April to September this year—and many are staying out of the labor force. Germany, Japan, and other wealthy nations are seeing shades of the same trend.

The pandemic has taken a toll, with surveys showing an increase in feelings of burnout and a deterioration in mental health in many nations. But the pressure has been building for decades. Incomes have stagnated; job security has become precarious; and the costs of housing and education have soared, leaving fewer young people able to build a financially stable life.

Although the Great Resignation is a phenomenon among those who are younger than 40, it's also reverberating across the economy and forcing a broader conversation about work. Millennials (born between 1980 and the late '90s) and Generation Z (the demographic cohort after them) tend to marry, buy houses, and have children later than their forebears—if at all.

China's "lie flat" movement, jump-started by a

ILLUSTRATION BY CHRIS NOSENZO

Edited by Alyssa McDonald and Cristina Lindblad

social media post from which it got its name, is also about opting out. It's a reaction against a system in which a grueling "996" work schedule—9 a.m. to 9 p.m., six days a week—is common at tech companies and in other industries. So is unrelenting pressure from family, society, and even the government to keep climbing the ladder.

While the country's economy has doubled in size over the past decade, not everybody is reaping the benefits: In many big cities the rising cost of living is outstripping wage growth. As a result, some see the lie flat phenomenon as a warning of impending Japan-style stagnation—one that's arrived unexpectedly early in the economy's development. Others argue it's more of the 1960s-style counterculture movements that cropped up in the U.S. and parts of western Europe, with ordinary people seeking a lower-pressure society that's more focused on personal development.

"It's basically a coincidence that these two discourses emerged at the same time," says Xiang Biao, director of the Max Planck Institute for Social Anthropology in Germany. "But we can make a connection. It's about how the economy has become overheated and unsustainable, both in an environmental sense and in a mental sense."

Almost half of the world's workers are considering quitting, according to a Microsoft Corp. survey. About 4 in 10 millennial and Gen Z respondents say they'd leave their job if asked to come back to the office full time, a global survey by Qualtrics International Inc. found—more than any other generation.

Some among older generations have criticized these attitudes as privileged and lazy. But the reality is that working hours have been dropping in richer countries for decades across all age brackets.

In China, what started as a witty expression of youthful rebellion has become a movement that even Xi Jinping has acknowledged. In a speech in August, the president urged the country to "avoid involution and lying flat" and instead "open channels for upward mobility."

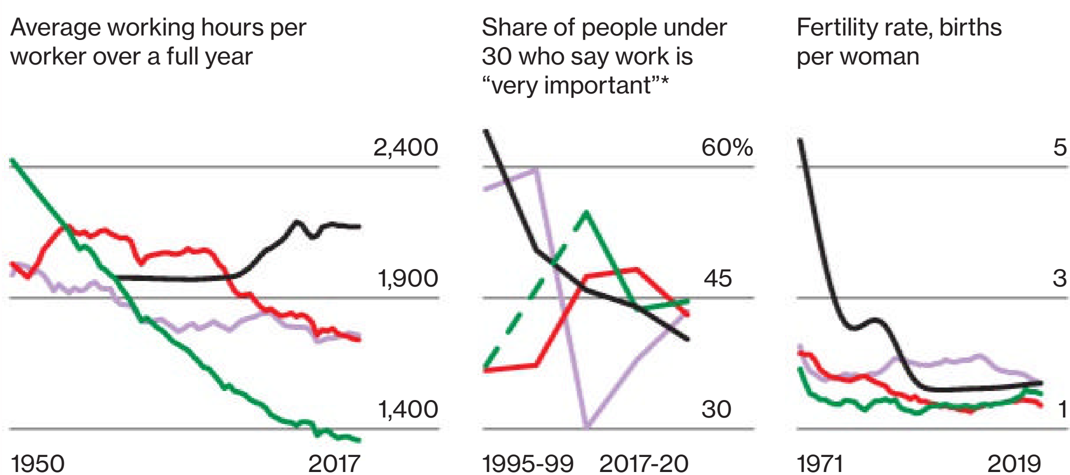
"I haven't been working for two years, and I don't see anything wrong with this," read the April post on the Baidu Tieba platform that sent lie flat viral. "Pressure mainly comes from comparisons with your peers and the values of the older generations. But we don't have to follow them." The poster, who went by the name Kind-Hearted Traveler, drew a comparison to the ancient Greek philosopher Diogenes, an ascetic who lived in a barrel: "Lying flat is my philosophical movement."

The movement's spiritual home may be Shenzhen, the booming technology hub in southeastern China that's home to 18 million people, many of whom have moved there from other parts of the country to work at giant electronics factories or at companies such as Huawei Technologies Co. and Tencent Holdings Ltd.

Jack, a 32-year-old tech worker who gave only one name for fear of reprisal from his employer, was full of ambition when a telecommunications company hired him five years ago. But a punishing workload failed to translate into the success he'd hoped for, and over time his enthusiasm drained away. He's still working, but not as hard. "Many internet industries have reached a stage where there is no explosive growth," he says. "But all the heavy work is still here. All the stress is still here. You lose hope."

That Shenzhen is among the world's least affordable cities adds to his woes. "Even for well-paid professionals like me and my girlfriend, it's still crazy," he says. "The down payment for a flat in Shenzhen is 2, 3 million yuan [about $315,000 to $473,000]. That's like both our savings, plus very huge help from our parents."

The Search for Work-Life Balance



*2000-04 DATA NOT AVAILABLE FOR GERMANY. DATA: HUBERMAN & MINNS (2007) AND PENN WORLD TABLE, COMPILED BY OUR WORLD IN DATA; WORLD VALUES SURVEY; WORLD BANK

In October thousands of employees at companies including Alibaba Group Holding Ltd. and TikTok owner ByteDance Ltd. participated in an online campaign branded "Worker Lives Matter" by posting information on when they start and end their workdays on a public spreadsheet. ByteDance has since mandated a shorter workweek.

In memes and online posts, younger Chinese people call their generation "mouse people" and "salted fish." (In Cantonese a salted fish is a metaphor for a corpse, but it can also mean people lacking ambition or drive.) If such attitudes become pervasive, they could accelerate population ▶

◀ When his bartending job evaporated, Mann devoted himself to painting

◀ decline: China's birthrate dropped to a record low in 2020, a major concern because the labor force is already shrinking.

At the Sanhe employment exchange in the north of Shenzhen, dozens of recent arrivals from other parts of China gather to browse job postings. While the country's migrant workers were once celebrated for their industriousness, these men and women have developed a reputation for whiling away their time playing online games or streaming TV, picking up day jobs only when they need money to pay their phone bill or rent. Shunning longer-term work and factory jobs in favor of less demanding service roles, they sum up their lifestyle in a simple mantra: "Work for a day, have fun for three."

On a recent morning, Mr. Li, a 32-year-old from Shaanxi province who declined to give his full name, surveyed the market's bulletin board with little enthusiasm. When a recruiter approached with a smartphone video from a factory seeking workers, Li rejected the job as soon as he saw it involved operating heavy machinery.

Li's attitude suggests the lie flat movement may be a symptom of a new stage in China's economic development: As a nation gets richer, its workers can afford to be more choosy. In the U.S. and Europe, the formation of a large middle class was key to the rise of 1960s counterculture and, later, the so-called slacker generation of the '90s.

In the U.S. the financial anxieties of millennials long predate Covid-19. Because of the combination of an explosion in student debt and the plodding recovery from the Great Recession, this generation is likely to be the first in U.S. history to be less wealthy than their parents.

The pandemic appears to have brought these concerns to a head. Two-thirds of millennials who left their jobs in 2021 cited mental health reasons, according to a Mind Share Partners survey, and the proportion for Gen Z was even higher, at 81%.

In July 2020 the federal agency in Washington, D.C., where Ben Anderson worked summoned its staff back to the office without supplying safety equipment or making accommodations for social distancing. After a colleague became a Covid long-hauler, Anderson began to wonder whether a steady job was the key to security and a good life after all. "As the world collapsed, I don't think they gave a shit about me," the 29-year-old says.

Quitting had been on his mind for a few years already. He'd earned top grades in college, relocated to a big city for work, and spent seven years in a full-time, white-collar job. Yet he still couldn't save enough to buy a home. "Work was crazy stressful, and I was far from my family," he says. "And at a certain point it was like, 'For what?' I was working in a gigantic bureaucracy in which you don't effect change. It's not built for that. I just got jaded."

He's now living in Los Angeles and acting in television shows and commercials. "I have as much chance in something as insane as Hollywood as running the gantlet at a government job," he says.

Although the Great Resignation is often thought of as a youth movement, at least one study shows employees from age 30 to 45 are also quitting at high rates.

Nate Mann, who at 40 is among the oldest millennials, spent almost half his life as a bartender in Washington, D.C. He put up with late nights and high stress in return for about $80,000 a year. But when Covid closed the bar at which he worked in March 2020, he decided to focus on something he'd been doing on the side for a while: painting. "I all of a sudden had all this time, so I just hunkered down and focused on the art," he says.

"People have felt their power now. They won't be embarrassed to advocate for themselves or tell the people: 'No. I'm not going to do that'"

Mann was one of the many who used money he'd saved over the years to facilitate his reinvention. The U.S. personal savings rate skyrocketed during the pandemic thanks to enhanced unemployment benefits and stimulus checks. He says many of his friends are also shifting out of poorly paid or unfulfilling jobs. "People have felt their power now," he says. "They won't be embarrassed to advocate for themselves or tell the people: 'No. I'm not going to do that.'"

In Japan the conversations taking place in China and the U.S. about how to balance work

MANN: DEE DWYER/BLOOMBERG. KULA: JACOBIA DAHM/BLOOMBERG

and other pursuits sound familiar. In the 1990s the media painted an unflattering portrait of youthful "freeters" who rejected Japan's demanding office culture, with its rigid hierarchies and 15-hour workdays, in favor of working odd jobs. But the young people said their lifestyle had been forced on them by a stagnant economy and a deregulation of the labor market that resulted in fewer salaried positions and more job insecurity.

By 2010 freeters had acquired a less disparaging label as part of a bigger phenomenon—the "satori generation"—referring to a state of enlightenment in Japanese Buddhism achieved by giving up material desires. Kairu Taira, 22, works for a consumer-goods company in Kobe and runs a satori generation blog. He's embraced minimalism, with a limited wardrobe that includes only four T-shirts and four long-sleeved shirts.

Taira says the satori generation gets blamed for "not helping the economy enough," because they spend so little. "But I think each of us is more able to see what's really important in life," he says. "In that sense, I like the term."

The growing acceptance of the satori generation may reflect that lower growth rates and less stable employment are here to stay. The number of newborns in Japan, already in decline for decades, fell to a record low in 2020.

"With freeters there was a lot more shame, fear, and anger being expressed," says Robin O'Day, a professor at the University of North Georgia who studies Japanese youth culture. "Now it seems that there's nothing that can be done."

Even in more welfare-minded Europe, where employment retention programs prevented pandemic layoffs on the scale seen in the U.S., many people are rethinking their careers. Across the euro area about 2 million fewer people are in employment than before the coronavirus struck.

Milena Kula, 26, says she was "relieved" when her contract at a politics-focused nonprofit organization in Berlin expired in April 2020. "I hated working a desk job," she says. "The best part of my day was my 45-minute cycle to work."

She now lives in the Brandenburg countryside, where she plans to set up a communal space for people who, like her, want to live in a more environmentally sustainable way. The idea is not to drop out of society, but to help create one that they believe in, she says. "I needed a different approach to how I was doing things, and to be free from manipulation to create the life I want."

Often what's portrayed as a change in young people's attitudes is simply a manifestation of longer-term trends, says Bobby Duffy, director of the Policy Institute at King's College London, whose book *The Generation Myth* challenges stereotypes around generational shifts. Many people in their 20s and 30s seek different things from work than their older peers, such as prioritizing learning new skills over stability, Duffy says, but older cohorts held broadly similar views when they were young.

Benjamin Granger, head of employee experience advisory services at Qualtrics, believes we're in fact witnessing a momentous shift in attitudes. "People are looking at work through a very different lens. The lens is things like, 'I am not working for a paycheck. That's not what this is about. I need to be fulfilled.' "

In China the shift may prove to be even more fundamental. With growth slowing, the Communist Party is putting more emphasis on how economic gains are distributed. Recent policies aimed at improving conditions for gig workers and moderating housing and education costs aim to support a better quality of life—and may help defuse the lie flat phenomenon.

▲ Kula was "relieved" when her work contract wasn't renewed

If these preoccupations about the value of work persist, they may—in time—influence the course of economies. "Lying flat and the Great Resignation are raising difficult questions, without making specific demands for change. This is good momentum," says Xiang of the Max Planck Institute. "This can be energy to push for new growth paradigms." —*Tom Hancock, Katia Dmitrieva, Carolynn Look, and Yuko Takeo, with Allen Wan and Amanda Wang*

THE BOTTOM LINE From Beijing to Berlin, frustrated young people are ditching jobs that are unfulfilling, even if it means their lives are more precarious.

An Election Of Extremes

Polar opposites are vying for Chile's presidency as social change intensifies, upending politics as usual

One candidate is a 55-year-old father of nine, a strict Roman Catholic and free-market absolutist who praises the dictatorship of Augusto Pinochet. The other is two decades younger, bearded, tattooed, and unmarried—a leftist out to battle inequality, aid indigenous communities, squeeze big mining, and make abortion legal and free.

On Dec. 19, either rightist José Antonio Kast or leftist Gabriel Boric will be elected president of Chile and take the world's biggest copper producer, a darling of international investors, down a path the other's supporters will vehemently oppose. No matter who triumphs—early polls give the edge to Boric, a member of the lower house of Chile's Congress—a country once seen as a model of neoliberal triumph is headed for rocky times.

This was, until recently, entirely unexpected. For three decades, Chile, a nation of 19 million, seemed to defy gravity, overcoming a violent past by slashing poverty, attracting investment, and enjoying a stock market boom. Political moderation was crucial to cementing its reputation as the region's best place to do business.

The starkly polarized race coincides with the rewriting of the country's constitution, which voters will accept or reject in a referendum next year, as well as a reassessment of the norms that have defined Chile's traditional, Catholic society for decades. On Dec. 7 the legislature legalized marriage equality after President Sebastián Piñera shocked allies by fast-tracking a bill that had languished since 2017. Neighbors such as Argentina and Brazil have recognized same-sex marriage for years, but Chile had lagged behind.

● Boric

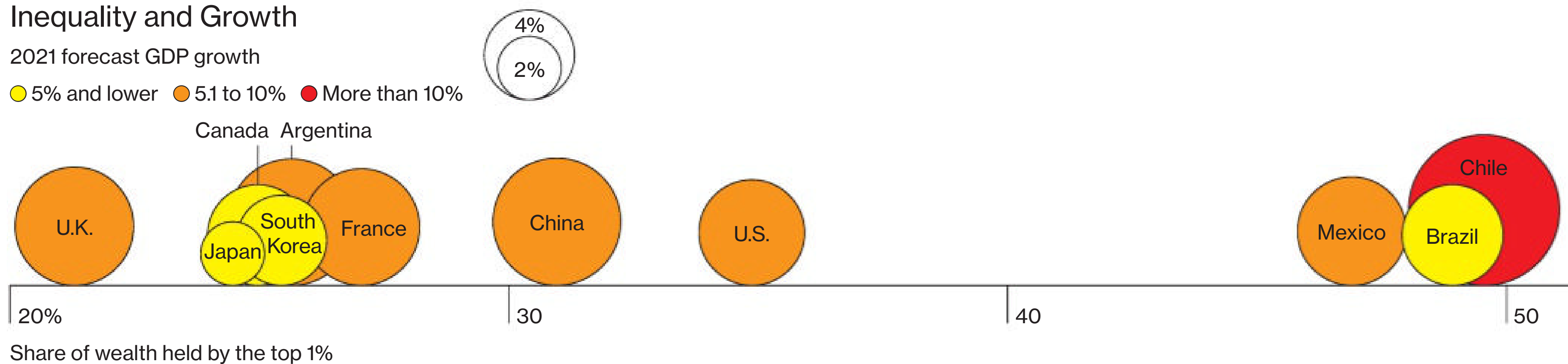
There are also challenges to the foundations of the nation's free-market economic model. Since the start of the pandemic, the National Congress has approved three rounds of early withdrawals from individuals' pensions, draining $47 billion from the private pension funds that are Chile's biggest institutional investor and a bedrock of the country's financial markets. Although they hurt local capital markets, the drawdowns proved popular among workers who'd been denied early access to their savings because of cumbersome rules.

"We are ending a cycle with a democratic and economic model that gave Chile a lot of stability but also left certain problems unresolved," says Pamela Figueroa, a political scientist at the University of Santiago. "Chile's institutions are trying to absorb and incorporate all the social changes that the country is experiencing. This is happening at the same time as the pandemic, which exacerbated the problems that existed before."

How did a country that eschews political drama wind up with a surplus of it? A tiny increase in public-transit fares brought tens of thousands of Chileans

BORIC: MARTIN BERNETTI/AFP/GETTY IMAGES. KAST: IVAN ALVARADO/REUTERS

Edited by Amanda Kolson Hurley



into the streets in 2019, angered by wide inequality that the coronavirus has since made worse. Calls for a new constitution led to a plebiscite in October 2020 and the election in May of a constitutional assembly that vows to curb the power of the moneyed elite. And the emergence in August of Boric, a former student leader, as likely to take over from moderate conservative Piñera alarmed investors.

The combination of street violence over two years of social unrest, left-wing rhetoric from Boric's coalition, and fear of economic decline then shifted attention to Kast, who offers himself as the brakes on a runaway train of change. The election will not only determine the next steps in Chile but also set a tone that neighbors, including Colombia and Brazil, will be listening to closely.

Not all proposals involving dramatic shifts are prospering, which suggests there are limits to Chile's transformation. A bill that would have decriminalized abortion through the 14th week of gestation was voted down in the lower house of Congress in late November, disappointing women's rights organizations. A proposal for a fourth round of pension withdrawals was rejected this month.

There are also signs that moderation is starting to matter in the presidential contest. Both Boric and Kast are wooing backers of other candidates who competed in November's first-round vote, including Franco Parisi, who campaigned entirely via social networks from his residence in Alabama and nevertheless finished in third place. Kast has said his economic plans are "not set in stone," while Boric recently met with members of an influential business association and has emphasized that any changes made during his tenure would be gradual.

"What I'm seeing now is that both sides are trying to move to the center, which is good news for our economy and society," Rodrigo Cerda, Chile's finance minister, said in a Dec. 3 interview on Bloomberg Television. "People are looking for the center votes, and we will be looking for more moderation."

Kast and Boric remain far apart on how to address challenges such as slowing economic growth and gaping social disparities. For Boric, the solution lies in granting a larger role to the government by raising taxes on corporations and the rich to fund better public services. Kast says law and order is the top priority, and he promises to boost growth with a combination of stability and tax cuts.

Chile's next president will face a growing list of economic and social challenges. Temporary cash transfers and early pension withdrawals prompted a frenzy of consumption but also drove annual inflation to the highest rate in over a decade, prompting aggressive interest-rate increases that may extend into 2022.

● Kast

Chile's economy is forecast to surge around 11% this year, and Cerda said emergency measures implemented during the pandemic and leftover liquidity will still allow for growth of 3% to 4% in 2022. Still, private-sector economists from banks including JPMorgan Chase & Co. and Banco de Crédito e Inversiones have a much more dour outlook, arguing that the combination of greatly reduced stimulus, higher borrowing costs, and political uncertainty will lead to recession later in 2022. ▶

● Total early withdrawals from Chilean private pensions during the pandemic

$47b

◀ There will also be no way around the threat of further unrest, as evidenced by recent violent protests that marked the two-year anniversary of the start of Chile's social uprising. In another sign of discontent, voters have rejected the political coalitions that have governed the country since the end of the Pinochet regime. Despite support from traditional parties ahead of November's first round, former Social Development Minister Sebastián Sichel and Senator Yasna Provoste placed fourth and fifth, respectively.

There's a strong perception that the ruling class has failed to make changes that the population demands, according to Claudia Heiss, the head of political science at the Institute of Public Affairs at the University of Chile. The frustration discredited centrist presidential options who were more moderate and also open to dialogue, she says. "The biggest challenge is how to mend the political system overall," Heiss says. "It's a structural problem that won't be solved by the Constitutional Assembly, the winner of the presidential runoff, or any short-term measure. It doesn't have a quick solution." *—Matthew Malinowski and Ethan Bronner*

THE BOTTOM LINE With the sharply polarized presidential race, a new constitution in the works, and simmering discontent over inequality, once-stable Chilean politics are in a ferment.

City Halls Embrace Zoom, Insults and All

● Some U.S. localities want to keep public meetings virtually accessible after the pandemic

When Washington, D.C., reenfranchised people serving time for felonies in 2020, Joel Castón, then at the D.C. Central Detention Facility, realized that not only could he now vote, he could also run for commissioner of his local Advisory Neighborhood Commission, one of about 40 of the hyperlocal governing bodies in the district. And if he could find a way to participate in ANC meetings from jail, he could serve out his term in office.

Luckily for him, Castón's run—and subsequent win—took place in 2021, a year into a pandemic when most government bodies were already meeting online from home, wherever that was. "The online work has actually played in my advantage, not being able to physically put boots on the ground, due to my incarceration," he said in a Zoom interview with *Bloomberg Businessweek* earlier this year. His tiny ANC district never had a commissioner represent it before, much less one who was jailed. (Castón, who was convicted of murder at age 18, was released on parole last month after 26 years of incarceration.)

The option to call into government meetings and the concept of livestreaming them predate the pandemic. But the norm was to gather at city hall or a similar central location right after traditional work hours—a format that favored those who had the time, flexible child-care responsibilities, and will to show up. Now, as many cities plan to return to in-person meetings, the District of Columbia is one of a number of U.S. jurisdictions that's trying to preserve some of the benefits of virtual civic engagement.

After a slow, glitchy start, remote city meetings brought municipal governance a newfound element of hilarity (cat and kid cameos, Zoom bombings by "nude hackers") and transparency (unmuted official infighting, living room views). They allowed public outcries over everything from Covid-19 policies to police brutality to travel far beyond the cities where they originated. (A seven-hour Los Angeles Police Commission Zoom marathon that went viral immortalized the infamous line, spat at the police chief: "I yield my time, f--- you!") More significantly, they removed some of the barriers associated with participating in traditionally analog forms of civic discourse.

Research published in 2019 by Katherine Levine Einstein and other political scientists at Boston University showed that participants in zoning

"To get new results, we have to do new things. It's a paradigm shift"

and planning meetings in Massachusetts localities skewed toward White, older property owners. When their priorities were represented in the meetings, their priorities shaped policies.

In the District of Columbia, Erin Palmer, an ANC representative, says she saw limitations to in-person meetings, too. "The one primary trend that I observed was that it's the same people who came every time, relatively speaking," she says. When things moved online in April 2020, she saw more parents logging in. Together with 100 other ANC reps, she signed a letter urging the city to allow a continued hybrid approach. "There are any number of issues that might make the virtual option more of a necessity again in the future," Palmer says.

Last year, California lawmakers introduced three bills that would have extended localities' ability to continue conducting business remotely after the governor's emergency order lapsed on Sept. 30, 2021, though only one became law. Amendments and revisions limited its scope to allow essential local agencies to meet remotely until the end of 2023 under certain conditions. To complicate things further, the local bodies have to vote to use or renew the exemption.

The bill is "really focusing in on the worst-case scenarios, should the pandemic take a turn for the worse, which we hope it doesn't," says California State Assembly Member Robert Rivas, who introduced the bill. But he wouldn't preclude the possibility of trying to pass more sweeping legislation in the next session.

In California and elsewhere, some cities that thought they were ready to return to in-person meetings have reversed course. What a local CBS outlet described as "outbursts and boos and a defiance in mask-wearing" at Los Gatos, Calif.'s council meetings sent them back to cyberspace in October. In Newark, Del., the delta variant shut down in-person meetings in August, just three weeks after they had resumed.

Critics of continued remote participation maintain that the system will create new costs for audio and visual equipment and prolong technical and cybersecurity challenges. Among participants, high-speed internet access remains a persistent inequity, and not all meetings are able to offer translations for non-English speakers or those who are hard of hearing.

Some realms of virtual governance saw a less significant shift in participation. At Massachusetts planning and zoning meetings, the switch to virtual had little effect on who showed up and spoke, according to a follow-up paper by Einstein and her colleagues. They looked at zoning and planning meetings from March to September 2020 in the same cities and towns they'd observed for their original research–and found that it was still the usual suspects who chimed in the most.

"Basically nothing changed about these meetings," says Einstein. "They skewed towards homeowners, and they skewed towards White people. And they also really strongly skewed towards the opponents of the construction of new housing." (They also skewed older, showing that age doesn't necessarily translate into tech illiteracy.)

Einstein says these findings don't mean virtual meetings aren't worthy–it's just a reminder that removing a few barriers isn't the same as actively engaging people in the political process.

Warren Logan, who until recently served as policy director of mobility and interagency relations in Oakland, Calif.'s mayor's office, stresses that Covid itself was an important variable in how online participation played out. Zoom fatigue may have deterred people from signing into yet another online meeting. Anxiety and stress could have sapped people's energy for politics entirely. And many essential workers didn't gain any newfound flexibility to log on from home.

ILLUSTRATION BY ALBERTO PAZZI

In the Zoom interview, Castón said he'd rather meet his neighbors face to face. But "to get new results, we have to do new things. It's a paradigm shift." Allowing incarcerated people into the civic process means "you will have a different person return back to society," added Castón, who started a newspaper and mentorship program behind bars. "One who has a mindset of what it means to be a citizen." *—Sarah Holder*

THE BOTTOM LINE Virtual meetings remove barriers to access like needing to find child care. But research suggests the same voices as before might remain the loudest at some civic meetings.

BIG IDEAS FROM THE BIG TOP

● In an excerpt from his new book, Daniel Lamarre of Cirque du Soleil talks about creativity

People began bursting into my Montreal office, one after another, with bad news—another city locked down, another show canceled, another border closed. We held emergency meetings, but every decision was outdated by the time the meeting was over. Soon came word that the big casino resorts hosting our long-running Las Vegas shows—*O*, *Mystère*, *The Beatles Love*, *KÀ*, *Michael Jackson One*—were closing indefinitely. With the NBA and Broadway shows already dark, the entire live entertainment industry was being felled by a virus.

In less than a week, our company had to cancel all 44 shows around the world, and revenue plunged from $1 billion a year to zero. The global pandemic of March 2020 had left us, quite literally, without a business. Bankruptcy protection seemed inevitable. As chief executive officer, I knew I had to stay calm. At this terrifying moment, I would need every ounce of tenacity I could muster to save our beloved company.

Today, the sun rises. Cirque du Soleil's spectacular productions have returned to stages in the U.S. and abroad. Our creditors—seeing the enormous value in our creative output—acquired us in November 2020 by absorbing our debt and investing an additional $375 million.

When the pandemic struck, I was writing a book about creativity in business that made me think long and hard about why our company became so successful after its humble beginnings in 1984 as a ragtag group of local street performers and what companies in other industries might learn from our experience.

During my 21 years at the company, we have expanded by leaps and bounds, with our touring shows reaching 450 cities in over 90 countries. Overall, more than 365 million spectators have seen our productions, and our 15 million tickets sold in 2019 were more than all Broadway shows combined.

Edited by Rebecca Penty and David Rocks

How did we achieve such astounding growth? I kept coming back to one word: creativity. By that I mean the standard dictionary definition of "making or bringing into existence something new." Which raises the question: How can a company reach the cutting edge and stay there?

First, forget the traditional pyramid structure. That tends to stifle experimentation. We found that employees need smaller, more intimate groups, or "innovation cells," to express themselves openly and play around with new ideas. That's why we were able to grow so large without compromising quality. We don't act like a big company.

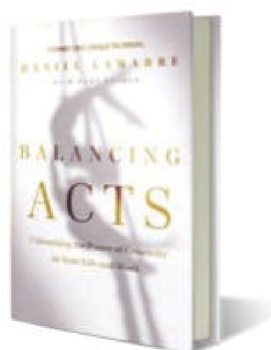
To maintain our creative edge, we have several cells devoted exclusively to research and development. Our trends group has three full-time employees who search the world for new ideas and talent in music, fashion, architecture, theater, film, games, and more. A larger research department, called Nextasy, selects a few major projects per year to focus on, including new stage technologies and biomechanical breakthroughs that reduce performer injuries. One exciting innovation, developed with Microsoft Corp., is a pair of augmented-reality smart glasses, called HoloLens, that allows our directors to visualize the entire stage before it's even built.

When Covid-19 hit, we had to quickly repatriate 1,500 cast and crew members stranded in 13 cities before national borders slammed shut. Then we had to find warehouses for almost 500 trucks full of stage equipment. But all that was nothing compared with the trauma of March 19, 2020, when we had to lay off 95% of our 5,000 employees without any idea of when we could rehire them.

During those bleak days, as we went through bankruptcy protection, I was astonished to get a series of calls from blue-chip investors. Despite our crippled state, they were attracted by the tremendous power of our brand and the value of our intellectual property. The winning bid by our creditors put our market value at a stunning $1.28 billion.

That improbable sequence of events illustrates, better than anything else I could say, why creativity is so crucial in business. Now that I've moved on from CEO to executive vice chairman of the board, I plan to travel widely to spread my message: Whether you are an executive, an entrepreneur, or a professional, if you aren't placing a high premium on creativity, you're wasting your time. No company deserves to exist unless it's constantly discovering ways to make its customers' lives better. Simply put, without creativity, there *is* no business.

► *Adapted from* Balancing Acts *by Daniel Lamarre. Copyright 2022 by Daniel Lamarre. Used by permission of HarperCollins Leadership.*



CRITICAL QUESTIONS

● **In establishing a creative culture, how you choose your projects and partners is crucial. Informally, we call our guidelines the Four Criteria, which can apply to any company or industry.**

❶ Is it a creative challenge?

Employee engagement is a huge problem because managers don't give workers enough reasons to get excited about their work. A creatively challenged staff is far more productive and works longer hours because they're so deeply engaged.

❷ Does our partner share our values?

Our greatest partner has been MGM Resorts International, which understands the creative process and has always supported our Las Vegas shows no matter how far-out our ideas or how expensive the theater construction. We've mistakenly worked with other resorts that had no interest in the artistic content of our shows. With our values out of alignment, we clashed constantly.

● Lamarre

❸ Can it make a profit?

Although making money is required, we don't consider it until the first two conditions are met. When we broke this rule—partnering with a casino resort that guaranteed us a profit in exchange for the prestige we conferred—it was a disaster. Nearly empty theaters damaged our morale and brand. We should have rejected this deal for the practical reason that our company has never been driven by a lust for money.

❹ Are our partners socially engaged?

If the answer is no, we introduce them to causes like Cirque du Monde, our nonprofit arm that helps at-risk youth. Once our new partners get involved, they are always glad they did.

OPPOSITE PAGE: ETHAN MILLER/GETTY IMAGES. BOOK: COURTESY HARPERCOLLINS. LAMARRE: ALAMY

INTERVIEW DATING

● Looking for work has become much like looking for love

Your coffee date doesn't show up, an exciting person ghosts you, everyone is flaky, and you feel like a piece of meat. You must be job hunting.

The dynamics of modern dating, ushered in by apps such as Tinder and Grindr, are moving into the labor market, where candidates and prospective employers now weigh dozens of humans at once and sometimes ghost the rejects. Dating and interviewing have always had their similarities, but the pandemic and labor shortages have moved the hiring process online, making the two more alike. Online hiring lets employers court candidates aggressively, even as those same candidates are booking 5 to 10 job interviews in a week, snagging the most enticing offers as they appear.

It may sound painful for both applicants and hirers, but it turns out that experience swiping left on a dating app is transferable into the world of work. "The jitters, stomach butterflies, clammy hands, and need to check your appearance and audio a hundred times while counting down minutes on the clock are much the same for a first online Zoom date or job interview," says Corissa Peterson, hiring manager at Resume Genius, an online resource for job seekers. "Eventually you learn that even if your date or interview goes horribly wrong, it will be over in an hour, and you'll never have to see what's-their-face again."

Daniel Hess, a filmmaker in Baltimore, was tossed into the job pool when the pandemic shut down the industry. He says his seven years on dating apps Bumble, Hinge, OkCupid, Plenty of Fish, and Tinder have helped him to quickly sense if an employment opportunity is going to be a good or bad fit. "It's taught me who I would work well with and who I wouldn't, and how to be pickier," he says. "I never would have guessed that dating was good preparation."

Shawn Laib, an insurance copywriter at AutoInsurance.org, says the six months he used Grindr and Tinder trained him to rely on his intuition and be more assertive. In dating, he says he's now able to see potential deal breakers early on—a skill that's also relevant for job hunting. "You need to catch red flags and ask more questions when you don't trust what's happening," he says.

Therapists agree that dating skills are applicable to finding a job or recruiting for a position. Screening other humans requires us to discern between what people say and do, says clinical psychologist Avigail Lev, director of the Bay Area CBT Center, which specializes in cognitive behavioral therapy. This process requires awareness of one's own values and the ability to determine whether they align with those of the person on the screen.

Here are three successful practices for hirers navigating a job market that sometimes feels like the dating world, according to Pearl Kasirye, head of PR at London-based search engine optimization company Pearl Lemon, who says she's used "all the dating apps": Thoroughly sleuth social media profiles and digital footprints for red flags; quickly schedule video calls to efficiently ascertain fit; and don't ghost. "I'm open and honest, because they are people, too," she says.

Applying simple laws of attraction is a surefire way to find hiring success, whether the interaction is online or in person, says Shaun Heng, vice president for growth and operations and chief of staff at crypto price-tracking site CoinMarketCap. "Let's say that you want to be hired or get a new significant other," he says. "If it's really clear that you're a catch, then you probably won't have to chase down what you want." —*Arianne Cohen*

A BETTER JOB BOARD

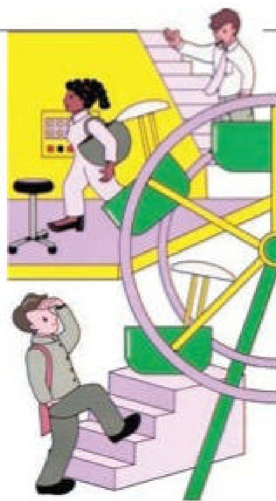
● Startups help match workers to positions inside the company

After five years as an engineer at IBM, Ben Reuveni started getting courted by recruiters, spurring him to seek a new challenge. He wasn't desperate to leave, but internally there was "silence," he recalls. "Exploring outside the company was much easier."

Reuveni eventually found a new gig inside Big Blue, but only because he knew the right people—which sparked an idea: Reinvent the corporate job board using an algorithm that matches workers to jobs. The idea was to help all employees, not only well-connected ones, discover career paths they'd never contemplated. And bosses could deploy the tool to quickly find people with the right skills for new assignments. In 2015, not long after getting his new job, Reuveni quit IBM and co-founded Gloat, one of a dozen or so talent-management startups seeking to make it easier for people to make a career move without joining what's come to be known as the Great Resignation.

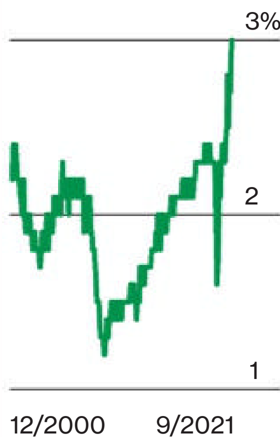
Many workers leave because they can't see a career path that doesn't involve quitting. Only 1 in 4 employees say their organization makes it easy for them to find job opportunities that match their interests, according to consultant Gartner Inc., and just 37% of bosses encourage their direct reports to explore other roles. Among people who are fed up with their job, almost half say it's because of a lack of advancement opportunities instead of reasons such as salary, a survey from staffing agency Robert Half found. "A lot of folks working at big, diversified corporations are not made to feel they could have different careers inside the company," says Melissa Swift, a consultant at workforce advisory firm Mercer. "Organizations haven't thought about this issue in a detailed way."

That's starting to change, fueled by rising rates of attrition that have affected companies from Wall Street banks to corner bistros. Six in 10 employers say they're struggling to retain staff, vs. only 15% who said so last year, according to consultant Willis Towers Watson. Instead of dangling huge sign-on bonuses, companies should spend more time "cooking with what's already in the kitchen," Swift says.



"We're empowering people to see all of what's out there, not just what's in their silo"

▼ Resignations as a share of total nonfarm unemployment, seasonally adjusted



Rising turnover has boosted growth at the likes of Gloat, Hitch, Eightfold AI, and Fuel50. They're not the first to use digital tools to keep tabs on workers. So-called human capital management software maker SuccessFactors, now part of SAP, has been around since 2001, and rival Workday Inc. was founded five years later. But those companies aim to manage all facets of human resources, whereas the newbies focus on careers, allowing employees to upload their résumé, LinkedIn profile, and other info about their skills and desires. The software spits out matches, and though clients say not every pairing makes sense, the algorithms get smarter over time. "There are so many invisible people with great ideas," says Kelley Steven-Waiss, who founded Hitch in 2019. "We need to make them visible."

Seagate Technology is trying to keep defections at bay as it shifts from selling hard drives to renting storage space in the cloud. Historically, finding a new internal job was "very much a manual approach," says human resources chief Patricia Frost, a U.S. Army veteran who recalls paging through personnel files by hand in her search for soldiers for the military's cybersecurity arm. At Seagate, departing staff often complain that they see no way forward, so in January, Frost made Gloat available to her 14,000 white-collar employees. She says it's helped keep attrition in check by matching someone with a new job inside the company every day, on average. "We're empowering people to see all of what's out there, not just what's in their silo," she says.

Lower-paid front-line staff, though, remain largely invisible on these newfangled job boards, which are geared toward knowledge workers. The matches are also useless without human intervention: Employees have to decide they want a new job, and the boss has to agree that the candidate fits the role, says Paddy Hull, a vice president of human resources at Unilever Plc. The British company understands that advanced algorithms aren't a panacea for those stuck in a rut, so it's using Gloat more for short-term projects. The software has made connections for more than 31,000 gigs across the globe, 70% of which include bringing together staffers from different areas, such as supply chain and sales. "Everyone wants to hold on to 'my people,'" Hull says. "That mindset needs to be blown apart." —*Matthew Boyle*

ILLUSTRATIONS BY EMMA ERICKSON. DATA: U.S. BUREAU OF LABOR STATISTICS

There are promising signs that a single vaccine could protect against multiple coronaviruses and variants. But with pharma companies invested in boosters, will anyone pay to develop it?

By Robert Langreth

The Swiss Army Vaccine

PHOTO ILLUSTRATION BY 731; PHOTO: ALAMY

As Covid-19 began spreading in early 2020, one of Linfa Wang's first ideas was to test the blood of people who'd survived a previous coronavirus outbreak. The virologist, who works out of Duke-NUS Medical School, a collaboration between Duke and the National University of Singapore, has been studying bat-borne viruses for decades. He'd helped show that SARS-CoV-1, which killed almost 800 people in 2003, likely jumped to humans from horseshoe bats. Wang's new theory was that people who'd recovered from the original SARS might harbor antibodies that could help fight the new one, SARS-CoV-2.

Initially, the experiment was a bust. The patients Wang tested had antibodies only against the older version of SARS. But as a number of Covid variants began spreading early this year, he decided to test the patients again. By this point, many of the Singaporean SARS survivors had also been vaccinated against Covid, providing a rare set of immune systems that had been exposed to proteins from these related coronaviruses.

What Wang found astonished him. After getting the Covid shot, the SARS patients had developed something akin to super-antibodies, which blocked both SARS viruses and a multitude of other coronaviruses. All eight patients had antibodies that, in test-tube experiments, neutralized five different bat and pangolin coronavirus strains that had never infected humans. The results, published in the *New England Journal of Medicine* in August, offered one of the strongest bodies of evidence that a universal coronavirus vaccine is possible.

The need is growing—as public health officials know all too well, three new coronavirus diseases have emerged in just 20 years: first SARS, then MERS in 2012, and now Covid. At his 13th-floor lab a few kilometers from Singapore's central business district, Wang is working on a prototype vaccine that could generate the same type of wide-ranging immune response he saw in the Covid-vaccinated SARS survivors. His regimen combines a first shot containing the Covid spike protein with a second shot containing a hybrid SARS protein. If it works—Wang says experiments in mice are promising—the vaccine could be deployed in the event of a Covid-26 or a SARS-3.

"We want something that is broadly protective, so that when the next one jumps from animals to humans, we already have a vaccine in hand," says Melanie Saville, head of vaccine research and development at the Coalition for Epidemic Preparedness Innovations, a global nonprofit based in Oslo. CEPI plans to spend $200 million to develop broad-acting coronavirus vaccines over the next five years. One of its first grants under the program was awarded in November to Israel's MigVax Ltd., a crowdfunded startup working on a "variant-proof" Covid vaccine in tablet form.

A broad-acting vaccine could provide a ready-to-use weapon against threats such as omicron, which has far more mutations than any previously identified variant and which researchers and governments are scrambling to understand and to develop boosters for. "After delta there is going to be something else, until we run out of Greek letters," University of Pennsylvania researcher Drew Weissman told me in the days before omicron was named. "By making a booster, you are always a step behind."

Weissman, who pioneered key technology used in both the Pfizer and Moderna messenger RNA vaccines, is among those working on pancoronavirus shots. Initially, such vaccines are likely to focus on fairly close relatives of Covid, but the more ambitious goal is protecting against a wide array of coronaviruses, including several strains that cause the common cold. Given the plethora of bat coronaviruses lurking in nature, there's every reason to expect more Covid-like epidemics. Future ones could be "as bad as or even worse than what we are going through right now," says Anthony Fauci, director of the U.S. National Institute of Allergy and Infectious Diseases and President Joe Biden's top medical adviser. "Rather than responding to the next outbreak, it is critical to develop a vaccine that would protect against all iterations of coronavirus."

In September, Fauci's agency announced $36.3 million in funding for research into pancoronavirus vaccines by scientists at Harvard, Duke, and the University of Wisconsin. More than a dozen academic teams, along with a handful of biotech companies, are working on the problem. Labs at Duke and a few other U.S. universities have already created prototypes demonstrating potent cross-virus immune responses in animals, including against SARS-CoV-1, SARS-CoV-2, and some related bat coronaviruses. The Walter Reed Army Institute of Research also has a shot that's shown promise against multiple coronaviruses: Its formulation is in a Phase 1 human trial, one of the first such shots to make it that far.

Important questions remain unanswered, such as which parts of the virus to target, which technology works best, and how broad-acting the shots should be. Pfizer Inc., Moderna Inc., and many other major Covid vaccine companies aren't investing heavily so far, instead waiting as the academic research plays out. Mikael Dolsten, chief scientific officer of Pfizer—which is researching an omicron booster and is developing ones for the beta and delta variants with its mRNA vaccine partner, BioNTech SE—says that, given that existing vaccines work and that mRNA shots can be quickly updated, it could be "a dangerous game" to switch tracks to a pancoronavirus shot. "We are following it, but it's more of an academic approach at the moment," Dolsten says. "I would say stay with what works." He posits, too, that waning effectiveness of vaccines over time could turn out to be a bigger problem than variants, something universal shots wouldn't necessarily solve.

Stéphane Bancel, chief executive officer of Moderna, which is also developing mRNA boosters against the beta, delta, and omicron variants, calls universal vaccines "a good idea" and says he'd be happy to strike partnerships to develop them when viable options emerge. But he cautions that researchers have been working on universal flu vaccines for years without a breakthrough.

It's true that scientists have long dreamed of developing a vaccine that would eliminate the need for an annual flu shot. There's been no breakthrough, though several trials are under way. The difficulty has been the pace of mutation: Influenza

evolves rapidly. The speed at which coronaviruses evolve is intensely debated, but the case for broad-acting shots is nonetheless compelling, given the promising results from early attempts, the increasing frequency with which coronaviruses have been crossing over from other species, and the staggering human and financial costs of Covid. "It would be crazy not to do something," says Pamela Bjorkman, a structural biologist at the California Institute of Technology who's working on a universal vaccine. "For the world to act like 'Wow, we have solved this' is really shortsighted."

The history of flu vaccines offers an object lesson. Early shots were pioneered in the 1940s by University of Michigan virologist Thomas Francis with help from the U.S. Army, which was worried about an epidemic ravaging troops in crowded barracks. Francis and his protégé, Jonas Salk, grew the vaccine in fertilized chicken eggs, a method still in wide use today. The first shots showed strong efficacy in many studies. One influenza B shot given to troops receiving specialized training at the university in 1945 proved 88% effective, not far from the 90%-plus efficacy reported for the mRNA Covid shots. The researchers quickly realized that strains could evolve from year to year, resulting in a mismatch between vaccine and virus. But they were optimistic it would be manageable. "The outlook for increasingly broad and effective prophylactic immunization against the range of influenza viruses is extremely promising," Francis concluded in a 1953 publication.

The early flu shots contained two viral strains, then three in the 1970s, and finally four in the past decade. Research focused heavily on attacking the most abundant protein found on a virus's surface, hemagglutinin, with flu shots selected each year based on their ability to generate antibodies against it. But for much of the vaccine's history, doctors couldn't accurately measure how shots were performing in the real world. After modern viral load tests—the same kind of PCR tests used to definitively diagnose Covid today—started being used in the 1990s, enabling researchers to study real-world flu vaccine performance more carefully, it slowly became clear that the results varied widely and topped out at middling. Since 2004, even as more of the U.S. population has been getting vaccinated annually in keeping with expanded government recommendations, the shot's real-world effectiveness has ranged between only 10% and 60%, according to the Centers for Disease Control and Prevention. Most years, it's around 40% to 50%.

Over the years researchers have come out with flu vaccines that use more modern, faster production methods, including a genetically engineered flu shot grown in insect cells, but there have been no breakthroughs in efficacy. Efforts to develop a universal vaccine that would work against all strains didn't seriously accelerate until after the H1N1 version of influenza swept the globe in 2009. They're still years away from fruition. "That's what I'm calling the mistake of the past," says Matthew Memoli, a respiratory disease researcher at the NIH. "We really didn't make any effort. We got comfortable and said we have a vaccine, it works OK." In May 2020, Memoli and two colleagues penned an essay in *NPJ Vaccines* calling for immediate research into universal coronavirus vaccines. "I don't want it to take 50 years to make the same decision," he says.

Covid vaccines employ more advanced technology than most flu shots, but like flu shots they've thus far focused largely on the most obvious target—in their case, the spike protein SARS-CoV-2 uses to get into cells. The mRNA vaccines cause the body to produce millions of copies of the protein, stimulating a potent immune response. That's obviously been a smart strategy, given the impressive efficacy shown by the Moderna and Pfizer-BioNTech vaccines. (Shots using slightly more established methods, formulated by Johnson & Johnson, AstraZeneca, and others, have also shown strong results.) Both Pfizer and Moderna are testing strain-specific boosters that could be rolled out periodically, just as the flu shot is updated every year. Their mRNA technology allows researchers to easily combine shots against multiple variants into one vaccine, and mRNA shots can be updated faster than the technologies used to make the flu shot. Researchers are cautiously optimistic that the boosters will help provide more durable protection against symptomatic Covid from any variant.

Wang at his office in Singapore

PHOTOGRAPH BY JULIANA TAN FOR BLOOMBERG BUSINESSWEEK

Long term, there's still a risk that relying on updates to existing vaccines could leave people vulnerable. The coronavirus variants currently scourging the world already appear to be somewhat more able to escape vaccine-induced antibodies than the primary strain, ▶

◀ even as overall protection remains strong. In theory, a few more mutations in key portions of the virus could hobble the vaccines, forcing a scramble to catch up. Not to mention that a new bat coronavirus will probably emerge someday.

Bjorkman, the Caltech structural biologist, spent much of her career trying in vain to develop vaccines against HIV, one of the fastest-mutating viruses ever discovered. When Covid appeared, she started reading old papers from the few scientists who did coronavirus research pre-2020. "Every paper I read from coronavirus researchers said it is only a matter of time before we have a huge pandemic caused by a coronavirus," she recalls. Yet, as far as she could tell, no funding agency had made a sustained investment to come up with a broad-acting vaccine.

Now Bjorkman has turned her attention to the task. Working with researchers at Oxford, she's been testing a nanoparticle—a harmless, cage-like protein structure about the size of a virus—that incorporates key portions of the spike proteins from as many as eight coronaviruses. When she tried the vaccine in mice, it did something remarkable: It generated antibodies that could neutralize coronaviruses not included in the vaccine. She published the results in January, but hardly anyone paid attention. Some who did asked why the approach was needed. Once delta became pervasive in the summer, though, calls from potential collaborators began flooding in.

Bjorkman's team is one of at least four working on pancoronavirus vaccines using nanoparticles, which can be adorned with dozens of fragments from different coronaviruses. The proteins assemble into symmetrical balls with 24 or more sides to which immune-stimulating fragments from one or more viruses are attached. Some existing vaccines, including Merck & Co.'s shot for human papillomaviruses, are based on empty virus particles, a form of nanoparticle. But newer, modular nanoparticle vaccines are constructed from a variety of nonviral proteins. Bjorkman's mix-and-match nanoparticle is a 60-sided cage based on a synthetic design developed at Oxford.

The beauty of nanoparticles is that the immune system recognizes them as a virus, laying the groundwork for a more far-reaching immune response than with single-protein approaches to vaccines. And because they allow spikes from multiple coronaviruses to be placed on a single particle, they can, in theory, trigger immune cells to produce cross-acting antibodies capable of neutralizing numerous similar viruses. With nanoparticles, an antibody-producing cell "is seeing multiple spikes in a very small space at the same time," says Kayvon Modjarrad, a vaccine researcher at the Walter Reed Army Institute of Research. "We think it's probably pumping out a lot broader responses against all parts of the spike protein and making lots of each of those types of antibodies." He says researchers may not need to put every known coronavirus onto a nanoparticle to induce broad protection, just a representative sample.

Modjarrad and his colleagues have developed a nanoparticle-based vaccine using the iron-storage protein ferritin, to which eight Covid spike proteins are attached. In tests on lab animals, it generated neutralizing antibodies against SARS and Covid viruses; results from Phase 1 trials sponsored by the U.S. government are due soon. A third nanoparticle shot, from VBI Vaccines Inc. in Cambridge, Mass., has been found in lab testing to generate strong antibodies against numerous Covid variants and a cold virus called OC43. And two other nanoparticle shots, one out of Duke and another from the University of Washington, showed promise in animal experiments whose results were published this year in top scientific journals. The Duke team and its collaborators got $17.5 million from the NIH in September, the biggest chunk of the agency's pancoronavirus shot funding to date; this, after outside reviewers rejected a government grant proposal in 2020, because they didn't see the need, according to Barton Haynes, director of the Duke Human Vaccine Institute.

Then there's another major promising technology for pancoronavirus shots: mRNA, which would see the body's cells do the work of producing the vaccine, as they do in the Covid shots available now. Unlike with most other options, manufacturing mRNA vaccines doesn't involve growing proteins or viruses in live cells, so it's simpler to do on a large scale. Earlier this year, University of North Carolina virologist David Martinez and his colleagues took a big step toward a multi-coronavirus mRNA shot, by designing prototype vaccines that instruct cells to produce hybrid spike proteins. These proteins blend together the genetic code for chunks of multiple human and bat coronaviruses, thereby inducing a far-reaching immune response. "You can take pieces from a cousin coronavirus and pop it into a vaccine," Martinez explains. "Now you have made the spike vaccine more broad."

One vaccine the UNC researchers tested instructs cells to produce a spike protein consisting of one-third of the SARS spike, one-third of the original Covid-19 spike, and one-third of the spike from a bat coronavirus called HKU3-1. Lab mice that received the vaccine were protected against SARS, Covid, and another bat coronavirus strain that hadn't been included, according to results the researchers reported in *Science* in June.

Many antibodies made in response to infections and to mRNA vaccines target the business end of the spike protein, the part at the top that binds to receptors on human cells. But this portion mutates quickly, so many scientists are attempting to direct immune response toward parts of the protein that are less likely to differ between related viruses. Duane Wesemann, a biologist at Harvard Medical School, has been comparing blood samples from people who've been vaccinated or had mild Covid to try to identify the best strategy for designing

"Imagine if we had, back in February or March 2020, a vaccine

Coronaviruses in Humans

YEAR ISOLATED	VIRUS	NATURAL HOST	INTERMEDIATE HOST	SELECTED SYMPTOMS	CASE FATALITY RATE
1966	HCoV-229E	Bats	Camelids (possible)	Cold symptoms	Not available
1967	HCoV-OC43	Rodents	Cattle	Cold symptoms	Not available
2002	SARS-CoV	Bats	Palm civets	Fever, aches, headache	10%
2004	HCoV-NL63	Bats	Unknown	Cold symptoms, hypoxia, croup	Not available
2004	HCoV-HKU1	Rodents	Unknown	Cold symptoms, shortness of breath	Not available
2012	MERS-CoV	Bats	Dromedary camels	Fever, cough, chills	34%
2019	SARS-CoV-2	Bats (probable)	Unknown	Fever, cough, shortness of breath	1% to 1.7%*

*IN THE U.S. AS OF DECEMBER 2020. DATA: BLOOMBERG REPORTING, WORLD HEALTH ORGANIZATION, JAMA, NATURE

universal vaccines. He's found that the former Covid patients tend to produce proportionately fewer antibodies at first but a wider array of them, and that the antibodies that act against multiple coronaviruses tend to target the bottom portion of the spike and to be less frequent. Bolstering this theme, researchers at the University of Washington, working with San Francisco-based Vir Biotechnology Inc., have already identified some rare antibodies that target the bottom stem of the Covid spike and can neutralize numerous other coronaviruses, including SARS 1, the MERS virus, and even some common cold viruses, according to results reported in *Science* in August. In addition to providing clues for how to design pancoronavirus vaccines, this work could also lead to monoclonal antibody treatments for those who've been diagnosed with Covid.

And, finally, some researchers are trying not only to hit the spike protein, but also to stimulate other aspects of immune response. Gritstone Bio Inc., a biotechnology company based near San Francisco, is focusing on vaccines that also bolster the immune system's other main line of defense against viruses, killer T-cells, which can identify and destroy virus-infected cells. Because T-cells home in on internal viral proteins that are less likely to mutate, the protection they provide may be less susceptible to viral variants than purely spike-based shots. Gritstone is testing several vaccines that use mRNA to direct cells to produce the spike protein from Covid, as existing vaccines do, but that also add a second coronavirus protein, the nucleocapsid, that's a target for T-cells. The goal is a shot that stimulates their deployment against protein regions that don't differ widely between related viruses. One trial is under way in the U.K. using the strategy as a booster, while another human trial is slated to begin in South Africa in late 2021.

In the long run, the hardest part of developing a universal coronavirus shot may turn out to be the economics, not the science. As it stands, the most obvious business incentives run against creating and manufacturing pancoronavirus vaccines. Big companies such as Moderna and Pfizer are expected to make tens of billions of dollars this year and next selling their Covid vaccines and boosters. If variants such as delta and omicron keep emerging, the companies stand to continue profiting by tweaking their existing products with fourth, fifth, and sixth booster shots. That may give them less incentive to prioritize a panvariant shot that might just end the problem for good.

"Pfizer and Moderna aren't going to fund it," says Corey Casper, who heads the Infectious Disease Research Institute in Seattle, which is also working on pancoronavirus shots. (In response to a request for comment on this assertion, Pfizer said boosters remain "the best strategy currently available for protecting against circulating variants of concern." Moderna denied that it would delay moving ahead on a universal vaccine to protect its existing business.) Casper estimates it would cost $600 million for large-scale trials and manufacturing, calling that "a small investment for what would be such a huge return."

Even so, as with most every conflict between public need and commercial reality, large dollops of government and nonprofit funding would likely be required. It's not yet clear where all the money would come from or which countries would provide it, though CEPI says it's committed to bringing a pancoronavirus shot forward. Ultimately, countries are also the likeliest buyers, and companies may not go forward if there's no assurance that the shots will be bought and stockpiled. Since omicron, Casper says, he's been "on the phone nonstop" with government officials who seem well aware of the need. Yet where funding is concerned, he's mostly heard "lip service."

If governments were to stockpile, says Jason McLellan, a structural biologist at the University of Texas at Austin who's also working on the vaccines, they could roll them out to the most vulnerable populations quickly, buying time until virus-specific interventions can be developed. "You could get a vaccine that is maybe 60% to 70% efficacious against many existing coronaviruses or future ones that could be used early on in a pandemic to blunt that first wave," McLellan explains. "Imagine if we had, back in February or March 2020, a vaccine that was 60% to 70% efficacious, how that would have helped with the hospitalizations."

that was 60% to 70% efficacious, how that would have helped"

Wang, the Duke-NUS Medical School virologist, remains optimistic that governments and companies will see the wisdom of investing. He's planning to spend months or years in his high-rise lab in Singapore, perfecting his vaccine candidate. If it looks promising in animal testing, he hopes more money will be there to bring it through human trials and to manufacture it. "Before Covid, it would have been unthinkable," Wang says. "The world has changed. This is called preemptive vaccine development." B

The ESG

Sustainable investing is mostly about sustaining profits. MSCI, the largest ESG rating company, doesn't even try to measure the impact of a corporation on the Earth and its people

Mirage

By Cam Simpson, Akshat Rathi, and Saijel Kishan

For more than two decades, MSCI Inc. was a bland Wall Street company that made its money by arranging stocks into indexes for other companies that sell investments. Looking for ways into Asian tech? MSCI has indexes by country, sector, and market capitalization. Thinking about the implications of demographic shifts? Try the Ageing Society Opportunities Index. MSCI's clients turn these indexes into portfolios or financial products for investors worldwide. BlackRock Inc., the world's biggest asset manager, with $10 trillion under management, is MSCI's biggest customer.

Sales have historically been good, but no one was ever going to include MSCI itself in an index of sexy stocks. Then Henry Fernandez, the only chairman and chief executive officer MSCI has ever had, saw it was time for a change. In a presentation in February 2019 for the analysts who rate MSCI's stock, he said the company's data products, the source of its profits, were just "a means to an end." The actual mission of the company, he said, "is to help global investors build better portfolios for a better world."

Fernandez was borrowing the language from an idealistic movement that originated with a couple of fringe money managers in the 1980s. Yesterday's heterodoxy is today's Wall Street sales cliché. Investment firms have been capturing trillions of dollars from retail investors, pension funds, and others with promises that the stocks and bonds of big companies can yield tidy returns while also helping to save the planet or make life better for its people. The sale of these investments is now the fastest-growing segment of the global financial-services industry, thanks to marketing built on dire warnings about the climate crisis, wide-scale social unrest, and the pandemic.

No single company is more critical to Wall Street's new profit engine than MSCI, which dominates a foundational yet unregulated piece of the business: producing ratings on corporate "environmental, social, and governance" ▶

◀ practices. BlackRock and other investment salesmen use these ESG ratings, as they're called, to justify a "sustainable" label on stock and bond funds. For a significant number of investors, it's a powerful attraction.

Yet there's virtually no connection between MSCI's "better world" marketing and its methodology. That's because the ratings don't measure a company's impact on the Earth and society. In fact, they gauge the opposite: the potential impact of the world on the company and its shareholders. MSCI doesn't dispute this characterization. It defends its methodology as the most financially relevant for the companies it rates.

This critical feature of the ESG system, which flips the very notion of sustainable investing on its head for many investors, can be seen repeatedly in thousands of pages of MSCI's rating reports. *Bloomberg Businessweek* analyzed every ESG rating upgrade that MSCI awarded to companies in the S&P 500 from January 2020 through June of this year, as a record amount of cash flowed into ESG funds. In all, the review included 155 S&P 500 companies and their upgrades.

The most striking feature of the system is how rarely a company's record on climate change seems to get in the way of its climb up the ESG ladder—or even to factor at all. McDonald's Corp., one of the world's largest beef purchasers, generated more greenhouse gas emissions in 2019 than Portugal or Hungary, because of the company's supply chain. McDonald's produced 54 million tons of emissions that year, an increase of about 7% in four years. Yet on April 23, MSCI gave McDonald's a ratings upgrade, citing the company's environmental practices. MSCI did this after dropping carbon emissions from any consideration in the calculation of McDonald's rating. Why? Because MSCI determined that climate change neither poses a risk nor offers "opportunities" to the company's bottom line.

MSCI then recalculated McDonald's environmental score to give it credit for mitigating "risks associated with packaging material and waste" relative to its peers. That included McDonald's installation of recycling bins at an unspecified number of locations in France and the U.K.—countries where the company faces potential sanctions or regulations if it *doesn't* recycle. In this assessment, as in all others, MSCI was looking only at whether environmental issues had the potential to harm the company. Any mitigation of risks to the planet was incidental. McDonald's declined to comment on its ESG rating from MSCI.

This approach often yields a kind of doublespeak within the pages of a rating report. An upgrade based on a chemical company's "water stress" score, for example, doesn't involve measuring the company's impact on the water supplies of the communities where it makes chemicals. Rather, it measures whether the communities have enough water to sustain their factories. This applies even if MSCI's analysts find little evidence the company is trying to restrict discharges into local water systems.

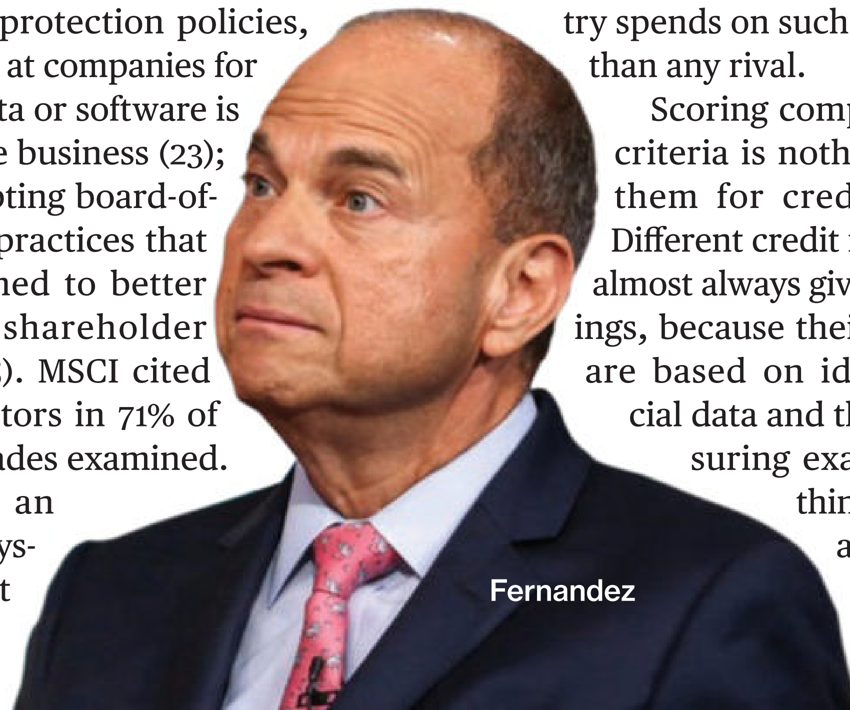
Even when they're not in opposition to the goal of a better world, it's hard to see how the upgrade factors cited in the majority of MSCI's reports contribute to that goal. In 51 upgrades, MSCI highlighted the adoption of policies involving ethics and corporate behavior—which includes bans on things that are already crimes, such as money laundering and bribery. Companies also got upgraded for employment practices such as conducting an annual employee survey that might reduce turnover (cited in 35 reports); adopting data protection policies, including at companies for which data or software is the entire business (23); and adopting board-of-director practices that are deemed to better protect shareholder value (25). MSCI cited these factors in 71% of the upgrades examined. Beneath an opaque system that investors believe is built to make a better world is one that instead sanctifies and rewards the most rudimentary business practices.

Criteria such as these explain why almost 90% of the stocks in the S&P 500 have wound up in ESG funds built with MSCI's ratings. What does sustainable mean if it applies to almost every company in a representative sample of the U.S. economy?

One thing it's meant for MSCI and its leader: a more than fourfold increase in its share price since the start of 2019, when Fernandez introduced his "better world" rebranding. Through his own holdings, that's likely made him the first billionaire created by the ESG business.

MSCI is hardly alone in enabling Wall Street's hottest new sales craze. About 160 providers, including the three biggest corporate-credit rating agencies and Bloomberg LP, the parent company of *Bloomberg Businessweek*, compete to sell sustainability ratings and data to money managers. (Bloomberg LP also has a partnership with MSCI to create ESG and other indexes for fixed-income investments.) But MSCI's dominance of ESG is overwhelming. Bloomberg Intelligence estimates that 60% of all the money retail investors have plowed into sustainable or ESG funds globally has gone into ones built on MSCI's ratings. (Fernandez told *Businessweek* he thought the real number was higher.) UBS Group AG, the Swiss investment bank, found MSCI earns almost 40¢ out of every dollar the investment industry spends on such data, far more than any rival.

Scoring companies on ESG criteria is nothing like rating them for creditworthiness. Different credit rating agencies almost always give the same ratings, because their assessments are based on identical financial data and they're all measuring exactly the same thing: the risk that a company will default on its


Fernandez

PREVIOUS SPREAD: PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (2). HERNANDEZ: CHRISTOPHER GOODNEY/BLOOMBERG

No matter how big a company's greenhouse gas emissions are, they might not even count in MSCI's ESG rating

debts. The U.S. Securities and Exchange Commission regulates credit raters.

MSCI and its competitors in ESG rating, by contrast, often disagree with one another, sometimes wildly. That's because each ESG rating provider uses its own proprietary system, algorithms, metrics, definitions, and sources of nonfinancial information, most of which aren't transparent and rely heavily on self-reporting by the companies they rate. No regulator examines the methodology or the results.

Nonetheless, MSCI borrows the grading scale, and the aura of credibility, of standardized credit ratings. MSCI converts its numerical scores for E, S, and G into overall ratings such as AAA, BBB, and the like. It's the only one of the major ESG raters to use those grades.

In MSCI's system, companies are measured not against universal standards but against their industry peers. And the starting proposition is that an average company in each peer group is worthy of a BBB rating. MSCI doesn't use the term "investment grade," but that's what BBB has meant for decades on Wall Street. By default, an average fossil fuel producer, utility company, automaker, used-car dealer, bank, retailer, chemical manufacturer, or arms maker earns that grade from MSCI. When a peer group swings, or MSCI changes its methodologies, companies can get upgraded for doing nothing other than staying the same. *Businessweek* found half of the 155 companies that got upgrades did so in significant part because of changes to the way MSCI calculated scores, not because of any change in the companies' behavior.

Robert Zevin has a unique perspective on how Wall Street has flipped sustainable investing on its head. He's one of two money managers credited with formalizing the practice in the 1980s, when it was known as socially responsible investing, or SRI. "It's not just Wall Street," Zevin says, "it's capitalism. It always finds some way to repackage an idea so it's profitable and mass-producible, and that's going to be hard to overcome."

Zevin stumbled into the creation of ethical investing. In the late '60s, he was managing family money while also teaching economics at Columbia and running an anti-Vietnam War movement called Resist. While fundraising for the cause, Zevin found that some wealthy individuals were shocked to discover that a peace activist was also a money manager. They started asking him to manage their wealth in ways that didn't conflict with their values. He later did similar work at U.S. Trust Co. of Boston.

Robert Schwartz was the other asset manager credited with formalizing ethical investing. He was the manager of investments for pension and welfare funds at Amalgamated Bank, which had been established by a labor union for garment workers. Schwartz discovered the union's funds were being invested in companies with anti-union policies. He reversed that and built an ethical-investing business at the bank. Later he brought clients with him to Bache & Co. and Shearson, where he was a broker.

Fernandez, like other ESG leaders, traces the business to the SRI movement. But there's a chasm between the two approaches, particularly when it comes to climate issues. No matter how big a company's greenhouse gas emissions are, they might not even count in MSCI's ESG rating. As long as regulations aimed at mitigating climate change pose no threat to the company's bottom line, MSCI deems emissions irrelevant.

Hence the decision to eliminate emissions from consideration of McDonald's, and the upgrade that came as they rose. "This issue does not present significant risks or opportunities to the company and with the assigned weight of 0% does not contribute to the overall ESG rating," MSCI's report said. Far more relevant to McDonald's bottom line, MSCI determined, was whether governments might further regulate its packaging. So those European recycling bins and the announcement of a policy to reduce plastic wrap gave McDonald's a 7 out of 10 on its underlying "E" score.

This wasn't unusual. Almost half of the 155 companies that got MSCI upgrades never took the basic step of fully disclosing their greenhouse gas emissions. Only one of the 155 upgrades examined by *Businessweek* cited an

McDonald's

The fast-food giant has decreased the greenhouse gas emissions of its offices and restaurants (Scope 1 emissions), and it's using less and/or cleaner energy (Scope 2 emissions are those produced by the company's energy providers); however, increases to emissions in its supply chain (Scope 3 emissions) vastly outweigh the savings

■ 2015 ■ 2019

Scope 1 and Scope 2 (market-based)

Scope 3 (supply chain)

DATA: COMPANY REPORT, FILING WITH CDP

actual cut in emissions as a key factor. As the Organization for Economic Cooperation and Development warned in a 2020 report, this means investors who rely on "E" scores and ratings, even high-ranking ones, can unwittingly increase the carbon footprint of their pensions or other investments.

Although it's hardly a household name, D.R. Horton Inc. builds more homes in the U.S. than any other company. Globally the construction industry is one of the biggest drivers of greenhouse gas emissions, as are its finished products. Together they accounted for almost 40% of global ▶

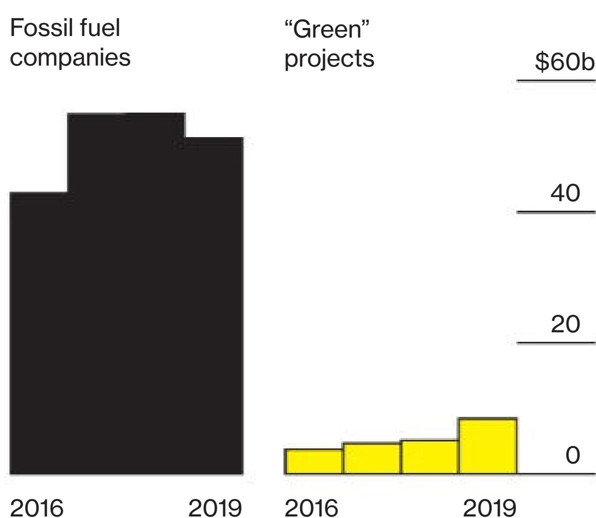
◀ energy-related emissions in 2019, according to a report by the United Nations Environment Programme and the Global Alliance for Buildings & Construction. That year, the report found, the "sector moved away and not towards the Paris Agreement" goal on cutting emissions.

D.R. Horton, which has a market capitalization of $38 billion, doesn't disclose any of its emissions, making it impossible to know exactly how big its contribution to climate change is. But the number of homes it built with the industry's green certification standards dropped to 3.4% last year, from an already modest 3.8% in 2019. MSCI upgraded the homebuilder anyway in March, giving it a BBB rating and citing a recalculation of D.R. Horton's "corporate behavior" score for policies on business ethics and corruption. The upgrade was MSCI's second of D.R. Horton in a year. About 10 weeks later, the homebuilder was added to the largest sustainable investment fund in the world, BlackRock's iShares ESG Aware MSCI USA ETF. As the name suggests, it's built on data licensed from MSCI. (D.R. Horton is no longer in the fund, but it hasn't been downgraded.)

Another company in the fund is JPMorgan Chase & Co., which since the announcement of the Paris Agreement at the end of 2015 has underwritten more bonds for fossil fuel companies—and earned more fees from them—than any other bank in the world. MSCI upgraded it in December 2020 to BBB. The rating report cited the bank's self-described green credentials: the publication of its first "climate report"; a committee it had formed on "green projects"; and the underwriting of $14.6 billion in so-called green bonds in 2019. It didn't mention the bank's fossil fuel bonds, which dwarfed green bonds in dollar volume. (That said, the trend in green bonds is going up

JPMorgan Chase

Bonds and loans underwritten by the bank between the Paris Agreement and the sales window included in MSCI's upgrade



DATA: BLOOMBERG LEAGUE TABLES

while the trend in fossil fuel bonds is going down.)

On May 21, MSCI gave a rare two-level upgrade to discount retailer Dollar General Corp.—from a junk B rating to BBB. Although the rating report noted that 89% of the company's revenue comes from selling "carbon intensive products," MSCI's analysts cited three other factors in Dollar General's double jump: data protection (it appointed a chief information officer); the announcement of a policy to limit products made with certain chemicals; and what MSCI described as internal ethics safeguards.

All of this makes perfect sense within the rules of the ESG game. MSCI's focus is profitability. That's why consideration of greenhouse gas emissions is a significant factor for regulated utilities but not a factor at all in the score of McDonald's. Utilities will be seriously exposed to higher costs if stricter emissions regulations come into effect. McDonald's, JPMorgan, and Dollar General won't.

Even sophisticated investors can be forgiven for not knowing what's going on inside the ratings used to build their ESG funds. MSCI's detailed rating reports are available only to its financial-industry clients. The sellers of ESG funds don't add much clarity. On the main page of its website for individual investors, BlackRock advertises iShares ESG Aware MSCI USA as offering exposure to "U.S. stocks with favorable environmental, social, and governance (ESG) practices." It doesn't tell anyone what "favorable practices" actually means.

Fernandez concedes ordinary investors piling into such funds have no idea that his ratings, and ESG overall, gauge the risk the world poses to a company, not the other way around. "No, they for sure don't understand that," he said in an interview in November on the sidelines of the COP26 climate change summit in Glasgow, Scotland. "I would even say many portfolio managers don't totally grasp that. Remember, they get paid. They're fiduciaries, you know. They're not as concerned about the risk to the world."

A Bloomberg Intelligence analysis earlier this year showed that BlackRock's ESG Aware holds a portfolio that closely tracks both the S&P 500 and BlackRock's own top-selling S&P 500 fund, with two notable exceptions: The ESG fund has a "sustainable" label thanks to MSCI, and it's more heavily weighted in 12 fossil fuel stocks than the actual S&P 500. Asked for comment, BlackRock said that the fund is not designed to offer investors the top ESG-scoring companies and that it shouldn't be compared to the S&P 500.

One other critical difference between the two BlackRock funds: Fees for ESG Aware are five times those for the S&P 500 fund. The ESG fund, now holding $24.8 billion, has grown by about $1 billion a month.

Not everyone on Wall Street is comfortable with the profits being made by giving investors the impression that they're contributing to the fight against climate change. Tariq Fancy,

Fernandez concedes ordinary investors have no idea that his ratings, and ESG overall, gauge the risk the world poses to a company, not the other way around

BlackRock's former chief investment officer for sustainable investing, initiated a one-man campaign this year against "green" financial products. "In essence, Wall Street is greenwashing the economic system and, in the process, creating a deadly distraction. I should know; I was at the heart of it," he declared in an essay for *USA Today*. Fancy and others say the emphasis on ESG has delayed and displaced urgent action needed to tackle the climate crisis and other issues, including the widening chasm between the rich and poor.

Fernandez has said he views ESG investing as a tool for preempting change as much as one for bringing it about. When he was on a marketing blitz last year to promote what he called the urgent need for the world to more fully adopt ESG investing, Fernandez got on CNBC's *Squawk on the Street*, a kind of investment sports show for who's up and who's down on Wall Street. "By the way," he told the hosts, "we're doing this to protect capitalism. Otherwise, government intervention is going to come, socialist ideas are going to come."

He went further in his interview at COP26, an interview MSCI solicited as it promoted ESG and a new climate-related data product. "It is 100% a defense of the free-enterprise, capitalistic system and has nothing to do with, you know, socialism or zealousness or any of that," he said.

Fernandez started his Wall Street career at Morgan Stanley. There he persuaded the company's executives to let him take over what he's described as a "cost center"—the division that produced indexes, especially in international stocks. He started making money rather than losing it, and the bosses let him reinvest profits in the business. Fernandez spun it off and brought the company public in 2007.

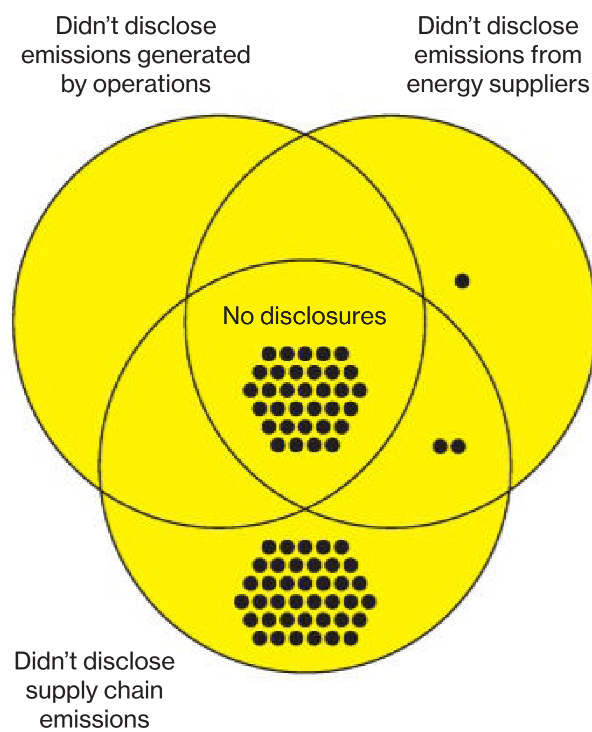
MSCI got into what would become the ESG business through the $1.55 billion acquisition of a company called RiskMetrics, which sold data tools to help asset managers account for risk in their portfolios. In the process, Fernandez got two other businesses RiskMetrics had recently acquired.

One, KLD Research & Analytics Inc., was started by a cadre of socially responsible investing pioneers to examine environmental and social factors in companies listed in the S&P 500. The other, Innovest Strategic Value Advisors Inc., was developing an early forerunner of the ESG ratings business. "We were trying to change the DNA of financial markets to help change the world," says Matthew Kiernan, founder of Innovest.

A culture clash simmered between new employees who were motivated by progressive causes and the MSCI employees who were devoted to creating products for money managers focused on profits. After MSCI laid off some of the old guard from KLD and shifted work to Mumbai, where lower costs enabled it to produce ESG-related data on a larger scale, tensions flared.

Don't Ask, Don't Tell

Roughly half of the companies upgraded by MSCI didn't fully disclose their emissions



FISCAL YEAR 2019 OR 2020 DISCLOSURES, AS OF DEC. 3.
DATA: COMPILED BY BLOOMBERG

In 2011 an MSCI team was invited to give a presentation in Boston about their business to a group of professionals in socially responsible investing, recalls Matt Moscardi, a former MSCI analyst who spent almost a decade at the company. Things got heated. "They started asking us about the layoffs, shifting some of our business to India, and yelling at us for destroying socially responsible investing by turning it into one giant model for massive asset managers to use," Moscardi says.

Fernandez calls many early ESG advocates extremists and says he pushed against their views inside the company. "I said, 'No, our job is to turn ESG into the mainstream of investing, not to create so much friction, and so much controversy, that it goes to the periphery.' "

Within MSCI, some dismissed the ESG team as a less-than-lucrative sideline. The skeptics included Baer Pettit, the company's president. "I've got to be honest," Pettit told analysts in the same February 2019 call that Fernandez used to roll out his better-world theme. "It was not obvious to me five years or seven years ago that this would be the growth we have in this area.…But this is a great example of getting out ahead of the investment process, understanding the trends, and then being able to monetize them."

In the same quarter in 2019 when he rebranded MSCI, Fernandez increased his holdings in its shares by 25%, his biggest boost since right after the company went public. With more than 2 million shares, he's the company's ninth-largest shareholder, below a list of big institutional investors. He reached billionaire status shortly after the opening bell rang on the New York Stock Exchange on the morning of June 17.

Fernandez was at COP26 both celebrating ESG investors—"You know for sure they're gonna help the world get better, 100%"—and marketing a new product, the MSCI Net-Zero Tracker, which estimates direct and indirect emissions from 9,300 companies and checks whether their climate plans are aligned with global goals. Other ESG ratings providers offer similar products. It seems unlikely they will have an impact on the emissions of those companies, but in the sustainable-investing business, the more important factor might be whether ordinary investors think they will. Ⓑ —*With Donal Griffin and Demetrios Pogkas*

RTO Is the Best Thing To Happen to Consultants Since Y2K

TOO BAD NO ONE KNOWS ANYTHING

BY MATTHEW BOYLE
ILLUSTRATIONS BY INKEE WANG

There are 17,000 online courses at LinkedIn Learning, the professional development arm of the career site, all taught by what LinkedIn Corp. deems "credible industry experts." A search for courses on returning to the office amid the seemingly never-ending pandemic—the most complex challenge corporate America has collectively faced, perhaps, ever—surfaces wisdom from every type of guru imaginable.

One course is taught by a genial etiquette expert named Jodi Smith, whose 33-minute video delivers the understatement that "things have changed, and so have we," but "luckily, etiquette evolves to fit the situation at hand." Another tutorial comes from Heidi Hanna, a "stress and resilience expert" with a doctorate in holistic nutrition who specializes in "possibility thinking." There's *Listful Thinking* author and former television producer Paula Rizzo, who's affiliated with the National Association of Professional Organizers. "I took juggling in high school," she says. "When one ball is up in the air, keep your eye on the other two. The same idea applies when you're moving between your office life and your home life." Then there's advice from Jim Rogers, a self-described expert in "concrete, reinforcing, and post-tensioning," who promises to give "a crash course on being a safety and health professional" before doling out pointers on upgrading air filtration systems.

You may be wondering how a manners aficionado, an organization whiz, and a construction guy became authorities in RTO, as return to office is known in business circles. The emergence of this vague and expansive new breed speaks to the desperation of employers trying to sort out how, when, and whether they and their workers should return to traditional offices. Big, hairy decisions need to be made: Go fully remote like Twitter Inc., require butts in seats like most Wall Street banks, or land on a new-age hybrid model? If it's a hybrid, do you mandate specific days in the office or trust employees to decide for themselves? Should all desks be free-floating, even the chief executive officer's? And do we really need all this office space to begin with?

The coronavirus and its ongoing variants have made a fool of any company that's tried to set rigid ground rules. Two-thirds of organizations surveyed by research consultant Gartner delayed their original return dates—most had been scheduled around Labor Day—including Apple and Google, while just over one-third have imposed a vaccine mandate, among them Walmart and Walt Disney. Those who pushed plans back to January are now being blindsided by omicron; others still have no idea when or if they're returning. "Anyone who tells you 'This is how it will be' doesn't know," says Steve Cadigan, a former HR chief at LinkedIn who consults on talent management issues and, yes, now also moonlights as an RTO consultant. "The employees who went home last year are not the same ones who are returning."

Confusion, chaos, and a void of any actual expertise, of course, create perfect conditions for corporate America's most brazen opportunists. Over the past 21 months, everyone from workforce and management consultants to design agencies, furniture companies, and real estate firms have swarmed in with their inevitable fresh angles and robust solutions. This new RTO industry began taking shape last year during lockdowns, when two things became clear: Working in an office was suddenly up for grabs, and old-school HR departments were in way over their heads.

Seemingly overnight, human resources people needed to become experts in office design, airflow, information technology, ZWCR (Zooming while child rearing), and infectious disease protocols. Navigating the ever-shifting federal, state, and local Covid-19 policies and transmission rates made reopening offices a game of chance, and the disconnect between most workers' desire for flexibility and most executives' demand that workers return to their desks put HR in a no-win situation. "HR folks didn't sign up for this," laments Andrea Mullens, vice president for human resources at Ingram Micro Inc.'s cloud computing division, which employs about 2,000 workers. "Every six weeks the conversations I have change completely. It's exhausting."

Eventually, the HR folks hit peak burnout: Executive recruiter Heidrick & Struggles has seen a 65% increase in searches for HR senior leaders, in part because of exhaustion. "We don't know how to manage these hybrid arrangements, which is the reality now," says Brad Bell, director of the Center for Advanced Human Resource Studies at Cornell. "I've studied remote work for two decades, but what we experienced over the last year and a half is nothing like what we studied."

As executives across the country frantically assembled internal cross-disciplinary SWAT teams and ordained remote-work czars, advice started to trickle in from human resources firms, many of which were already advising companies on broader projects and began tacking on the RTO work. But with RTO spanning everything from compensation to building operations to mental health, soon the tail began wagging the dog. The range of topics expanded, and so did the range of advisers, with most everyone flying blind. Finally, the greatest thing to happen to the consulting racket since Y2K had arrived.

In January, Chris Hyams, CEO of job site Indeed Inc., made the decision that about 70% of his 11,000 employees could permanently continue working from home. When vaccines became available last spring, just about all of the remaining 30%—with roles that sometimes demanded face to face, such as sales and client services—would be required to go back to the office at least two days a week beginning in September.

Over the summer he opened a handful of Indeed's 33 offices at about 25% capacity. By July the delta variant's spread forced offices to close again and made a September return untenable, so after consulting with his in-house RTO task force—about a dozen people including his deputies in real estate, communications, HR, finance, facilities, and sales—he pushed it back to January 2022. Then, in September, after yet another task force summit, Hyams pushed the date back again, to July 2022, giving employees with kids flexibility through the end ▶

◀ of the school year—a hard deadline that could very well still change. "We've been using the word 'unprecedented' an unprecedented number of times lately," Hyams says, exhausted by the maelstrom of meetings, mandates, and misgivings that now occupy a good chunk of his time.

The stress for CEOs isn't just a logistical nightmare; botched RTOs could lead to a breakdown in trust between labor and management, exacerbating what are already record rates of employee turnover. More than half of workers would consider quitting if asked back to the office before they're ready, according to an ongoing weekly survey of about 400 remote workers by pollster Morning Consult LLC.

Don't assume younger workers are the most eager to ditch the office: Employees over the age of 60 are actually more likely to want to work remotely full time, according to the Future Forum, a research consortium founded by Slack Technologies Inc. Defections are likely to be highest among women, who've borne the brunt of domestic duties while working from home; people of color, who are more hesitant to return to the everyday microaggressions of office life; and in-demand technology talent, who see greener, more virtual pastures elsewhere. All of this is amid the precarious backdrop of the Great Resignation, in which members of an antsy workforce who largely sat tight during the height of the pandemic are now abandoning jobs en masse.

"NOW WE'VE ALL BECOME FUTURISTS"

Through all this, managers are having a hard time just managing. Should vaccines be mandated? Should sweatpants be outlawed? The choices companies make now will shape their cultures for years.

The pandemic has turned organizations into labor laboratories, testing in real time the impact that remote work has had on productivity, collaboration, innovation, engagement, and mental health. Research has shown that employees are just as effective, often more so, working from home, but when you poll those working remotely now, a clear disconnect emerges. Almost half of executives want to be in the office every day, but only 17% of the rank and file do, according to the Future Forum's ongoing survey of more than 10,000 knowledge workers. Some never want to return to the office, some would be happy coming in a few times a week, and some aren't really sure what they want yet.

FUD—fear, uncertainty, and doubt—is, of course, catnip for consultants. Early in the pandemic, much of the RTO advice began coming from HR specialists such as Mercer and Willis Towers Watson. Soon the workforce units of the Big Four professional services firms—PwC, EY (formerly Ernst & Young), KPMG, and Deloitte—smelled opportunity and joined the fray. The blue-chip management consultants—McKinsey, Bain, Boston Consulting Group—also couldn't resist applying their PowerPoint wizardry to the mix. Then boutique firms rushed in to fill the gaps. "Even if it's not a traditional RTO project, we are engaging in this discussion with almost all of our clients," says Melissa Jezior, CEO of Eagle Hill Consulting LLC, a workforce consulting agency based in Arlington, Va. "It touches everything."

In recent years, most of these firms began trafficking in the hot new catchall of "transformation services," which isn't tied to a specific event such as a merger or layoff, but rather is an ongoing process that, like therapy, intentionally never ends. Engagements can run from $5 million to $10 million or more per project, becoming one of the fastest-growing sectors of the $480 billion global consulting industry, according to Kennedy Research Reports, which tracks the sector. Since it already incorporates talent, technology, and even the "future of work," many of these firms were already perfectly situated to offer clients RTO hand-holding. "The future of work was on the back burner before Covid," says Jeff Schwartz, who spent 31 years as a consultant before joining a startup that does artificial-intelligence-powered job matchmaking. "Now we've all become futurists."

It didn't take long for an even broader feeding frenzy to ensue. Architects and designers swooped in to redesign traditional workspaces, advising clients that since the office is no longer an everyday necessity for many workers, it has to be recast as a more desirable destination. "It's created quite a bit of great new work for our firm," says Lise Newman, director of workplace practice at design firm SmithGroup, which is redesigning offices for General Motors Co. and other big clients. The challenge in the post-office world, Newman says, is settling on a design that employees "want to come back to, rather than kicking and screaming."

For the GM project, SmithGroup is creating "neighborhoods" inside the automaker's engineering hub, where teams have a dedicated space to collaborate, socialize, and work privately when they need to. Office furniture maker Herman Miller—famous for bringing us the cubicle and the Aeron chair—started a partnership with SmithGroup to provide mobile, Zoom-friendly furniture. (Not to be outdone, office furniture rival Steelcase Inc., which has its own workplace consulting practice, has rolled out 16 products under a pandemic-inspired collection dubbed Flex that includes desks, stools, and something called "privacy wraps," partially covered cubicles for workers toggling between video calls and "sustained heads-down focus time.") Ryan Anderson, vice president for global research and insights at MillerKnoll (owner of Herman Miller), says the pandemic provided "the catalyst we needed to finally rethink office design, which was not in a great state pre-pandemic."

Office landlords, sensing that revenue was about to plummet, began peddling RTO strategies, too. Fitch Ratings Inc. recently reported that if companies were to adopt just a day and a half of remote work per week, landlords' cash flows would fall 15%. In June real estate titan JLL, whose customers include Microsoft Corp. and Capital One Financial Corp., rebranded its Corporate Solutions practice as Work

Dynamics, with the goal of taking a more "human-centric" approach to managing office environments, according to Sanjay Rishi, Americas CEO of the unit. In April 2021 it rolled out Experience/Anywhere, a bundle of software and services that lets JLL tenants manage a hybrid workforce—such as employee communication, contractor management, onboarding new hires, and "ergonomic assessments"—regardless of whether they're tethered to a downtown high-rise or not. "We used to go to work," says Rishi, sounding newly enlightened, perhaps since trying to offset potential revenue losses. "But now work is not where you go. It's what you do."

In 1999 fear ripped through companies across the country as word spread that the coming millennium would crash their computer operations, which spawned an army of in-demand Y2K consultants. Fast-forward to the summer of 2020, when the murder of George Floyd led to a national racial reckoning. Next came the flood of diversity and inclusion consultants, promising to help clueless companies navigate complex issues around race. The Y2K consultants turned out to be fleeting (spoiler for those who weren't in the workforce then: the crash never happened), while diversity and inclusion consultants, for good reason, aren't going anywhere anytime soon.

RTO has landed somewhere in the middle. "We have seen a whole new industry sprout up over the last year," says Kelly Yeates, vice president for service operations at Insperity Inc., which serves as the HR department for hundreds of small-business clients. Like any dramatic moment that draws a new set of experts to steer deep-pocketed companies through perilous water—recessions, terrorist attacks, financial crises—the quality of the talent and the advice is a mixed bag. "There will always be charlatans, but you can only succeed on bluster for so long," says Eagle Hill's Jezior. "It's crazy," says Bryan Walker, a partner at innovation and design firm Ideo, who works with companies to overhaul their cultures. "People in this space are selling a solution, but there is no precedent to [RTO]. How is that going to work, exactly?"

Whether the RTO-industrial complex ultimately advises itself out of a job will depend largely on whether the gurus can successfully pivot from prosaic advice on ventilation systems and Zoom etiquette to the more complex issue of the ever-evolving "workplace" and how to manage the shifting demands that come with it.

In the meantime, it seems even the RTO consultants could use some help planning their own transition. PwC counsels its billion-dollar clients on RTO, but U.S. Chief Products and Technology Officer Joe Atkinson is the one saddled with getting PwC's 79 U.S. offices ready for its workforce to return.

Like many companies, the consulting firm had planned to open back up fully in September, but in late August it pushed that to November. Then, in early October, it made the radical decision to allow its 40,000 U.S.-based client services staff to work remotely in perpetuity. For those who choose to return to their desks by their own free will, Atkinson has the earthly task of upgrading four-year-old computer monitors so they're HDMI-compatible. "No management team has tried to figure out how to bring everyone back at once," he concedes. "There is no playbook." B

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WELCOME TO THE WORLD OF VIRTUAL LUXURY

PURSUITS

BALENCIAGA, BURBERRY, GUCCI, AND OTHER BRANDS ARE RACING TO PLANT FLAGS IN THE NASCENT METAVERSE

BY MARK ELLWOOD

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December 13, 2021

Edited by Chris Rovzar

Businessweek.com

The waiting list for a Birkin bag can stretch years, but for some, the only purse they want is one they'll never get their hands on. The Dematerialised, a British startup that co-founder Karinna Nobbs calls "the digital department store of your dreams," sells nothing but virtual luxuries; it's a marketplace for clothing and accessories that will only ever exist online.

The first piece it brought out, on Dec. 12, 2020, was a silver sweater selling for €121 ($137). Like all of her products since, the whole run—1,212 digital renderings—sold within three hours. Nobbs has also worked with the Fabricant, a Dutch virtual couture house where users create exclusive apparel for their digital avatars on social platforms including VRChat, a 3D digital world that soared in popularity during the pandemic. The Fabricant collaboration scored the priciest sale at her store so far: €9,000 for a single garment—or, more precisely, nongarment.

The Dematerialised operates on the stock model popularized by streetwear, releasing a shoe, bag, or other item in a limited edition, usually of no more than 150 units. Only a single brand or computer-designed product is available at any one time.

Successful buyers receive an NFT, or nonfungible token, which is a virtual certificate of ownership that runs on blockchain technology. With this proof of authenticity, an owner can showcase a handbag or dress on VRChat, where tens of thousands of users interact daily through avatars—and flaunt their outfits.

It may seem silly, spending top dollar for luxuries you can never touch or hold, but gamers have long used clothes to proudly establish their online identity, just as people do in the real world. Called "skins," these outfits or shells are bought by players to painstakingly customize their appearance in an online game. And executives in the fashion industry are taking the trend seriously, especially after Facebook's rebrand as Meta Platforms Inc. refocused it on creating a simulated digital world where users can interact as if in a real physical space. Suddenly this niche practice has the potential to get very big. In an October video announcement of its plans, Chief Executive Officer Mark Zuckerberg could be seen using his and his colleagues' avatars to try on clothes, play cards, pay artists, and even go surfing.

"Avatars will be as common as profile pictures today, but instead of a static image, they're going to be living 3D representations of you, your expressions, your gestures," Zuckerberg explained. "You're going to have a wardrobe of virtual clothes for different occasions designed by different creators and from different apps and experiences."

He went on to describe how Meta would help creators make clothing, home décor, and accessories that can be carried from one platform to the other—say, from Meta's universe to the game world of *Halo*.

By choosing the name Meta, the social media behemoth is hoping to claim some ownership over a new galaxy of possibilities. "The metaverse"—as the expanding terrain of virtual environments is known—includes Roblox, a platform where users can create games and geographies for others, and *Fortnite*, the multiplayer battle game that's now also a social space and recently struck a deal with Ferrari. Tim Sweeney, CEO of Epic Games Inc., which makes *Fortnite*, said in November that the metaverse has the potential to become a multitrillion-dollar part of the world economy.

The Dematerialised is a first mover in this next frontier. In addition to VRChat, the store's items will also be able to appear in rival blockchain-based worlds such as Decentraland, Cryptovoxels, and Somnium Space, where the currency is all digital and participants "own" parcels of "land" used to store and sell the items. The Decentralized garments can't yet be worn in Roblox or *Fortnite*. But if things go the way Zuckerberg predicts, digital luxuries will soon be a common feature of these worlds as well. Brands such as Gucci, Balenciaga, and Burberry have launched products in both (see sidebar).

The Impossible tiara, which sold at Dolce & Gabbana's couture fashion show in October

THE RUNWAY OF THE FUTURE

Already, big names are staking a claim in the metaverse. The Gucci Garden, for example, a pop-up on Roblox that sold the brand's designs, saw one bag fetch $4,000 in real-world cash. Nike Inc., too, has announced an in-depth partnership with the platform to create Nikeland, a virtual world modeled after the company's headquarters in Oregon that'll offer exclusive goods for sale. In September, Balenciaga brought out a collection of clothes in *Fortnite*. These "skins," or outfits for game characters, are purchased using V-Bucks, the currency of the *Fortnite* world. (V-Bucks cost real money to obtain.) Tommy Hilfiger's venture capital arm has announced a partnership with EWG Virtual, a viral marketing agency, to focus on so-called v-commerce. Not to be outdone, Burberry created a string of unique characters called Sharky B—playable NFT creations complete with jetpack, armbands, and pool shoes—to live in *Blankos Block Party* from Mythical Games. The collection sold out quickly, for almost $400,000. But nothing compares with Dolce & Gabbana's efforts to settle the metaverse. At its Alta Moda show in Venice in September, the brand unveiled a separate nine-look collection of men's and women's clothing and accessories, also attached to NFTs. Four designs were virtual-only; the rest included a real-world garment. Sold at auction, this futuristic collection tallied $5.7 million.

SO, WHY IS FASHION FIRST?

No old-school industry has embraced the metaverse quite like fashion. It's a radical contrast with 20 years ago, when brands scoffed at internet 1.0. Even by 2008—three years after Amazon Prime started—only one-third of the luxury companies surveyed by Forrester Research sold wares online. By then, Prada barely had a website.

In March 2016, just before many of these virtual worlds were born, Kerry Murphy co-founded the Fabricant, one of the key brand partners at Nobbs's digital department store. An expert in visual effects for film and advertising, he brought on as creative director Amber Jae Slooten, the first person to graduate from the Amsterdam Fashion Institute with a portfolio of all-digital designs.

"She had fought her way through, to be able to not have any physical items in her portfolio," Murphy says. "Her motivation really came from the Rana Plaza incident in Bangladesh, where the building collapsed and killed more than 1,100 people working on fast fashion." After that, Slooten took a stance against the physical fashion industry.

The Fabricant's first major project was with I.T Hong Kong, a luxury department store, which hired the team to render real-world garments from almost 100 luxury labels in metaverse-ready 3D. But Murphy wanted Slooten to produce her own designs—a fulfillment of her moral and creative mission. In early 2019 the Fabricant joined with blockchain-based gaming company Dapper Labs for its first virtual garment, a dress, which went on auction at New York's blockchain-technology-centered Ethereal Summit in May of that year.

It sold for the then-equivalent of $9,500 in Ethereum. (The same amount of the cryptocurrency is now worth about $150,000.) "We literally sold a JPEG, a picture, with a smart contract on a USB stick that verifies [the buyer's] ownership," Murphy says, noting that it came with the right to have the item Photoshopped by the Fabricant onto three different images. The buyer gifted the dress to his wife, who shared images of herself "wearing" it on social media.

Murphy and his team have been finessing that unwieldy sort of transaction over the past two years. The Fabricant now has its own platform, currently in beta. "Users can create their own digital fashion, minted [validated] on the blockchain, and use it as a wearable in multiple different games or make a Snapchat filter out of it," Murphy says. "We're really focusing on the creator economy, where we make everybody a digital fashion designer."

If these amateur Armanis sell their designs to fellow users, the Fabricant receives a 10% fee. It invited just 50 creatives for this initial phase, but it will open up to 5,000 more later this month.

A Carnival bodysuit from a collaboration between the Fabricant and design house Nicopanda and Brazilian pop performer Pabllo Vittar

TIARA: COURTESY DOLCE & GABANNA. BODYSUIT: COURTESY THE FABRICANT

THE MARGINS ARE HUGE

Since there are no raw materials to buy, and labor is minimal, virtual clothes are almost all profit. (Stitching a couture garment takes days, or even weeks, compared with adjusting pre-programmed clothes templates, which can take minutes.) Minting designs in the metaverse also opens up huge avenues of creativity. After all, the garments can look like anything a designer wants; the limitations normally imposed by market practicalities—or even gravity or logic—are gone.

Any company with decades of archival designs can convert that intellectual property into a new revenue stream, reissuing pieces as metaverse-only. Defunct brands can have a new virtual life with minimal investment—think Schiaparelli's lobster dress or Jackie Kennedy's pillbox hat by Halston.

Consultant Cathy Hackl is working on this exact idea. Her expertise guiding neophytes into these virtual worlds has earned her the nickname Godmother of the Metaverse.

"Not everything they create in the metaverse needs to be new. They can leverage their many years of history ▶

◀ and heritage and introduce their legacy to new generations," she says. "Nostalgia is a powerful sentiment, and at the end of the day, creativity is creativity."

PLUS! NO OVERSTOCK, NO DISCOUNTS

Gonçalo Cruz believes resource awareness will spur a boom in virtual luxury. He's the co-founder and CEO of PlatformE, a tech provider based in Porto, Portugal, that helps conventional brands finesse and deploy 3D renderings of things such as clothing. Clients have included both major luxury conglomerates, Kering and LVMH, for brands like Gucci and Dior. Farfetch and Nordstrom have also called on his expertise.

Cruz says virtual luxury can solve the problem of oversupply that hinders the sector's growth. The issue emerged after World War II, when French designers created cheaper, prêt-à-porter collections to boost their bottom lines. This focus on volume, Cruz says, eventually led to the resource-draining fast-fashion system that dominates today.

"Every single brand has overproduction, has overinventory, and obviously has end-of-season stock," he says of the fashion industry at large. "So you start discounting, and that's a never-ending story. You see 90% discounts in outlets now. That depreciates the value of the brand."

He argues that by training shoppers to start virtual-first, all kinds of brands can nearly eliminate such end-of-season sales. Picture a virtual fashion show—an army of digital Gigi Hadids sashaying up and down a make-believe catwalk, kitted out in a variety of designs. Actual consumers could place orders from their screens, allowing the brand to physically produce only what's already been sold—instead of filling endless Zaras or Ralph Laurens with real garments to try on. Avatars will have sizing built in and can test out the outfits for their real-life counterparts.

Or, if the outfit was only ever purchased for the avatar—like a virtual Gucci purse that sold in May for more than the same bag in the real world—then these clothes may never have to be sewn at all.

Cruz is so committed to this idea that PlatformE is now going beyond its work with Kering and company to launch an in-house label, Valaclava. It will make its debut online, with items designed anonymously by artists and illustrators—some with fashion backgrounds, others with little experience in the field.

The outfit you see on the virtual runway will sell as an NFT, which the highest bidder will own, much like a patent. The buyer won't receive a physical version of the garment, though they'll get all the technical information needed to have it made in the real world if they wish. Three hundred other shoppers will be able to buy real-world versions of the look without the NFT, because some people are still into that sort of thing.

BONUS: REVENUE, FOREVER

There's another reason luxury labels are rushing to embrace NFTs and virtual designs: the secondary and resale market, popularized by companies such as RealReal Inc. and Fashionphile Group LLC. The NFT setup lets the labels finally monetize a market they've long struggled to crack. NFTs assure authenticity, which discourages knockoffs, and can embed the equivalent of a sitcom actor's residuals in every luxury dress or bag.

"Normally if something is sold [on a resale site] now, Hermès does not make a penny off that. But with digital items there's a huge opportunity for continued revenue when they're resold," Hackl explains.

All it takes is for the smart certificate or NFT to include a royalty fee or revenue share on future transactions, guaranteeing the original designer a percentage of whatever's paid. The Fabricant already operates like this on its creator-powered platform by taking a 5% royalty whenever a garment is resold after the first purchase.

SO, IS THIS THE END OF REAL STUFF?

In short, no. At least, not yet. Virtual couture remains a niche business. One of the biggest obstacles remains the clumsiness of how to wear what's purchased; there are the technology barriers among metaverses, as enunciated by Zuckerberg. And we're still far away from a world in which augmented-reality goggles, also touted in his Meta presentation, are commonplace. (In that world, a virtual garment can be worn on your actual body for passersby wearing the lenses to admire.)

But there's a whole generation of young people who've grown up playing video games in environments where what you look like and what you "have" is valuable. For them, the idea of investing in your digital appearance makes perfect sense. So while the flowering of some of these ideas may seem far off yet, their roots are already deep.

Gala Vrbanic, an avid gamer and the founder of Tribute Brand, which sells digital fashions that can be shared on social media, predicts that in the future, "all the fashion moments will happen in the digital world." Put more simply, we'll wear comfortable clothes around on Earth and showcase our style in its virtual counterparts.

The Dematerialised's Nobbs confesses that her ultimate goal is to open a brick-and-mortar store that sells nothing but virtual clothes. "Marie Kondo has been telling us for quite some time we have too much stuff in our wardrobes, and we all know that," she says. "I think we'll go to people having a larger digital than physical collection of clothes." Ⓑ

Addicted to Work

In *Out of Office*, two remote-work evangelists uncover the cause of all your stress: Your job
By David Wainer

The journalist couple Charlie Warzel and Anne Helen Petersen moved from Brooklyn, N.Y., to Montana in 2017, thinking they would replace the time saved from their subway commute with hiking, kayaking, and skiing. But work, they soon discovered, simply absorbed the extra time.

Millions of Americans have experienced something similar during our ongoing mass remote-work experiment. Although much of corporate America was no longer stuck in traffic or slogging it out on trains, the fusion of the home and the office actually made it harder to disconnect.

Almost two years into the pandemic, none of this is exactly a revelation. But in *Out of Office: The Big Problem and Bigger Promise of Working From Home* ($27; Knopf), Warzel and Petersen argue that better remote work is possible—but only if we first repair our broken relationship with our jobs. Cutting the cord to the office is a chance to address bigger issues in the U.S. labor force, including child care, inefficient working methods, burnout, "toxic individualism," and work-life balance.

In 1930 economist John Maynard Keynes predicted that his grandchildren might inherit a 15-hour workweek as technology made jobs more efficient. That version of labor never arrived. Instead, as the U.S. economy expanded, workaholism became the norm, the inevitable result of a shareholder-centric culture with no guardrails. Whereas increased productivity and wealth tend to lead to more leisure time in Germany, the Netherlands, and other rich countries, America has bucked that trend.

Much of *Out of Office* has been documented by the incessant stream of material published about remote work since March 2020 (including in this magazine). But Warzel and Petersen sketch a vision of what a better future might look like. At its core is a simple thesis: Better work is often "less work, over fewer hours, which makes people happier, more creative, more invested in the work they do and the people they do it for."

One negative byproduct of the hybrid workplace, they suggest, is the shadow hierarchy that emerges as overly ambitious employees show up in person while "remote employees, motivated by the anxiety of not seeming productive, will live in fear of managers and compensate with overwork." The authors speak with the head of human resources at Twitter Inc., where one rather clunky solution to this imbalance is to ask everyone inside a conference room to also dial into the meeting via laptop so remote participants see all faces clearly.

The authors don't devote much space to discussing the role U.S. politics play in enabling our work practices. And one word is notably absent: China. The Chinese work harder than their American counterparts and have successfully built companies that rival U.S. conglomerates. Europeans may, on average, have a better work-life balance, but they've struggled to keep up with the U.S. and China when it comes to innovation.

Where Warzel and Petersen see promise is in companies such as Buffer, a startup that found productivity shot up when it switched to a four-day workweek during the pandemic. Other experiments have yielded similar results. "The real innovation of the four-day week, like other flexible, intentional schedules," they write, "is the conscious exchange of faux productivity for genuine, organizationwide, collaborative work."

The biggest gaps in the book are the authors' narrow focus on U.S.-centric knowledge workers. They primarily write about people like themselves, the roughly 42% of the workforce who can do their work from home. Yet the pandemic is forcing a reckoning across the entire economy. Americans are leaving their jobs at staggering rates, while many of those who stay, especially in lower-wage jobs, are discovering more power to strike and demand better terms.

Warzel and Petersen aren't anti-office blowhards, but they are unabashed evangelists for the promise of remote work. They've intentionally detached themselves from office culture—first by moving cross-country and later by leaving their respective employers. (Petersen covered culture at *BuzzFeed*; Warzel was a tech and politics columnist at the *New York Times*, though he's since joined the *Atlantic*.)

At its best, *Out of Office* serves as a prescient, rough guide for how companies and workers can have a healthier relationship with each other. They write, "Remote work—not remote work during a pandemic, not remote work under duress—can change your life." Ⓑ

ILLUSTRATION BY MIKE HADDAD

A Vision for Guatemala's Tourism Future

A small chain of hotels is planning for a future of safer travel to a country filled with cultural riches. *By Brandon Presser*

"It's so hard to find a quality shaman. None of the good ones are on Google," says Claudia Bosch from across the table. We're at the inaugural dinner celebrating the opening of Villa Bokéh in a mansion just beyond the cobbled streets of colonial Antigua in central Guatemala. It's the latest project of Bosch's hospitality company, Grupo Alta, which now operates two Relais & Chateaux hotels plus a handful of other tourism enterprises and restaurants throughout the country.

So far, my experience of the urban resort had been limited to a séance with Tomás Mendoza, her favorite Mayan mystic. Shamanistic readings are among the unique experiences on offer at Antigua's first true luxurious place to stay, and the second hotel in what Bosch says will eventually be a high-end travel circuit through Guatemala. During our session, using nothing more than the precise time and place of my birth, Don Tomás spouted off a very convincing rendition of my life story as a Peter Pan who adventures to far-flung corners of the world.

Don Tomás may speak uncannily to spirits of the past, but Bosch has her vision set on the future, one in which Guatemala is safe for tourists and has blossomed into a thriving luxury travel destination.

Bosch's growing empire is among a few companies making a bet on posh tourism in a country that's troubled domestically and visited rarely—primarily by backpackers. Others include global tour operators Black Tomato and Big Five, which have championed the destination for years.

A view of Lake Atitlán from Casa Palopó's dining room

For many visitors, it's a risky proposition. Since the start of its civil war in the 1960s, Guatemala has been caught in the crosshairs of a migration crisis that flows up to the U.S. border. Certain neighborhoods in the capital, Guatemala City, and two western regions of the country, have been deemed "Do Not Travel" zones by the U.S. Department of State for their rampant crime—including narcotics trafficking and gang violence. The State Department also cautions about severe food scarcity and a high infection rate for Covid-19.

What drew me south

is the promise—Bosch's promise, even—that in the coming years Guatemala will become a great place to visit for everyone. As Don Tomás knew, I'm an adventure-oriented traveler who likes to experience areas before the hordes get there, which usually requires far more than a five-hour direct flight from New York. Luring other travelers has been more difficult.

For Bosch, a native Guatemalan with Dutch, Spanish, and Mayan lineage, tourism is the answer to the nation's geopolitical conundrums. Guatemala has the highest percentage of Indigenous peoples in Central America—a rich cultural heritage that, when elevated to the world stage, she believes can be the backbone of an upwardly mobile travel economy with the power to preserve tradition and change lives.

It's a homegrown and singular effort that began over a decade ago with the opening of Bosch's first hotel in Lake Atitlán, a two-hour drive west of Antigua. The destination is comprised of 12 *pueblitos*—little towns where you'll hear the staccato consonants of the Kaqchikel and Quiché dialects—all flanking a primordial volcano crater.

The hotel, Casa Palopó, features 15 rooms in a series of houses that climb up a ridge. It supports a slate of community initiatives; while staying there a few days prior to Villa Bokéh's opening, I painted homes in town as part of a mural project to cover every facade with bright Mayan motifs.

Bosch's greater plan is "to close the triangle" with a third hotel—more luxurious and trailblazing than her first two. She wants to build an ultraluxury resort in El Petén, a great swath of rainforest that, on the map, sits like a top hat above the more urbanized portion of the country. Dauntless visitors flock to the town of Flores, the regional capital and gateway to the staggering ruins of Tikal, once a major metropolis of the ancient Mayan Empire, with vast ziggurats whose crowns peek over the jungle canopy.

Archaeologists think that a dozen more Tikals lay hidden under the area's dense forests. Ambitious excavation projects have started to uncover the pre-Columbian settlement of Holmul and its elaborate stucco friezes. Nearby, El Mirador is believed to be the largest city of the Mayan Empire at more than 14 square miles, or roughly three times the size of Downtown Los Angeles.

"It's a proper Indiana Jones experience," says Luca Fella, a Latin America travel specialist at Black Tomato who arranges helicopter tours for clients to fly in and explore the marvels without dangerous, dayslong expeditions.

In the coming years, Bosch hopes her hotel will make it possible to share the experience with many more travelers and help create hundreds of jobs around Flores, including a fully local team of chefs, along with a sommelier, and, because it's Guatemala, a resident mystic. And no, it won't be one of those low-quality shamans who's easily searchable on Google. Ⓑ

The colorful streets of Antigua offer grand volcano views

MODERN MAYAN TREASURES

Local artisans are imbuing their country's ancient crafts with modern aesthetics. Here's what to bring home.

Huipil: The brand Luna Zorro rehabs vintage *huipiles*—Guatemala's traditional wide-cut blouses, often featuring bright woven patterns of Mayan geometry—and turns them into couture. Its glass-encased shop, on a coffee farm 15 minutes outside Antigua, also carries a compelling line of body-length robes made on traditional looms.

Woven carpets: The lambswool rugs and pillow covers at Antigua's Nada Duele bear mod, Picasso-esque doodles and are made by Indigenous master weavers using millennia-old methods.

Wooden kitchenware: Teak and dark-brown ziricote, along with alabaster, distinguish Itza Wood's elegant serveware. All the timbers grow wild in El Petén, where the company runs reforestation and job-creation efforts for the Indigenous community.

At Luna Zorro fabrics are hand-dyed

VOLCANO TO TABLE

The Guatemala dinner plate is a panoply of ingredients that will seem exotic to the uninitiated, and they're all grown in more than 300 cultivated microclimates that benefit from volcanically supercharged soil. For Marco Sáenz, Grupo Alta's newly appointed executive chef, the many varieties of corn—or *elote*—reign supreme. Sáenz makes little purple, white, and yellow pillows out of heirloom kernels, sometimes blending them with native herbs like chipilín, loroco, and hierba mora. He tops them with fanciful varieties of mushrooms, tomatoes, and plantains. Diego Telles—whose résumé includes a stint at Copenhagen's Noma—similarly highlights Guatemala's unique bounty as chef-owner of Flor de Lis, a dark and edgy spot in historic Antigua. Among his riffs on Indigenous dishes are a burnt *chayote* (or *perulero*, as the local variety is called) drizzled with fermented garlic and a tostada made from amaranth and chili ash stuffed with frog legs and giant ants.

ANTIGUA: LUCY BROWN/ALAMY. CASA PALOPO, LUNA ZORRO: BROWNYN KNIGHT

The No-Stress Saloon

Mercedes's first electric car, the yachtlike EQS, will lull away your range anxiety. *By Hannah Elliott*

Here's irony: The most technologically advanced production car Mercedes-Benz has ever made, the 2022 EQS, shines best when accomplishing the most basic of tasks.

It wasn't the futuristic marvels of this $102,310 car—the expansive touchscreen display that covers much of the dashboard; rapid-heating, massaging, and ventilating front seats; the Burmester 3D surround sound that was so precise it had me discovering new sounds in songs I've sung for years.

No. What stood out was a simple fact that hit me while I was in the parking lot of a Gelson's.

As a longtime New Yorker and devout noncook, I generally go for years between grocery store visits. It's a particular thrill. But events on Thanksgiving Day conspired to send me scurrying to the nearest supermarket in the EQS, pushing a cart laden with last-minute Pyrex and tinfoil and the panicked mien of a host with family awaiting a feast.

As I aimed the key fob from across the lot to open the EQS's cavernous hatchback trunk, I thought about how I'd driven it twice to the airport and back, taken it up the Pacific Coast Highway for a sunset ride, and steered it through the dust-dry hills of Calabasas and past Christmas-lit shops on Rodeo Drive. For days, I'd commandeered it as primary transport for all the activities one tends to plan for visiting relatives. And not once had I thought to recharge the darn thing.

Saying a silent prayer, I slipped behind the steering wheel and saw more than 100 miles remained as available driving range. Thank God! (Or Daimler.) I whipped it around—the EQS is more than 17 feet long, but can do a U-turn in less space than a Toyota Camry—and forged into traffic.

The EQS has a 485-mile driving range—besting the Tesla Model S's 412 miles and Porsche Taycan's sub-300 miles, though a bit short of the 516 miles promised by the $139,000 Lucid Air GT. It's so exemplary, and the car so capable, that range anxiety was limited to that one brief parking lot panic. It will charge to 80% of capacity in 31 minutes with DC fast charging, which is about the going rate.

My 6-foot-7-inch brother and his 5-foot-10 fiancée loved the wide power-tilt panorama dual sunroofs that his head didn't even come close to grazing, and the 44 inches of legroom across the plush rear seats. We all appreciated the HEPA filtration system and airtight seal of the car itself. It feels like being at a serene health spa.

But throwing family members into a car reveals gripes, too. The elevated floor in the rear (because of the placement of the battery pack and overall car proportions) meant Baby Brother's knees rested at an uncomfortable level. The high shoulder line of the side and rear compromised visibility for all of us.

The driver's window also had a mind of its own, opening and closing erratically as if receiving countercommands from an extraterrestrial guide. Motorized door handles that pop out when sensing the key approaching proved more confusing to my parents than efficient. And let's not even get started on the styling, which resembles a 5,800-pound whale trying to go unnoticed. Family members over the age of 60 loved it—and those under 40 didn't.

I could get past the looks, but not the brakes, which lacked so much bite it was downright discombobulating. That's because Mercedes engineers have set the brake pedal to synchronize with whichever level of energy regeneration you've chosen. Since the brakes automatically deploy as soon as you lift off the accelerator, the idea is that the pedal position will automatically match the car's deceleration rate as it slows. But when I applied more pressure to the brake pedal myself, for a quicker stop, it felt like pressing my foot through putty.

At 329 horsepower and 419 pound-feet of torque, with a zero-to-60-mph sprint time of 5.9 seconds, the EQS is seconds slower than the likes of the Model S and Taycan. (Those numbers define the base EQS 450+ I drove. The higher-end EQS 580 4Matic gets 516 hp and 631 pound-feet of torque and goes zero to 60 mph in 4.1 seconds, which still trails the Tesla and Porsche in a sprint.)

I don't think that will matter to most EQS buyers. Activated, sensual, engaged driving is not the point here. What Mercedes is providing is a spacious, powerful, elegant, and advanced saloon that makes its passengers feel comfortable and confident—and also happens to be electric. The EQS is not perfect, but it's good. Time spent in its confines felt like an escape from the banalities of daily life. After my grocery store run, I took the long way home. B

COURTESY MERCEDES-BENZ

Home Slice

The Karu 16 pizza oven gives you all the tools to make pro-grade pies on your patio

By Matthew Kronsberg
Photograph by Hannah Whitaker

The pizzas Dan Richer serves at his restaurant Razza in Jersey City, N.J., are among the best in the country. Replicating them at home—whether it's a simple Margherita or a Di Natale bedecked with pine nuts, olives, and raisins—just got easier, and not only because instructions for making them are in Richer's new book, *The Joy of Pizza*. Unusually, the tome includes recipes tailored to cooking in pro-grade backyard ovens, like Ooni's $799 Karu 16 Multi-Fuel. Hitting 950F in just 15 minutes, it's the first and only oven that the Associazione Verace Pizza Napoletana, the organization that codified rules for Neapolitan-style pies, has endorsed for home use.

THE COMPETITION

• Breville's Smart Oven Pizzaiolo can go one place Ooni's ovens can't: indoors. The countertop-scaled $1,000 device can reach a blistering 750F right in your kitchen and turn out a 12-inch pie in about two minutes.

• The $159 Baking Steel Plus is a 22-pound, 20-by-15-inch hunk of heavy metal. Stick this quarter-inch-thick slab of food-grade steel in your existing oven and it can absorb and retain more heat than a pizza stone.

• While pizza ovens tend to be standalone specialty appliances, GE Profile's Innovation Studio offers one that's integrated with a standard five-burner range. The $3,500 Trattoria has settings for pies ranging from New York-style to frozen.

THE CASE

Where the Karu 16 stands out is in its heat-source flexibility: You can use wood, charcoal, or, with additional attachments, gas or propane. Its 16-inch cordierite stone deck makes it possible to bake larger pizzas, but the practical use is to give yourself room to maneuver 12-inch pies for a more even bake. A bottom-hinged door with a window allows you to monitor progress without letting heat escape, while a built-in display helps maintain a target temperature. And at roughly 32 inches deep, 20 inches wide, and 32 inches tall (including a removable 18-inch-tall chimney), the 63-pound oven is built robustly enough to live outdoors but portable enough to take tailgating. *$799; ooni.com*

Corporate Profits Reach Record Highs

By Justin Fox

U.S. corporations pulled in more profits in the three months ended in September than ever before. Not just in dollar terms—something that happens frequently—but as a share of the economy. According to initial estimates from the U.S. Bureau of Economic Analysis, third-quarter after-tax corporate profits from current production amounted to 11% of gross domestic product. The previous record of 10.7% was set in the second quarter of this year; before that the all-time high was 10.6%, in the first quarter of 2012.

How high did they get before that? In the quarterly data, which go back to 1947, after-tax profits never topped 9% of GDP before 2010. In annual data they did reach 9.1% in 1929. That ill-starred precedent has at times raised concerns that high profit shares are unsustainable, a sign of an economy tilted too far in favor of corporations and their shareholders.

During the last business cycle—in the 2010s—for example, some of the profit gains came at the expense of employee compensation. That's less the case now. Lower taxes are a factor, as are low interest rates.

By far the biggest change since the beginning of the pandemic has been the large government subsidies for businesses, such as the Paycheck Protection Program and the Restaurant Revitalization Fund. Subsidies amounted to 0.4% of GDP in the first quarter of 2020, 5.8% in each of the next two quarters, and 2.4% last quarter. That share will continue to decline. Given that corporate profits have risen even as the subsidy boost has faded, though, this won't necessarily spell the end of the profit boom. Ⓑ *—Fox is a columnist for Bloomberg Opinion*

● PAY GAP
Employee compensation, including health care and pensions, is 54.9% of GDP, close to the long-run average. But wages and salaries, at 45.1% of GDP, are still below the historical norm.

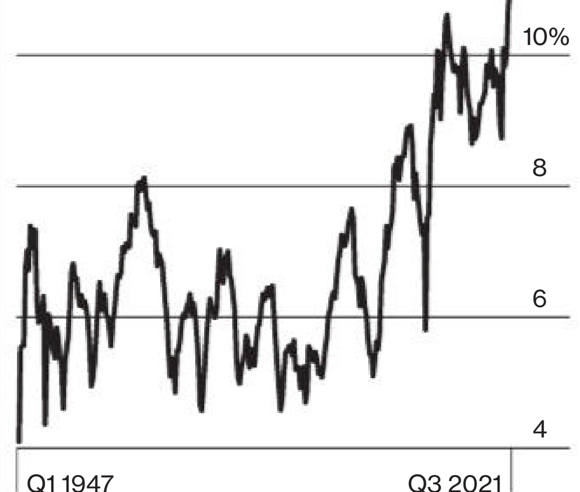
● TAX CUT
Corporate income tax payments added up to

1.7%

of GDP in the third quarter—up from pandemic lows, but well below the 5% average of the 1950s and 4% of the '60s.

● CLOSE, BUT
At 12.7% of GDP, pretax corporate profits are just a little short of the all-time record of 13.1% set in 1950.

● After-tax U.S. corporate profits as a share of gross domestic product



● FARMED OUT
Family farm income is now 0.5% of GDP. In the first quarter of 1947 it was 6.6%. The modest shift to corporate farm ownership explains only a small part of the decline.

ILLUSTRATION BY GEORGE WYLESOL. DATA: U.S. BUREAU OF ECONOMIC ANALYSIS

Bloomberg Businessweek (USPS 080 900) December 13, 2021 (ISSN 0007-7135) H Issue no. 4723 Published weekly, except one week in February, April, May, June, July, August, September, October and November by Bloomberg L.P. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Executive, Editorial, Circulation, and Advertising Offices: Bloomberg Businessweek, 731 Lexington Avenue, New York, NY 10022. POSTMASTER: Send address changes to Bloomberg Businessweek, P.O. Box 37528, Boone, IA 50037-0528. Canada Post Publication Mail Agreement Number 41989020. Return undeliverable Canadian addresses to DHL Global Mail, 355 Admiral Blvd., Unit 4, Mississauga, ON L5T 2N1. Email: contactus@bloombergsupport.com. QST#1008327064. Registered for GST as Bloomberg L.P. GST #12829 9898 RT0001. Copyright 2021 Bloomberg L.P. All rights reserved. Title registered in the U.S. Patent Office. Single Copy Sales: Call 800-635-1200 or email: bwkcustserv@cdsfulfillment.com. Educational Permissions: Copyright Clearance Center at info@copyright.com. Printed in the U.S.A. CPPAP NUMBER 0414N68830

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11-IB21-1505