Bloomberg Businessweek

November 8, 2021

CEO
Anne Wojcicki

The spit-tube startup wants to be a big-time drug company 58

Tech Goes Green

How Gaming and Streaming Fit into a Low-Carbon Future

Every time someone streams a video, posts a picture or powers up a game, a computer's memory chip is used. Although each click draws a seemingly insignificant share of power, when added together worldwide, these requests and processes require an enormous amount of energy.

As the demand to process ever-increasing volumes of data grows, the energy needed to support that data comes with a significant carbon footprint. With digital processes continuing to proliferate, information and computing technology is expected to account for up to 20% of global energy demand by 2030.

To lessen the impact of energy consumption on the environment, it's important to start with the biggest users of memory chips: data centers.

The future needs more efficient data centers

Data centers have an outsized impact on the planet. All the data sent over networks and the internet—videos, email messages, streaming games, music—is stored on a growing number of solid-state drives (SSDs) and hard disc drives (HDDs) in data centers. Keeping these data centers running 24/7 and cooling the equipment takes a vast amount of energy: Data centers currently consume around 1% of global energy production, but could end up using more than 20% of global energy by the early 2030s unless the industry makes some big changes.

That's why Samsung has invested considerable effort to produce more sustainable memory chips that can save energy in data centers and reduce its overall environmental footprint.

"For decades, Samsung has been striving to incorporate environmental sustainability into every aspect of the semiconductor manufacturing process," says Seong-dai Jang, Senior Vice President and Head of the DS Corporate Sustainability Management Office at Samsung Electronics. "We'll continue to pursue more environmentally sustainable policies, beginning at the product development stage and across the entire production and supply chain."

Data centers use both HDDs and SSDs to store data. HDDs store data using spinning disks, while SSDs utilize flash

memory. Without moving parts, SSDs generate less heat and typically consume less than half the power of HDDs.

But not all SSDs are the same. Samsung SSDs feature industry-leading power efficiency; replacing all the world's server HDDs with Samsung SSDs could save an estimated 3 terawatt hours (TWh) of power annually, while replacing all DDR4 server DRAM with the latest Samsung DDR5 DRAM could save an additional 1 TWh. As data centers become more efficient, the energy required to cool their servers will also decrease significantly. The total energy savings of around 7 TWh gained from using low-power memory chips would be enough to power all households in New York City for four months.

Low-impact manufacturing

The environmental impact of data centers goes beyond their power usage, and includes the power and resources used to make the chips. As the world's demand for semiconductors surges, the amount of power and water required to create these complex chips has also increased. Samsung is leading the way in creating cutting-edge chips in an eco-friendly way—by using extremely fine and precise patterning technology that can reduce the number of steps needed to print microscopic circuits, while enhancing both chip performance and energy efficiency.

Samsung's global sites are also managed as greenly as possible by using 100% renewable energy for all its operations in the U.S., Europe and China; the company is presently adding solar arrays and geothermal power generation to its South Korean manufacturing campuses at Pyeongtaek, Giheung and Hwaseong.

Semiconductor manufacturing typically requires large amounts of ultra-pure water. To lessen the impact on the planet, Samsung uses advanced filtration technology to recycle and reuse the wastewater; in 2020, Samsung reused about 70 million tons of water, 12% more than the year before. Samsung has also reduced wastewater sludge—a byproduct generated in the treatment of industrial waste—by using alternative materials and optimizing their use so there is less waste.

Additionally, Samsung has expanded its efforts to eliminate waste in landfills by developing innovative waste management and operational processes, such as recycling wastewater sludge and resin. Samsung received a Gold Level Zero Waste to Landfill validation from UL, a global safety science leader, for all of its semiconductor operation sites worldwide. This signifies that Samsung's semiconductor sites in South Korea, U.S. and China meet the requirement of more than 95% waste diversion through methods that do not involve thermal processing. Samsung's DSR building in Hwaseong, Korea, home to most of Samsung's local semiconductor research and development, also received a platinum-level validation from UL for 100% waste diversion.

These efforts helped Samsung's nine semiconductor facilities to become the first semiconductor sites to earn the Triple Standard for carbon, water and waste, awarded by the U.K.-based Carbon Trust in June. In the past year, 14 of Samsung's memory and logic products also earned carbon footprint certifications from the Carbon Trust, which review each product's carbon impact, from the raw material extraction stage through production, distribution, use and disposal.

"We are committed to improving environmental sustainability across our semiconductor business operations through the continuous reduction of our carbon footprint," says Chanhoon Park, Executive Vice President of Global Infrastructure Technology at Samsung.

◀ Schnatter says he was unjustly let go, and he's been railing about it on right-wing media ever since

PHOTOGRAPH BY TAMARA REYNOLDS FOR BLOOMBERG BUSINESSWEEK

FEATURES

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■ COVER TRAIL

How the cover gets made

❶
"So this week we've got a story about how 23andMe is leveraging its DNA data to take on Big Pharma."

"I sent them my spit a few years ago! We also sent a photographer to shoot Anne Wojcicki, the CEO."

"Oh! Can't wait to see."

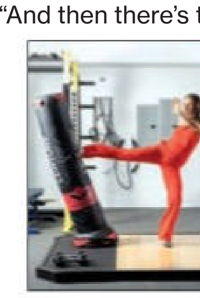
❷
"First up, she's in the lab."

"Got something with more oomph?"

"On a beanbag."

"Better!"

"And then there's this."



"YES!! You're lucky I wasn't sipping water because I would have spit it all out."

"That's exactly what they want from you."

↓

Cover:
Photograph by McNair Evans for *Bloomberg Businessweek*

ECONOMICS: MAIKA ELAN/BLOOMBERG

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IN BRIEF

● Global coronavirus cases have topped 247 million, and 7.1 billion vaccine doses have been given, but

5m

have now died. Pfizer moved closer to offering the Covid-19 shot it developed with BioNTech to kids age 5 to 11 in the U.S. after getting backing from regulators. The drug is expected to generate about $36 billion in revenue this year.

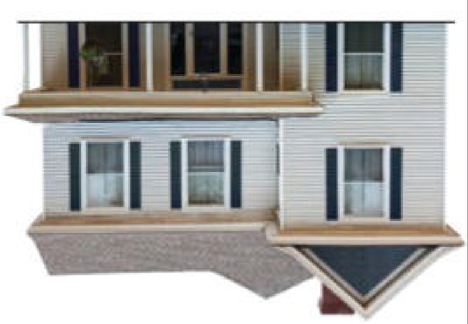
● **The Fed said on Nov. 3 that it will trim its monthly asset purchases by $15 billion.**

Buying fewer Teasuries and mortgage-backed securities, the central bank will begin winding down its program to shield the U.S. economy during the pandemic. The Fed also decided, unanimously, to maintain the target range for its benchmark policy rate at zero to 0.25%.

● As Ethiopian government troops tried to halt Tigrayan rebels advancing toward the capital of Addis Ababa, Prime Minister Abiy Ahmed declared a state of emergency for six months. The move allows the army to conscript any able person.

● **The U.S. sued to block Penguin Random House's deal to buy Simon & Schuster.**

Antitrust regulators argued the combination would give Penguin too much control over book publishing and how much authors are paid. Penguin parent Bertelsmann had agreed to acquire Simon & Schuster from ViacomCBS for $2.18 billion last year.



● Zillow ditched its home-flipping operation after the complex algorithm caused it to overpay on houses. The company will take writedowns of as much as $569 million and cut its workforce by 25% while it winds down the business in coming months.

● **"We now have a subprime carbon bubble of $22 trillion, based on an absurd assumption that all of those carbon fuels are going to be burned."**

Former Vice President Al Gore, speaking from the COP26 climate summit in Glasgow, Scotland.

● **Investors want in on EVs.**

AVIS

Shares in Avis more than tripled on Nov. 2 as investors bought into the promise of a greater focus on electric cars in the auto-rental company's fleet.

Hertz

Hertz said it's started taking delivery of Teslas as part of its deal to buy 100,000 vehicles. Elon Musk caused a brief stir by saying no deal had been signed yet.

RIVIAN

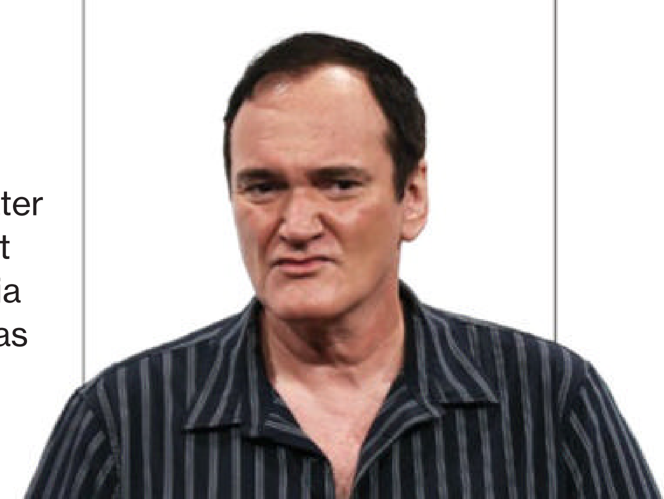
Rivian Automotive is seeking to sell shares later this month in an IPO that could value the California electric-truck maker at as much as $60 billion.

● Zimbabwe's benchmark stock exchange is up more than

360%

this year, making it the best-performing market in Africa in 2021. Investors are piling into stocks as a haven against inflation, which was almost 55% in the country last month.

● Director Quentin Tarantino plans to auction off seven never-before-scenes and handwritten scripts from *Pulp Fiction* using nonfungible tokens. The material will be accessible only to the owner of the NFT.



ETHIOPIA: ERBERTO ZANI/ALAMY. HOUSE: GETTY IMAGES. TARANTINO: ERNESTO RUSCIO/GETTY IMAGES

How the U.S. Can Avoid A Nuclear Race As China Adds Arms

After decades of sustaining a relatively modest nuclear arsenal, China is moving swiftly to build more and better doomsday weapons. The trend would be dangerous at any time. But given the precipitous decline in relations with the U.S., a catastrophe is becoming all too likely. Both sides need to restore stability to this relationship before the world faces a devastating new nuclear arms race.

China's amped-up nuclear ambitions have been hard to miss in recent months. Satellite images suggest the country has been building fields of new intercontinental ballistic missile silos. It's deployed ICBMs that are harder to target and faster to launch. It's been bolstering its fleet of ballistic-missile submarines and developing nuclear-capable bombers. More exotic weapons, including a hypersonic system China tested over the summer, might one day evade U.S. missile defenses. Chairman of the Joint Chiefs of Staff Mark Milley described the tests as "very close" to a Sputnik moment. The Pentagon predicts that China's stockpile of operational warheads will more than double by 2030.

These advances are potentially destabilizing, especially given the murkiness of China's nuclear goals and doctrines. There is ambiguity about its pledge never to use nuclear weapons first as well as in talk of shifting some missiles to hair-trigger, "launch on warning" status. The risks of conflict are rising. China's leaders may feel more comfortable waging a conventional war over Taiwan if they're confident they've achieved a nuclear stalemate with the U.S. Their refusal to discuss these issues, let alone engage in arms-control talks, deepens mistrust.

In responding to this reality, the U.S. will have to strike a delicate balance. On the one hand, it needs to maintain its deterrent. President Joe Biden's administration should continue bipartisan efforts to upgrade the Navy's fleet of ballistic-missile submarines, while the Air Force should work on developing unmanned means of delivering nuclear weapons, including drones and air-launched missiles, in addition to buying B-21 bombers. On the other hand, the White House needs to keep the threat in perspective. Even if China quadruples its stockpile, it will still lag far behind the 3,750 warheads in the U.S. arsenal. Moreover, several of the policies China is moving toward—including launch-on-warning and a full-fledged nuclear triad—are already standard for the U.S. and Russia.

It's essential for the Pentagon to avoid overreaction. A focus on bolstering conventional capabilities would be wise. The best way to prevent war over Taiwan is to convince China that the costs would be prohibitive. That will require equipping U.S. forces with new long-range antiship missiles, surface and undersea drones, and resilient battlefield networks. The U.S. should also deepen coordination with allies such as Australia and Japan while ensuring Taiwan has the weapons and training necessary to hold out until help can arrive.

Most important, when Biden meets his Chinese counterpart, Xi Jinping, by video later this year, he should underscore the need to stabilize the broader U.S.-China relationship. China may well calculate that keeping the U.S. guessing about its intentions confers a strategic advantage. But Biden should emphasize that better relations will remain elusive if China engages in an unchecked nuclear competition. To build trust, the two sides should develop stronger crisis mechanisms and work toward the possibility of formal arms-control talks later.

The U.S. and the Soviet Union needed the Cuban missile crisis to appreciate the value of nuclear transparency, diplomacy, and communication. There's no need to go through that again. Ⓑ *For more commentary, go to bloomberg.com/opinion*

■ AGENDA

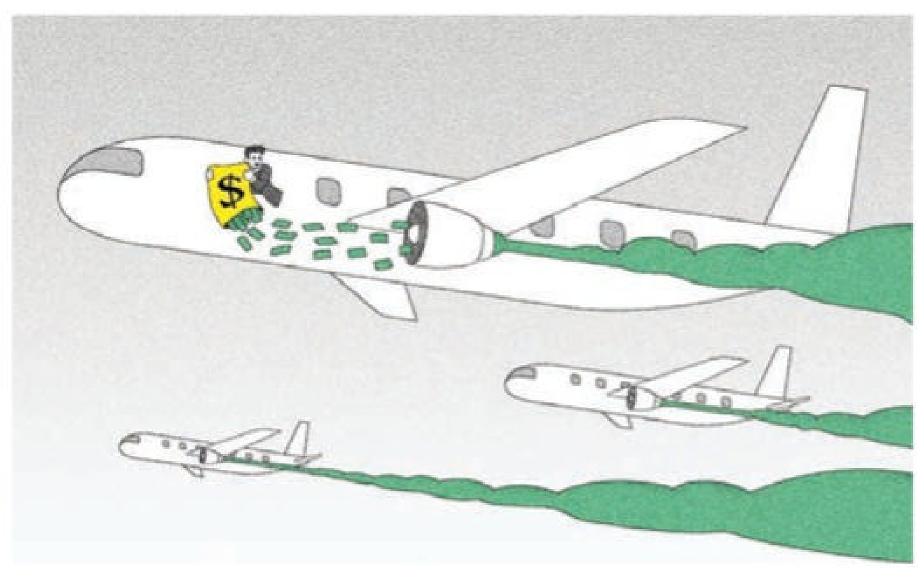


ILLUSTRATION BY MARIO MENESES

► Up, Up, and Away?

The Dubai Airshow, the first major expo since the pandemic grounded the entire aviation industry, kicks off on Nov. 14. The event will be an important barometer of the demand for flights, particularly long-haul journeys.

► The European Central Bank holds an online banking supervision forum Nov. 9-10. Among the participants: The ECB's Christine Lagarde and Santander's Ana Botín.

► SuperReturn, in Berlin Nov. 9-12, is the world's largest conference for the private equity and venture capital industry, which has seen record deal flows this year.

► Heads of state and company leaders will convene Nov. 11-13 at the Paris Peace Forum to talk about global governance, security, and the pandemic response.

► Argentina holds legislative elections on Nov. 14. Voters will choose half the seats in the Chamber of Deputies and a third of the seats in the Senate.

► The Abu Dhabi International Petroleum Exhibition & Conference, Nov. 15-18, hosts representatives from the energy industry to discuss the continued rise of oil and gas prices.

► SoftBank reports its second-quarter earnings on Nov. 8. In recent months the Japanese conglomerate has been busy selling assets in telecommunications, chips, and defense. ▷ 34

■ REMARKS

Now Crypto Is Barking at Me

● The Shiba Inu coin craze sparks demand for the namesake puppies

● By Claire Ballentine

With virtual life increasingly indistinguishable from everyday reality, it makes sense: Just as the price of dog-inspired cryptocurrencies Dogecoin and Shiba Inu coin have exploded, so has demand for—what else?—living, breathing shiba inus.

While Dogecoin, the cryptocurrency created from a meme back in 2013 using the image of a shiba inu, enjoyed a burst of popularity this summer, it was recently overtaken in market value by the slightly less creatively named Shiba Inu coin. In classic crypto style, it sounds like a joke but is immensely valuable, with investors pushing up its price almost 800% in the past month, even though a coin still costs a tiny fraction of a cent.

At the same time, shiba inu breeders across the U.S. say they're seeing more business than ever since cryptocurrency trading brought the Japanese hunting dogs into the limelight.

Credit Elon Musk, crypto godfather and the richest man in the world, for some of that rocket-ship-emoji action. His recent tweets of his new shiba inu puppy, Floki, ignited speculation that he'd invested in Shiba Inu coin himself, sending its price rallying and even sparking the creation of more dog coins with the name "Floki" involved. Users of Robinhood are calling on it to list Shiba Inu coin—the brokerage already allows trading in Bitcoin, Ethereum, Dogecoin, and Litecoin—and a petition to that effect has more than 450,000 signatures.

Seth Johnson, who works in IT in northern Mississippi, is one of the proud new owners of a shiba inu, purchased in June with $2,500 in U.S. dollars. (His breeder did not accept crypto.) He didn't know much about the dogs until Dogecoin took off, and the more recent hype over Shiba Inu coin only heightened his interest. Johnson is a big believer in an obscure coin called EverRise, which became the name of his new pet.

Even with so much of our daily lives taking place in online worlds, it's still unsettling to see the physical manifestation of a digital trend. Whenever I take my one-year-old cocker spaniel, Riley, to a dog park in New York City, there's always at least one shiba inu there alongside the dozens of other puppies purchased during the lonely days of lockdowns. Crypto is in everything from music to fashion to fast food; it's now also barking at me.

For those who had shiba inus even before the meme coin madness, the newfound attention is profoundly strange. "People will ask to take a picture with her," says Allyson Kazmucha, about her shiba inu, Kaya. "They'll say, 'Is that the Doge dog?' " Kazmucha, an engineering programs manager in San Jose, got her dog in 2012 before Dogecoin was created. "They seemed to be the perfect size and not super clingy or high maintenance," she says. "I definitely didn't realize that crypto would be a thing when we got her." Eventually the meme became so inescapable that she decided to buy some Shiba Inu coin herself. "It felt very on-brand," she says.

The collision of the crypto and canine worlds is confounding small breeders as well. Inquiries have more than tripled at Rodel Shibas in Aspers, Pa., says co-owner Sandra Rolenaitis. "You've got Elon saying he got a shiba inu, and then it snowballs." She now receives about 150 to 200 applications a month for her dogs. Rolenaitis says it's impossible to keep up with inquiries, let alone provide a dog to everyone interested (the average shiba inu litter is three puppies). Adding to the workload is that many people don't have a clue about the breed's personality. Rolenaitis describes them as "the closest to a wolf you can get, like a 125-pound dog in a 25-pound package."

"Sometimes I'll get a family that just wants them because they're popular," says Stephanie Abel of Tintown Shibas, a breeder in Dover, Ohio. "So I have to go through and tell them all the bad stuff about the dogs, and when I tell them all the bad stuff, they run away."

Ali Smith, founder of Rebarkable, a dog training company in Westminster, Md., describes them as more like cats than dogs. "Their instincts are quite close to the surface, and they can be difficult to train, because they are quite aloof," she says. Are there parallels to the crypto world here? The people behind counterculture meme coins bill themselves as an alternative to traditional finance and have the determination to move prices up using sheer willpower.

There's a history of popular culture driving pet purchases. Back when Walt Disney Co.'s live-action version of *101 Dalmatians* premiered in 1996, real puppies were given as Christmas gifts, which later prompted a spike in pups at animal shelters after families realized that dogs of this breed tend to bite and often don't like children.

Zennia Barahona, president of NYC Shiba Rescue, compares it to the explosion of clownfish after *Finding Nemo* came out. She's seen an influx of dogs this year, which she attributes to the cryptocurrency madness colliding with the breed's notoriously stubborn personality that makes them less than ideal for many families.

Shiba inus ranked No. 43 on the American Kennel Club's list of most popular breeds in 2020, up from 45 in 2019. So the breed is still a fringe interest, just like Shiba Inu coin trading, for now.

But the morphing of an online phenomenon into a real-life trend is something that's likely to proliferate as the idea of a "metaverse" gains traction. This 3D world where people can work, socialize, and shop through virtual reality will be the aim of Mark Zuckerberg's Facebook rebrand called Meta Platforms Inc.

The formation of a metaverse combining crypto, blockchain, digital gaming, and nonfungible tokens will be a gradual process. The clash between our online personas and our real-world selves will be a critical tension in that evolving story. When enthusiasm for a digital token engenders purchases of a living animal, we're starting to experience the new state of fluidity in our digital and physical worlds. Tangible objects can never be part of the metaverse, but their virtual forms are, and that will influence how we think and talk about them offline.

It also shows the limitations of the metaverse, no matter how many big tech companies pour cash into it. No digital avatar can replace a real-life puppy. Ⓑ

PHOTO ILLUSTRATION BY 731; PHOTOS: ALAMY (2); GETTY IMAGES (20)

ILLUSTRATION BY JORDAN SPEER

UPS Is Winning the Delivery Wars

FedEx's nonunion workers and contractor drivers were supposed to give it an edge. Nope

Dave Helminski will drop off his last package for United Parcel Service Inc. on Christmas Eve 2022 and retire after four decades as a driver in Chicago. He joined UPS after four years in the Marine Corps and a yearlong stint installing carpet. He put in a few years loading trucks, then became a driver and was set for life. After Helminski drops off that last package, he'll have pensions that provide almost the same $100,000 a year he makes now. "I came out of the lower middle class, and I'm living the dream," Helminski says, as he heads home from his shift at a large UPS facility in the northern suburb of Palatine.

Helminski's dream industry has lately become more of a nightmare scenario at rival FedEx Corp. The massive labor shortage that's rocked the U.S. since the pandemic and disrupted long-established employment relationships hasn't had much impact on UPS, which pays its unionized drivers the highest wages in the industry. That's helped it maintain a stable workforce and rising profits throughout the current disruptions. Meanwhile, lower-paying, nonunionized FedEx racked up $450 million in ▶

Edited by
James E. Ellis

◀ extra costs because of labor shortages. And while UPS easily beat earnings expectations and predicted a rising profit margin in the U.S. for the fourth quarter, FedEx signaled that its profit margin will fall further. The lack of workers is taking a toll on its reliability, too. FedEx's recent on-time performance for express and ground packages has sunk to 85%, while UPS has met deadlines on 95% of those packages, according to data collected by ShipMatrix Inc.

With strong package demand and delivery prices jumping more than 10%, FedEx's struggles have left investors puzzled, says Amit Mehrotra, an analyst at Deutsche Bank AG. The company's travails have laid bare structural inefficiencies in its business model, too. Unlike UPS, FedEx operates two distinct delivery networks: one for its overnight air delivery business, which is handled by FedEx employees, and another for its ground parcel service, which uses independent contractors to make final-mile deliveries employing their own nonunion drivers.

Refined by FedEx founder Fred Smith, the model was supposed to benefit the company by pushing variable labor costs and the expense of vehicles to the contractors that operate local routes. And it worked well in a market dominated by commercial packages, Mehrotra says. But the ground parcel business has expanded rapidly with the growth of e-commerce in the past decade, resulting in far more residential deliveries. Such home service requires the contractors handling those deliveries for FedEx to drive more miles between stops and leave fewer packages at each location, boosting costs. When the pandemic hit, residential deliveries exploded, forcing contractors to hire more drivers and FedEx to add more package handlers. "There's definitely been a loss of confidence in this business" among FedEx investors, Mehrotra says. "There's something wrong."

Smith agreed to acquire the ground network in 1997. His use of contractors allowed FedEx to expand the business quickly without the expense of buying vehicles or managing drivers. FedEx Ground became the company's growth engine, posting profit margins in the midteens. But the pandemic led many U.S. workers to question whether jobs with low wages and challenging work conditions were worth returning to. FedEx, Amazon.com Inc., and other companies that pay their operational employees wages and benefits lower than those received by many unionized workers are struggling to hire people even though they're now raising salaries. FedEx Ground has seen average wages for workers in its sorting facilities jump 16% from a year earlier.

FedEx has warned that its labor problems will persist into this quarter, and analysts predict the ground unit's operating margin will sink to 6.8%, from 7.5% a year earlier. Analysts expect UPS's fourth-quarter profit margin for its U.S. domestic business will rise to 9.9%, from 8.8% a year earlier.

The difference in performance predates the worker shortage. Even while paying union workers almost twice what FedEx Ground drivers make, UPS earns a return on invested capital that's more than double its rival's. In the last full year, UPS and FedEx each had sales of about $84 billion; UPS banked $7.7 billion of operating income, while FedEx earned $5.9 billion. Investors have taken note: UPS shares have risen 27% this year; FedEx's have dropped 9%.

Yet, while Smith has been able to hold union organizers at bay by relying on contractors, FedEx Ground's savings on labor lately hasn't filtered down to the bottom line. That's because its 5,600 contractors are mom and pop outfits, who pay full price for vehicles, tires, oil, parts, maintenance, and other items that UPS buys at scale. Each contractor has the same back-office work and often farms it out to third parties, adding to expenses.

FedEx Ground keeps contractors small by design to avoid becoming too dependent on one company in a service area. That lowers the risk when contractors fail. FedEx calls on other contractors to plug the hole in service—paying them extra per package to entice them to send teams to the area.

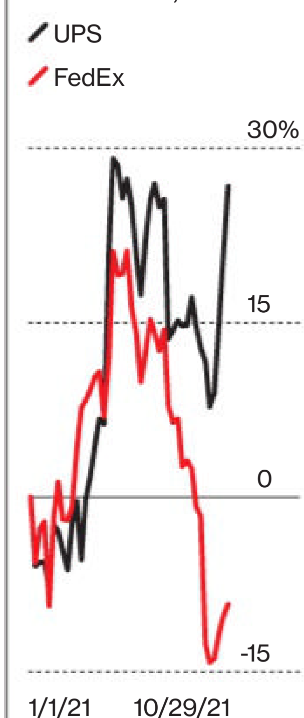
Contractors spend a lot of their time recruiting drivers—turnover ranges from 30% to 60% annually—sometimes poaching from other FedEx contractors. UPS's richer pay package makes it easier for the company to hire part-time workers at sorting hubs, where it offers the incentive of moving into a delivery driver job that can eventually pay, as in Helminski's case, almost $100,000 a year, with overtime. This creates a stable workforce at the hub and a steady pool of driver candidates whose work habits are already known to the company.

FedEx's sorting hub in Portland, Ore., is operating with only 65% of the staff needed. That forces the company to reroute packages to other facilities, incurring costs for the extra transportation and reducing efficiency, officials said in September. In total, FedEx says the ground unit is rerouting 600,000 packages a day because of labor issues.

UPS does have to worry about strikes during labor contract negotiations every five years. The current contract expires in 2023. But for now, UPS and its workers are doing well, says Helminski. "We're making a good living," he says. "We're the gold standard." —*Thomas Black*

THE BOTTOM LINE FedEx racked up $450 million in extra costs during its latest quarter because of labor shortages. UPS's higher-paid unionized delivery drivers helped it avoid such penalties.

▼ Change in share price since Dec. 31, 2020



The Real Payoff From China's Covid Vaccines

● Its drugmakers hope exports of coronavirus shots will lead to sales of inoculations for other diseases

The pandemic made China the world's top exporter of Covid-19 vaccines, mostly to nations that haven't been able to afford or procure more effective ones from the U.S. and Europe. Now the country is using that newfound leverage to make an aggressive overseas push for its vaccines against other diseases such as Japanese encephalitis and pneumonia, competing with giants including Pfizer Inc. and Merck & Co.

Studies have found the Chinese Covid shots to be less effective than some Western ones, such as the mRNA vaccines from Pfizer and Moderna Inc., and there have been repeated questions about the transparency and data standards of its vaccine makers. Even so, developing nations that have had little access to other coronavirus vaccines are poised to grow more dependent on Chinese companies for shots against other ailments.

The expansion marks a dramatic ascent for China's pharmaceutical industry and could give poor nations cheaper access to life-saving shots. It will also help President Xi Jinping's administration wield more soft power globally. Serbian President Aleksandar Vucic has already said Xi may get a statue in the capital of Belgrade for supplying the country with more than 4 million doses of Covid vaccines, supporting local businesses such as the steel industry, and providing geopolitical backing.

China's state-run Sinopharm is a partner in a sprawling factory being built near Belgrade that Serbian Premier Ana Brnabic says "will be able to make vaccines for other diseases…not only in Serbia, but also for export." In Morocco, China's Walvax Biotechnology Co. is selling a vaccine against childhood pneumonia. Other Chinese companies are selling inoculations—for diseases from flu to hepatitis—to places such as Indonesia and Egypt, building on the success of Covid vaccine exports. "China historically has not been a vaccine exporter, so this shift in the midst of the pandemic is one of the ways in which this pandemic has changed the world," says Thomas Bollyky, director of the global health program at the Council on Foreign Relations. "It has enabled China to be a global player in vaccines in a way it has not before, and I suspect that will stick."

Covid has shown just how quickly the Chinese pharma industry can mobilize. China has exported more than 1.5 billion doses of Covid vaccines across the globe, with Sinovac Biotech Ltd. becoming the world's No. 1 provider by shipping a total of 1.9 billion doses at home and overseas, topping Pfizer's 1.5 billion in late September.

That determination is on display at Walvax, which began in 2001 in the southwestern city of Kunming. It started with so little funding that it had to borrow from loan sharks at exorbitant rates to pay salaries. The company went on to participate in government-funded programs to master new vaccine technologies. Today it has a market value of $13.5 billion and sells shots for meningitis, pneumonia, and other diseases in China and overseas.

▲ A Walvax worker with doses of its Covid vaccine

A couple years ago, Walvax Vice Chairman Huang Zhen became eager to challenge Pfizer's leadership in pneumococcal vaccines to protect against childhood pneumonia, whose sales bring the New York-based company $5.8 billion in annual revenue. ▶

JIANG QIMING/GETTY IMAGES; DATA: COMPILED BY BLOOMBERG

◀ For Walvax, accelerating the trials for its own shot was a costly endeavor. To persuade the company to move more quickly, Huang promised to liquidate his stock in Walvax and cover its expenses of 75 million yuan ($11.7 million) if the vaccine failed.

The company went on to introduce a competitor to Pfizer's Prevnar 13 in China in 2020. Its shot sells for 598 yuan per dose there, about 15% less than Pfizer's. The U.S. company has since lost more than 40% of its market share in China for the inoculation, according to government data. Huang predicts similar success for its pneumococcal vaccine in developing nations, where he says it could be an alternative in places unable to secure Prevnar 13. Pfizer declined to comment. Although the company lost market share in China since Walvax introduced its pneumococcal vaccine, volume of Prevnar-13 has still increased 35%, because the market for the shot is getting bigger with new entrants driving more usage of such shots. "In 5 to 10 years' time, some of the Chinese companies will rise as serious contenders globally," Huang says. "Covid really shows the potential of Chinese vaccine makers."

Merck also faces a threat to its blockbuster Gardasil vaccine against the human papillomavirus, which causes cervical cancer. China's Xiamen Innovax Biotech Co. last year began distributing an HPV vaccine in China. The World Health Organization backed the shot in October, paving

◀ A shipment of Sinovac's coronavirus vaccines in Phnom Penh, Cambodia

the way for it to be registered and purchased across the developing world. Innovax already has an agreement to sell to Thailand. "In terms of quality, I'm confident we are not bad at all," says Wendy Huang, Innovax's director of business development. But "it takes time for a Chinese company to become more engaged with the rest of the world."

The high demand for HPV shots from wealthy countries and the limited supply of approved brands have caused setbacks for the WHO's goal to eliminate cervical cancer. International organizations such as Gavi, an alliance to supply vaccines to poor children globally, have already been touting the Innovax vaccine as an option for affordable access. Still, it

▲ Sinovac's Covid vaccine being administered in Banda Aceh, Indonesia

protects against fewer varieties of HPV than Merck's shot. Merck in a statement said Gardasil sales haven't been hurt in China, where demand for the vaccine is high. It said it believes its vaccines bring additional benefits, helping prevent more HPV-related cancers and diseases by covering more HPV types.

Covid shot leader Sinovac is also building a portfolio of vaccines, including some for chicken pox and polio that are being reviewed by the WHO. Sinopharm already sells Japanese encephalitis vaccines in India and Southeast Asian nations. To gain a global footprint for their non-Covid shots, Chinese companies are often selling them for less than Western brands and seeking "prequalification" from the WHO, a widely recognized guarantee of safety and effectiveness for governments in poor countries.

For now, China's main advances are likely to be in low-income countries, meaning its pharma companies will compete mainly with those of low-cost Indian suppliers in the developing world, Bollyky says. Still, questions have persisted over the ability of Chinese Covid vaccines to prevent infections, given their lower efficacy in clinical trials and the number of new cases many countries continue to experience despite mass vaccination. Some nations relying on Chinese vaccines, including Thailand and Brazil, are now turning to more potent mRNA shots developed by Western companies.

The pandemic has also showed that vaccines can be lifesavers for poor nations, even if they aren't the most potent ones available. Chinese companies stepped in to provide hundreds of millions of Covid shots to the WHO's Covax vaccine program for mostly poorer countries when India curbed exports.

"If Africa is a healthier continent and a more prosperous continent because of China," says Barbara Nattabi, a research fellow at the University of Western Australia's Africa Research and Engagement Centre, "that gives China a way in." —*Bruce Einhorn and Dong Lyu, with Misha Savic*

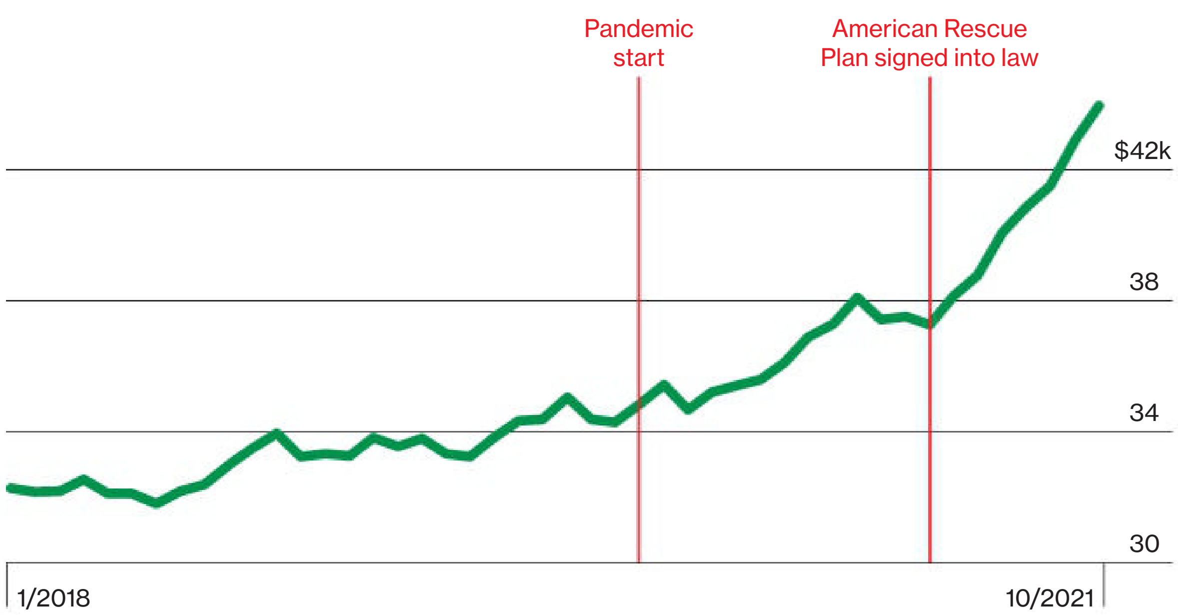
THE BOTTOM LINE Before Covid, China's vaccines were mostly for domestic use. Now it's targeting nations by using its coronavirus jab as an entry point for providing other shots.

TRANSPORTATION: PHEARUM/GETTY IMAGES. INDONESIA: CHAIDEER MAHYUDDIN/GETTY IMAGES

Sticker Shock

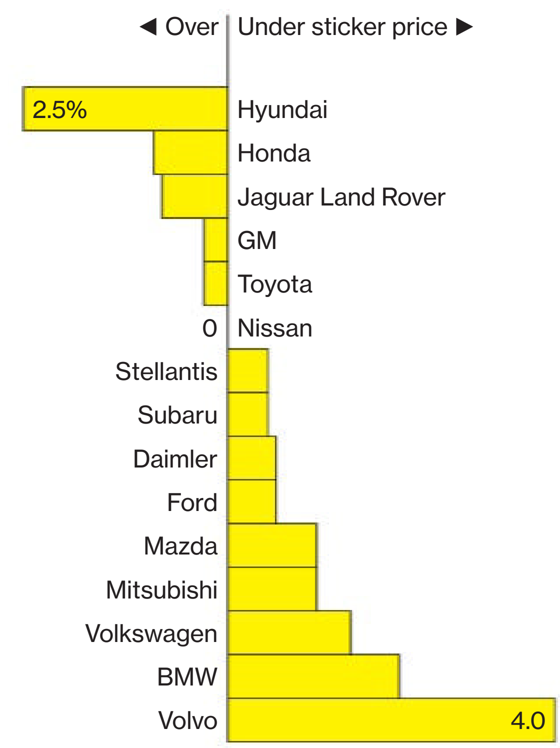
In a year of shortages, the auto industry's turmoil may be unrivaled. Cars have never been costlier nor flown so quickly off lots. Sales rebounded from 2020's pandemic disruptions, only to plunge again when a chip scarcity halted assembly lines.
—*Craig Trudell and Mark Glassman*

Average new vehicle price in the U.S.



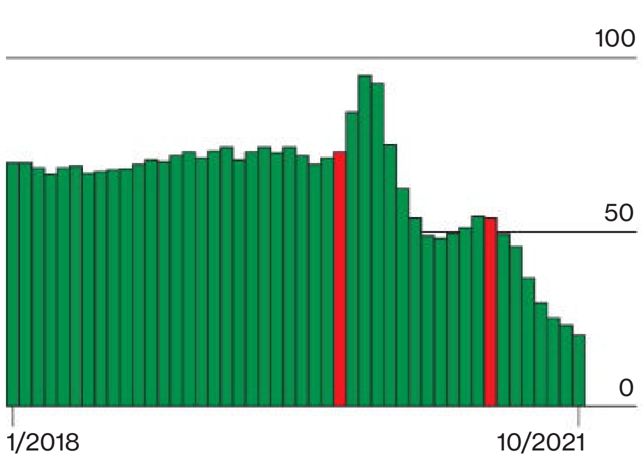
Retail auto buyers in the U.S. got an average discount of just 0.2% from the sticker price in September, down from a 5.5% discount a year earlier.

Retail premium or discount paid by U.S. consumers as a share of sticker price, September 2021



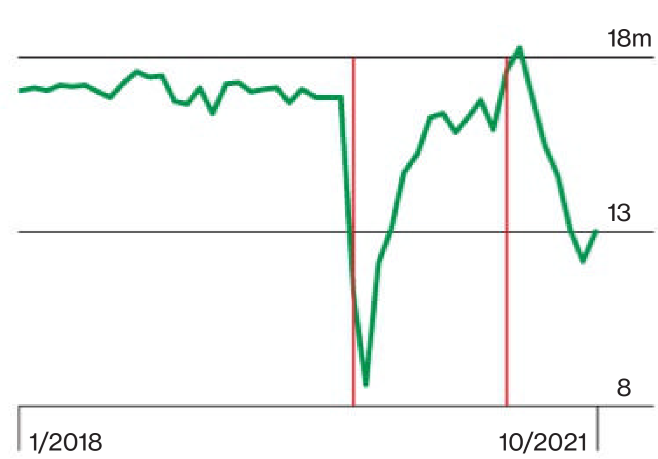
Selling Faster, But Fewer

Average number of days a new vehicle spent at a dealership before being sold



With so few cars and trucks available this year, sales have slumped almost as sharply as they did in 2020, when Covid-19 restrictions in much of the country virtually shut down the industry.

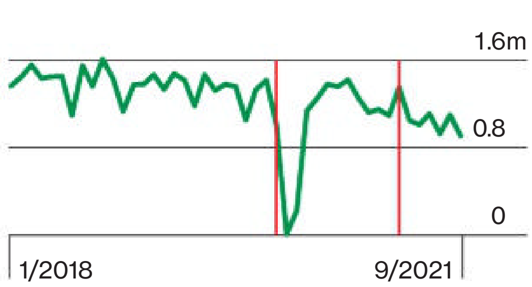
U.S. light-vehicle sales, seasonally adjusted annual rate



And Help Is Not on the Way

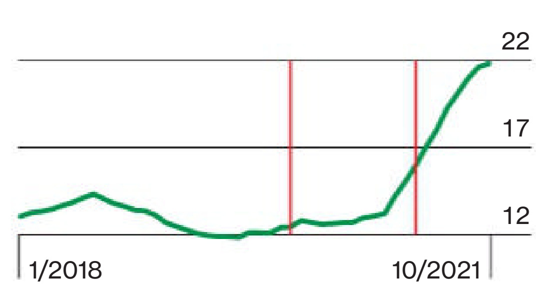
Production has fallen short of expectations every month this year. Through September carmakers built about 2.33 million fewer vehicles than LMC Automotive originally forecasted.

North American light-vehicle production



Chipmakers are still overwhelmed by orders from makers of everything from autos to appliances, so production may be stuck at reduced levels for some time.

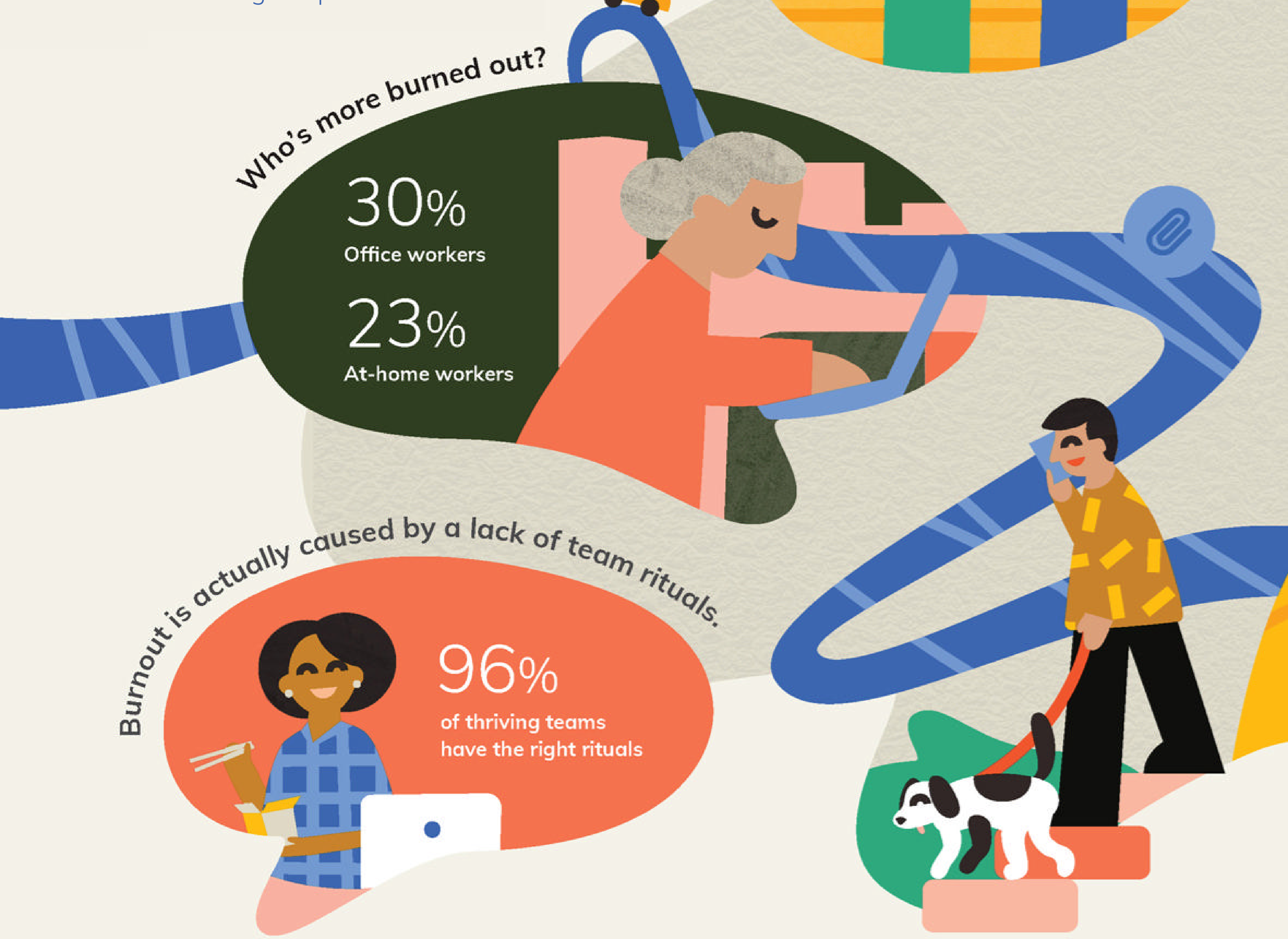
Average weeks from chip order to delivery



KIA: COURTESY KIA MOTORS. HYUNDAI: COURTESY HYUNDAI. DATA: J.D. POWER (PRICE AND INVENTORY); EDMUNDS.COM AND BLOOMBERG INTELLIGENCE (DISCOUNTS); WARDSAUTO (SALES); LMC AUTOMOTIVE (PRODUCTION); SUSQUEHANNA FINANCIAL GROUP (CHIP WAIT TIME)

It's How You Work, Not Where You Work, That Makes Teams Thrive

It's wrong to think that working from home causes burnout. In fact, Atlassian research found that burnout rates are higher for those who have worked in an office during the pandemic.



These are the teamwork rituals that best promote engagement:

Update

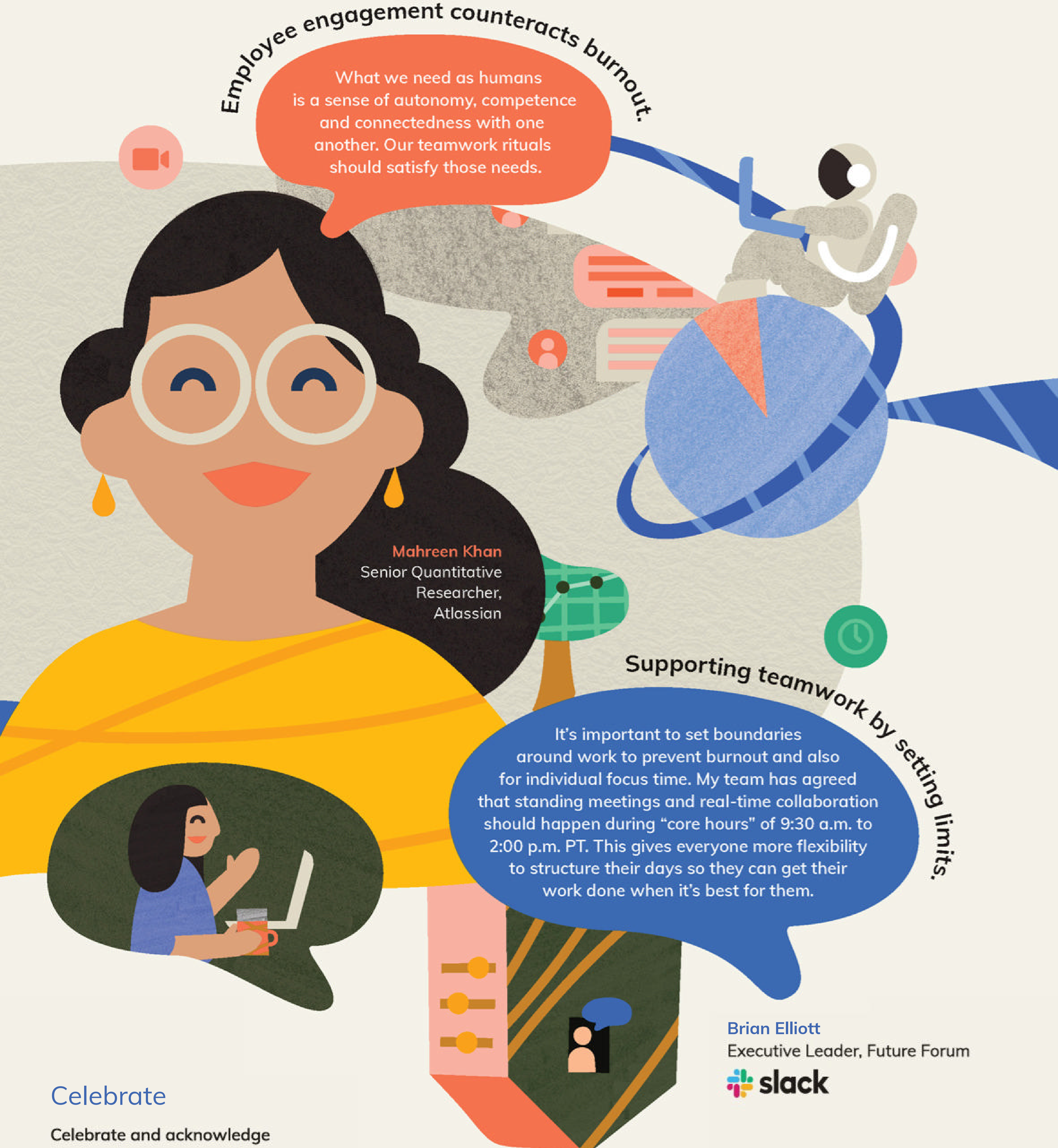
Have team members give brief, regular updates on their tasks and priorities.

Talk

Talk through what's worked and what hasn't, and decide on ways to improve.

Share

Share what the entire team has been working on so that team members can ask questions, share knowledge and offer suggestions.



Celebrate

Celebrate and acknowledge the team's progress and achievements together.

Source: Proprietary Atlassian research, 2021.

ATLASSIAN

Ransomware HQ

Moscow's tallest tower houses multiple companies that experts say are using Bitcoin to launder money

The crown jewel of Moscow's business district, a 97-story glass tower known alternately as Federation Tower East or Vostok, is a tribute to Russia's post-Soviet economic influence and national strength. Promotional materials for the building, which was the tallest in Europe when it was completed in 2017 and is now No. 2, boast of its highly paid staff and its supposed fortification against "missiles and explosions." Its apartments are rented and owned by high-ranking government officials and C-suite executives. Residential units sell for upwards of $36 million.

The building has also been home to more than a dozen companies since 2018 that convert cryptocurrencies to cash, judging from the addresses listed on company websites. Although there's nothing inherently illegal about this, such businesses can enable criminals to cash out profits from digital crimes if they don't vigilantly monitor their customers, and some find lax oversight to be a useful market niche. Experts have linked at least four of the companies in Vostok to money laundering associated with the ransomware industry, which has generated $1.6 billion in ransom payments since 2011, according to the U.S. Treasury Department.

The perception that the Russian government tolerates, or even encourages, some types of cybercrime has been at the heart of the Biden administration's conflict with Russian President Vladimir Putin. According to the Treasury Department, this year criminal hackers, mostly based in Russia or Eastern Europe, have made $590 million from ransomware attacks against schools, businesses, government entities, and health-care providers—42% more than they did in all of 2020. At a summit about a month after a Russia-linked cybergang extracted $4.4 million from Colonial Pipeline Co., Biden warned Putin that failure to end these attacks would be met with retaliation. Nevertheless, profit-driven hackers have continued to target U.S.-based networks.

It's hard to come up with a stronger illustration of the ineffectiveness of Russian enforcement than the existence of multiple entities with links to ransomware operating out of what is perhaps Moscow's most prestigious office tower. One of the Vostok companies is Suex OTC, the first Russian company to face U.S. sanctions for helping ransomware cartels launder money. Suex, which operates out of Suite Q on the 31st floor, has processed at least $160 million in Bitcoin from illicit and high-risk sources since 2018, according to the blockchain ▶

ILLUSTRATION BY JINHWA JANG

Edited by Joshua Brustein

◀ research firm Chainalysis. These transactions account for 40% of the company's known business.

Egor Petukhovsky, Suex's largest shareholder at the time of the Treasury Department's sanctions, denied in a Facebook post in October that he or Suex helped launder money for hackers and vowed to "firmly defend my name in litigation" in the U.S.

An occupant of the 22nd floor, EggChange, is under investigation in the U.S. and Europe for allegations of money laundering, according to three sources familiar with the probe who sought anonymity because they're not authorized to discuss the investigation. (The Treasury Department declined to confirm the existence of the investigation.)

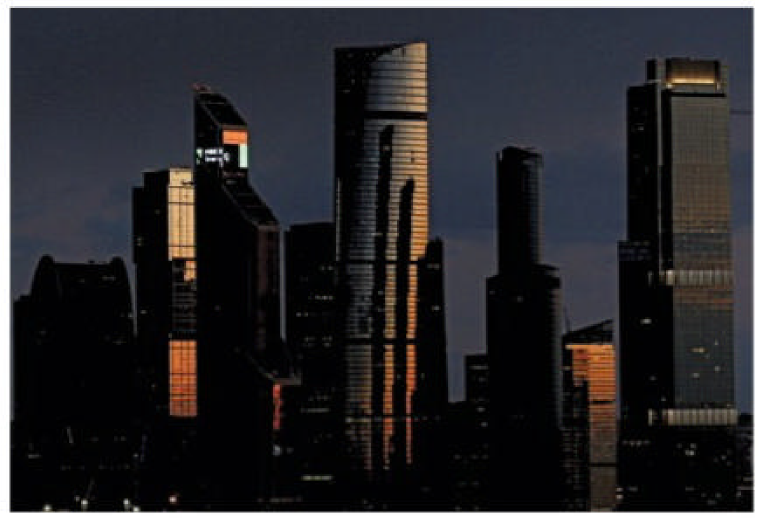
Binance, the world's largest cryptocurrency marketplace, says it has also "flagged several accounts and illicit flows associated with" platforms including EggChange and CashBank, another company operating out of Vostok. After alerting law enforcement of "potentially illicit activities," Binance says it shut down the accounts it identified.

Buy-bitcoin.pro, which also lists Vostok as its headquarters, has processed hundreds of thousands of dollars in ransomware funds and for other illicit operators including Hydra, the largest darknet market based in Russia, according to Chainalysis. EggChange, CashBank, and Buy-bitcoin.pro didn't respond to requests for comment.

Cryptocurrency companies are a major presence in Moscow City, the business district surrounding Vostok. Spreading over about a quarter square mile on the former site of an industrial park that was razed just after the fall of the Soviet Union, the financial district has housed at least 50 companies that convert cryptocurrencies into cash, some with connections to illicit activities. That makes it one of the world's most influential stations for cashing out digital coins, according to cybersecurity and cryptocurrency experts.

Russian law requires companies to conduct know-your-customer, or KYC, checks for cash transactions exceeding 600,000 rubles (about $8,300), although cryptocurrency exchanges aren't regulated and their reporting obligations aren't entirely clear, according to Maria Agranovskaya, a lawyer who represents Binance in Russia. KYC rules typically involve cross-referencing an individual's personal information against public databases; financial institutions can also limit the size of large transactions involving newly created accounts until they're satisfied about the account holder's identity and source of funds.

These requirements aren't particularly onerous, according to Jackie Singh, a former senior cybersecurity staffer at the Biden campaign who's now an adviser and senior strategist to the blockchain security startup Metaversable. She sees skipping customer identification norms as a red flag for investigators hunting for illicit operators. "There's no reason for a person who is conducting legal business to seek out an exchange of any kind that does not comply with their country's legal KYC processes," she says.



◀ Federation Tower East, also called Vostok, is the second-tallest building in Europe

One reason Vostok has become a locus for this activity is the credibility the address conveys, according to Stanislav Bibik, a partner at Colliers, the property investment firm. Operating there "gives status to the tenant and says that he has a solid business," Bibik says. The reality is that companies operating in the building don't necessarily have any direct connection to its management firm, billionaire Roman Trotsenko's Aeon Corp. Aeon manages the building and acts as its broker while owning a small percentage of its space, and individual floors are now owned by more than 100 other entities. These have recruited their own tenants without any direct involvement from Aeon, according to real estate experts in Moscow. Aeon didn't respond to requests for comment.

The cryptocurrency companies operating within the building are using it as more than a P.O. box—in at least one instance it's the location where money actually changes hands. A digital coin trader recently described the experience of cashing out coins at Vostok through EggChange, requesting anonymity to protect the identities of those involved in an investigation aimed at identifying players central to global cryptocurrency laundering.

The transaction, like most others, began by exchanging messages with an account on the messaging service Telegram, which EggChange advertised on its website and on cryptocurrency web forums. The person running the account provided a document with formal terms of exchange, including the vendor's commission of 1.7%.

FEDERATION TOWER EAST: SEFA KARACAN/ANADOLU AGENCY/GETTY IMAGES. INDIA: SAMYUKTA LAKSHMI/BLOOMBERG. DATA: TRACXN

The document had spaces for the trader to include a name, passport number, and signature, which the trader was instructed to return to EggChange. But the trader never provided the information, and EggChange never demanded it. All the platform wanted was a name–any name–so the front desk at Vostok could print out a visitor's badge. *Bloomberg Businessweek* confirmed the trader's account by reviewing Telegram chats with EggChange.

EggChange allows customers to cash out cryptocurrencies through couriers in multiple countries, but it has presented its office at Vostok as a kind of salon for cryptocurrency enthusiasts. "Besides a safe and quick exchange–we guarantee fun and educational conversations about the world of crypto, coffee, tea and strong beverages," reads a 2018 forum post advertising its services.

The reality was more pedestrian. The trader sent a proxy, also known as a money mule, to pick up the cash. The mule was equipped with a fake passport, but the trader says no one at the security desk or EggChange's office ever asked to see any identification. Instead, the mule gave a fake name to obtain a generic plastic badge and was given instructions to ride an elevator to the 22nd floor to gain access to Suite 9.

Upon arrival, the mule found a metal door and keypad. The Telegram contact had provided the four-digit code 2209. At entry, the mule was met by a nondescript, two-room office with views of the meandering banks of the Moskva River. A receptionist was waiting, equipped with a mobile phone and barricaded behind a desk with a bowl of candies, coffee, and tea. There was no EggChange signage, no fun or educational crypto conversations, and no indication that anyone else worked there.

The mule was asked to recite another passcode that had been shared over Telegram, this one to identify and verify the transaction, then asked to deposit any electronics into a locker to defend against electronic surveillance. The receptionist directed the mule toward another door, which swung open to reveal a man who handed over an envelope of cash.

That was the end of the transaction. The mule walked out of the gleaming tower and back onto Moscow's streets, blending into foot traffic, pocketing the cash without ever having to reveal an identity. It was as if no one had been there at all. *—Kartikay Mehrotra and Olga Kharif, with Alexander Sazonov*

THE BOTTOM LINE Companies are enabling the Russian ransomware industry with brazen openness in a prestigious building in the country's capital city.

India's Fintech Boom

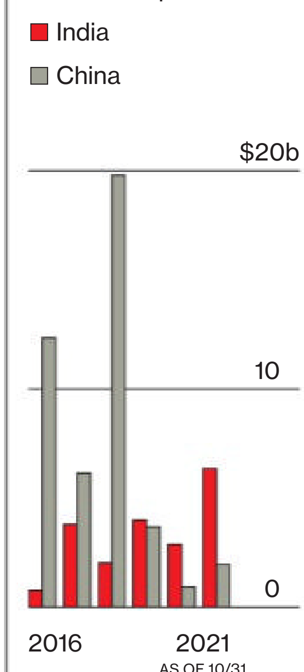
● A government-backed system of digital payments has set off a wave of innovation

Investors in India's booming financial technology sector are poised for a windfall in November when digital-payments company Paytm begins trading publicly. Backed by Warren Buffett's Berkshire Hathaway, China's Alibaba Group, and Masayoshi Son's SoftBank Group, the company has been expanding past its core business of phone-based payments into a broad range of financial services such as banking, credit cards, and wealth management. It's seeking to raise $2.4 billion at a valuation of about $20 billion in a dual listing on India's Bombay and National stock exchanges in what would be India's largest-ever initial public offering.

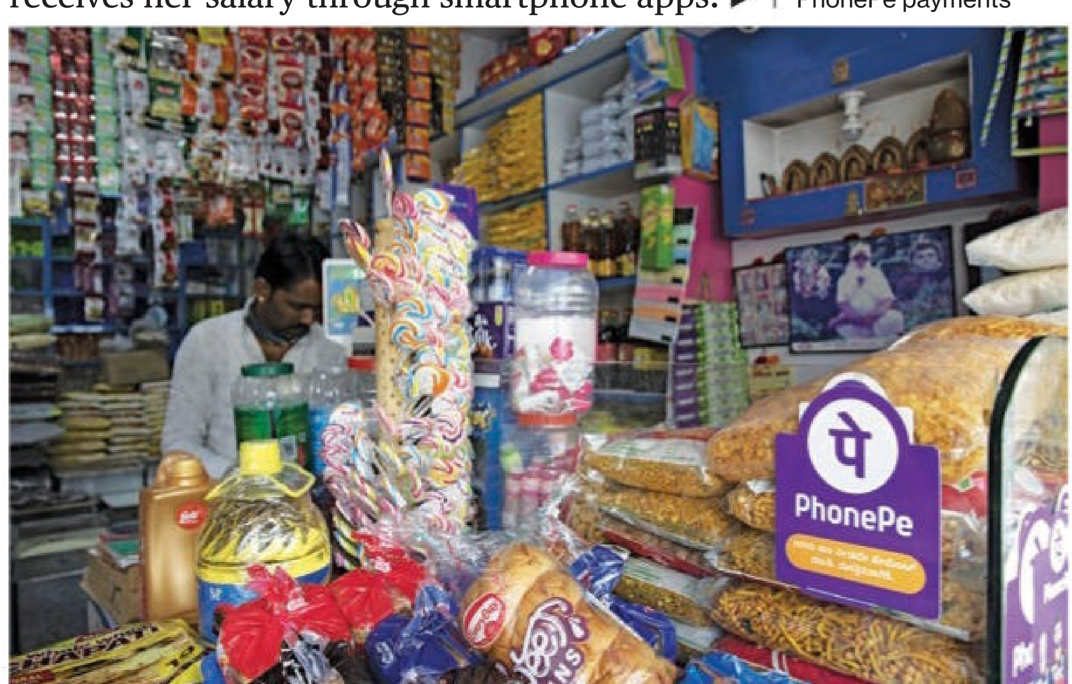
The cash-out could create more optimism about an industry that's already booming. Venture capital and private equity firms have invested $6.4 billion so far this year in Indian fintech companies, according to researcher Tracxn. Investors are attracted by the migration of India's huge population to apps or mobile QR codes for many purchases, a drastic change in an economy that's traditionally been dominated by cash.

Nitu Gore, a 35-year-old maid, is typical of the shift. "I prefer getting my money in Google Pay and Paytm, as I can also buy my groceries, vegetables using the QR codes at shops," says Gore, who receives her salary through smartphone apps. ▶

▼ Value of venture capital and private equity investment in fintech companies



▼ A grocery store, known as a kirana, in Bengaluru accepts PhonePe payments



◀ "No one uses cash anymore."

Another important driver is the Indian central bank's embrace over the past five years of the Unified Payments Interface (UPI), which connects banks and payments systems in a single platform and allows money to flow easily between more than 230 banks over 20 third-party apps. In the past two years, payment volume has risen almost fivefold, to 41 trillion rupees ($550 billion). "It's the equivalent of the creation of the National Highway System in the U.S. and leads us to be very bullish on possible opportunities in India," says Raghav Maliah, vice chairman of global investment banking at Goldman Sachs Group Inc., which is involved in Paytm's IPO.

The UPI has been a vital component of local success stories like Paytm, but it could also help large U.S. companies that are eager to capture a share of India's market. Alphabet Inc.'s Google Pay and Walmart Inc.'s PhonePe handle most of the peer-to-peer and consumer transactions on the UPI platform, largely because they offer their users attractive interfaces and cash-back deals.

Paytm still has the largest share of India's merchant payments market and the advantage of having its own regulated payments bank, which allows it to offer a wider range of services. Its international competitors, meanwhile, are looking to form partnerships with regulated financial entities: Google is collaborating with fintech startup Setu to offer accounts with better interest rates than large banks; Amazon.com Inc. has invested in fintech, insurance, and lending startups. "The success of UPI and digital payments has opened many new opportunities for the financial-services industry to partner deeply with fintech players," Sajith Sivanandan, Asia-Pacific head of payments at Google, wrote in a recent blog post.

Digital lending in India is expected to rise to $350 billion by 2023, accounting for about half of total retail loans, according to Boston Consulting Group. That could be an economic boon to a country where the World Bank estimates that only about 10% of adults have access to formal loans. But the expanding ambitions of the fintech sector are also stirring concerns that companies will steer customers toward products that are riskier than they seem. Authorities are also struggling to combat an increase in online payments fraud. All of this is leading to calls for stricter government oversight.

For investors it may be oversight in another huge market—China—that really matters. International investors have spent the past few years largely on the sidelines in China even as the country has transformed itself into a $46 trillion-a-year global leader in digital payments. Chinese fintech companies now draw only one-third the venture capital that their Indian counterparts do, according to Tracxn. Beijing's tighter regulations on its tech sector could cause investors to pull back further, according to Anuj Kapoor, managing director for investment banking in UBS Group AG's India business.

"Overnight, Chinese regulations on digital companies have dented the confidence of investors primarily in the digital-technology sector," says Kapoor. "More and more investors will look to India." *—Saritha Rai, Suvashree Ghosh, and Baiju Kalesh, with Jun Luo*

THE BOTTOM LINE Investors are targeting India's fintech industry because of a transformation in consumer behavior and a climate for tech companies that's friendlier than the one in China.

The Chip Shortage: It's Complicated

● Newly public GlobalFoundries is bullish about semiconductors, but uncertainty abounds

When Apple Inc. reported its most recent quarterly earnings, it said that revenue was $6 billion less than it could have been because it couldn't get all the chips it needed and that the current quarter would be even worse. In doing so, it was revealing not only that the global semiconductor shortage was affecting one of the world's most valuable companies, but also how it did so.

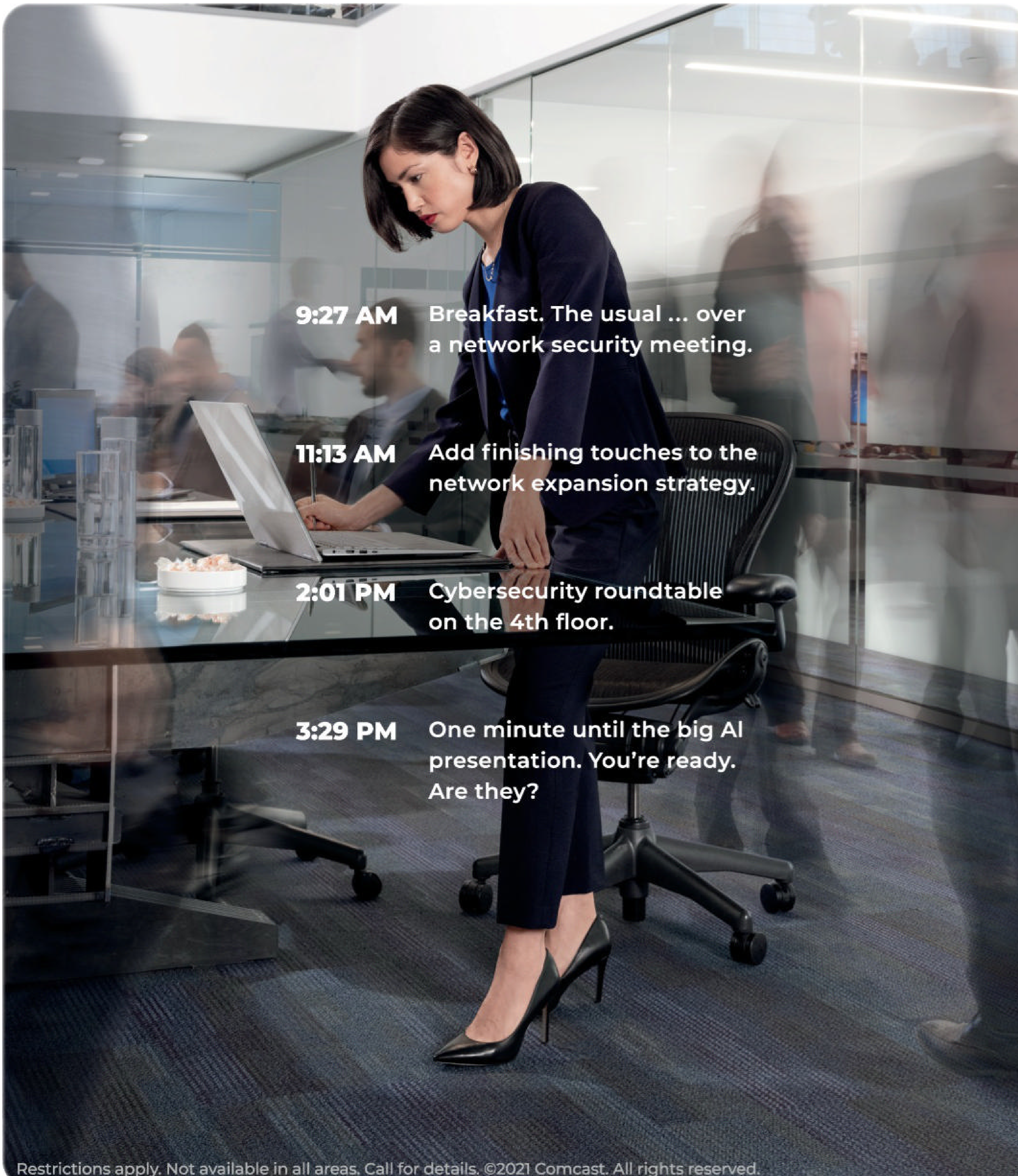
● Tom Caulfield

Apple's devices famously use cutting-edge chips that the company designs for its own needs. Those weren't the problem, according to Chief Executive Officer Tim Cook—it was the simpler chips that carry out mundane functions such as managing power and data. "On legacy nodes, we compete with many different companies for supply, and it's difficult to forecast when those things will balance," he told investors on Oct. 28.

The semiconductor industry is forever focused on making even more impossibly advanced chips, but the global chip shortage is most acute when it comes to chips made through processes that haven't been cutting-edge for years. As a result, chipmakers who can't compete with the most sophisticated players in the industry have been sharing in the boom in orders over the last 18 months.

This is good news for GlobalFoundries, the ▶

COURTESY GLOBALFOUNDRIES


9:27 AM
Breakfast. The usual ... over a network security meeting.
11:13 AM
Add finishing touches to the network expansion strategy.
2:01 PM
Cybersecurity roundtable on the 4th floor.
3:29 PM
One minute until the big AI presentation. You're ready. Are they?
Restrictions apply. Not available in all areas. Call for details. ©2021 Comcast. All rights reserved.

▲ The GlobalFoundries chipmaking plant in upstate New York

◀ New York-based chipmaker owned almost entirely by the investment arm of the government of Abu Dhabi. GlobalFoundries, or GloFo as it's sometimes called, raised $2.6 billion when it went public the day before Cook's comments, quietly completing the third-largest initial public offering on a U.S. exchange this year, according to data compiled by Bloomberg. By Nov. 2 its share price had jumped more than 20%.

The company plans to spend $6 billion bolstering production, a small fraction of the commitments from top high-end chip producers TSMC and Samsung Electronics. GloFo, which was founded in 2009 as a spinoff of Advanced Micro Devices Inc.'s manufacturing operations, spent years bleeding cash in an attempt to achieve the scale required to compete with the top tier of chipmakers. In 2018 it gave up on making the most sophisticated chips and switched its focus to easier-to-manufacture parts.

Semiconductor production is costly and time-consuming to set up, and GlobalFoundries kept losing money for years as it reshaped itself. But after a $301 million loss on revenue of about $3 billion in the first half of this year, it has more than $2 billion of commitments from customers to help it expand production, according to Chief Executive Officer Tom Caulfield. He says the growing need for chips in so many areas will translate into a period of sustained expansion for the industry. "We're sitting at a half-trillion-dollar semiconductor market, and it took us 50 years to get here," Caulfield says. "Consensus is we're doubling in the next 10 years. What's different this time is we're going to have to go 10 times faster."

Still, the chip market lurches in ways that are brutally difficult to time correctly. Periodic supply crunches inspire chipmakers to pour money into increased capacity, only to create a glut when customers pull back, leaving them with no way to recover their investment.

At this confused moment in the global economy, there are signs that Caulfield's optimism may be misplaced. Chipmaker Texas Instruments Inc., a bellwether for the industry because of its tremendous reach, recently revealed a forecast that suggested the surge in electronic components is already beginning to slow.

GlobalFoundries is in an interesting position related to the other shifting dynamic in the semiconductor world: geopolitics. Its main plant is in upstate New York, near Albany, an attribute that Caulfield, a veteran of IBM's chip operation, has tried to play to his advantage as he lobbies for subsidies from the U.S. government.

The Biden administration is worried about the lack of control that the U.S. has over the supply chain. But even after its U.S. IPO, GloFo is controlled by Mubadala Investment Co., which owns 80% of the company and whose main investment goal is to diversify Abu Dhabi's economy away from oil. All this could muddy up the politics for a semiconductor company trying to navigate an industry that's shifting in mysterious ways. Now it has to add to its list of tasks the art of pleasing public market investors. —*Ian King*

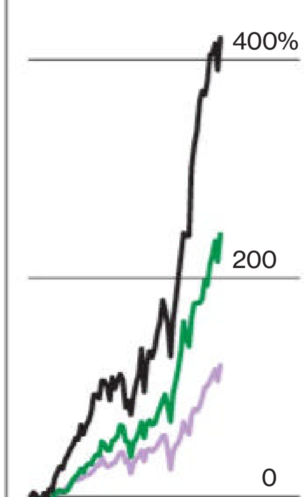
THE BOTTOM LINE Demand for less-sophisticated semiconductors has spiked as the pandemic persists, which is good news for a company no longer chasing the industry leaders.

▼ Change in index value since Oct. 30, 2015

Philadelphia Stock Exchange Semiconductor Index

Nasdaq 100

S&P 500



ADAM GLANZMAN/BLOOMBERG. DATA: COMPILED BY BLOOMBERG


ADVERTISEMENT
How the Covid Battle Ignited Innovation
Adam Schechter
Chairman and CEO
Labcorp
Labcorp's capabilities in both cutting-edge diagnostics and breakthrough drug development have proven crucial in supporting the fight against Covid. "It was an essential partner in supporting pharmaceutical companies to get Covid vaccines and therapeutics to market in record time," says Jaison Ellis, Director of Wells Fargo Corporate & Investment Banking. Their combined expertise means Labcorp, which has the ability to run 500 million diagnostic tests a year, was able to perform more than 50 million Covid tests and work on over 800 Covid studies.
"Wells Fargo has worked with us for more than 25 years," says Labcorp Chairman and CEO Adam Schechter. "They advised us on our largest acquisition to date, which positioned us to help combat the pandemic. And now that we've seen how fast we can innovate through Covid, we're applying those learnings to other areas like oncology and Alzheimer's disease."
bloomberg.com/questforbetter
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Just When You Think YOLO Is Finished…

● The gains on faddish investments may not last, but the urge to speculate isn't sated

Although they may not age as well as a bottle of Bordeaux, you can think of the "meme" investments embraced by individual traders as coming in vintages. Each one gives you a flavor of a moment in 2021's very weird market psychology.

The January vintage is best-known: GameStop, AMC, BlackBerry, and a handful of other hot nostalgia names that denizens of online chat boards were rooting for. The May vintage was all about Dogecoin, a virtual token bearing a shiba inu mascot that reached a record of about 74¢ that month. October 2021 moved on to a special purpose acquisition company tied to former President Donald Trump's social network; November already has Avis Budget Group Inc. as well as Bed Bath & Beyond Inc.

Anyone who thought betting on inside jokes would end with GameStop Corp. missed the point. With the U.S. staggering back to some version of normal in the twilight of the Covid-19 pandemic, trading as a new great American pastime has endured. The fading of any individual meme name hasn't doomed "you only live once"-style investing. At least, not yet. "Novice traders who made a lot of irrational trades are absolutely in love with investing—that love isn't going away anytime soon," says Tim Ghriskey, senior portfolio strategist at investment adviser Ingalls & Snyder. "The YOLO crowd is looking for the 'new' new thing, and what's considered new is constantly evolving."

In mid-October you'd have been forgiven for believing meme investing was beginning to subside. Rank-and-file employees were returning to office towers and had less freedom to spend daytime hours trading. Reopened movie theaters, bars, and ▶

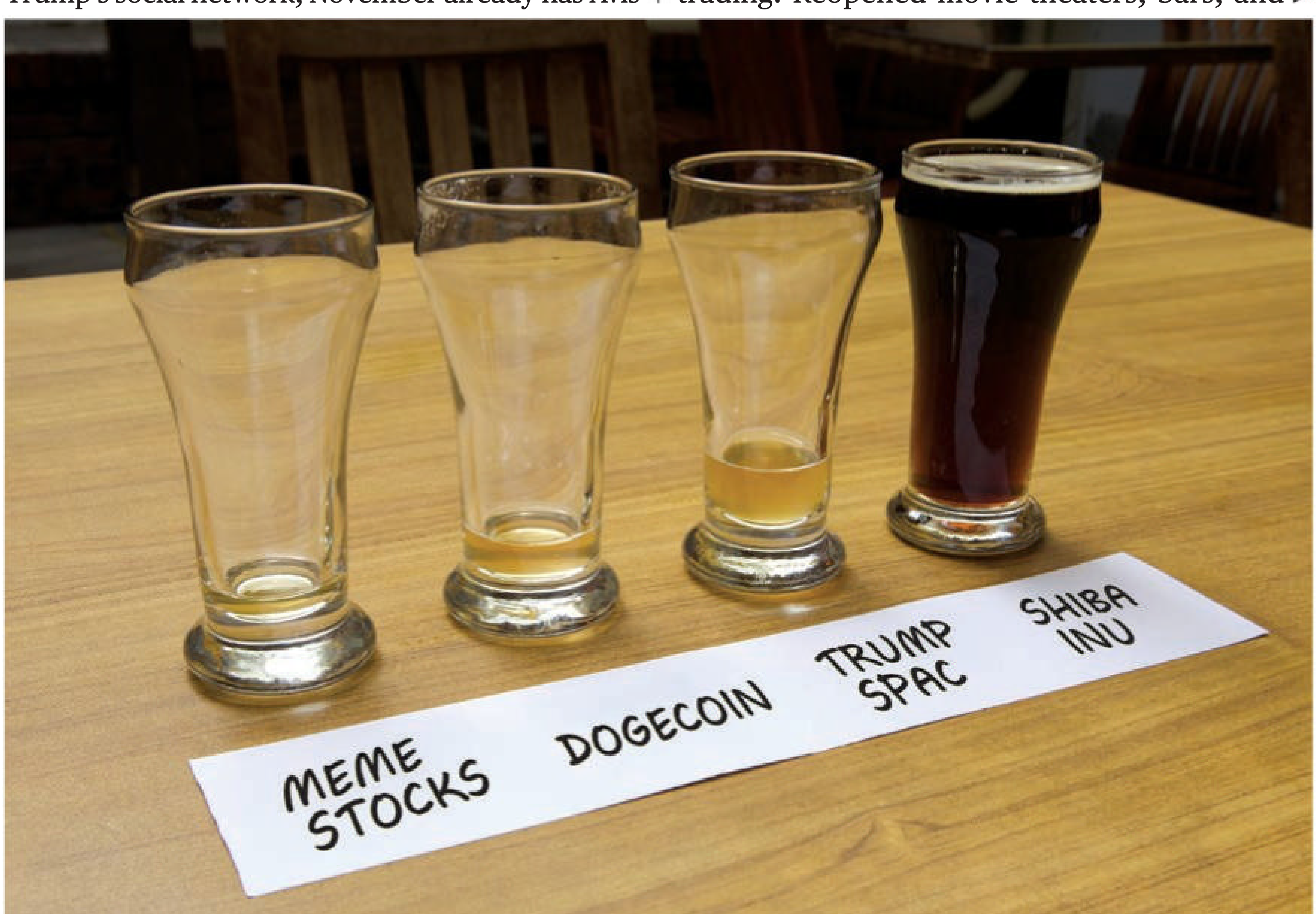


PHOTO ILLUSTRATION BY 731. PHOTOGRAPH BY JOEL BARHAMAND FOR BLOOMBERG BUSINESSWEEK

Edited by Pat Regnier

◀ sporting events gave people other entertainment options. Barstool Sports founder David Portnoy's Twitter feed, once littered with trading videos, went back to football and pizzeria reviews.

AMC Entertainment Holdings Inc., while still way above its price at the start of the year, was down a third from its summer peak; Dogecoin had fallen by two-thirds. Large brokerages catering to individual investors—including Charles Schwab Corp. and Robinhood Markets Inc.—saw trading activity slow down in the three months through September. Trading in call options among small investors also declined. These contracts, which allow traders to use leverage to amplify their potential gains and losses on a stock, were the fuel for a lot of this year's speculation.

The pseudonymous founder of Litquidity Capital, a meme-slinging finance satire account, said he was starting to feel his fun-money portfolio of YOLO stocks becoming a little ho-hum. LitCap YOLO I, which followers can track on social investing app Iris, includes GameStop, Dogecoin, and more than a dozen other names that went viral this year. The fund was up about 5% for the year before markets opened on Oct. 20—paltry in comparison with the S&P 500 index's 20% gain to that point. Reached by phone during a walk in Central Park, the founder, who goes by Lit, said the portfolio had started to lose some of its zeitgeist-y luster.

Less than 24 hours after that conversation, things changed. Trump announced plans to merge his not-yet-running social media platform with the blank-check company Digital World Acquisition Corp., and the shares skyrocketed 357% on Oct. 21. Litquidity took note, snapping up shares for the YOLO account and firing off a message about how much things had changed in the space of a single trading day.

Swift shifts in sentiment can be a challenge for the companies ministering to the whims of retail traders. Robinhood saw trading swell during the rallies of GameStop and Dogecoin, the only novelty token it lists on its trading app. But the Menlo Park, Calif.-based brokerage missed out on a more recent mania for Shiba Inu coin, because it doesn't list it. Shiba Inu coin, minted last year, vaulted over Dogecoin to become the ninth-most-popular digital currency, with a market value higher than Robinhood's own—at least on paper.

Meanwhile, Robinhood reported its crypto trading activity cratered 78%, to $51 million, in the third quarter from the preceding one. The company missed revenue estimates for the period, too. Although it had warned that a slowdown could be on the way, investors sent Robinhood stock down more than 10% after the results were released. Rivals Webull Financial LLC and the cryptocurrency app maker Coinbase Global Inc. both offer Shiba Inu coin. But Robinhood executives struck a more cautious tone, saying they needed to think carefully about what to list, because they didn't want to give users access to any cryptocurrencies that regulators might consider unregistered securities.

"We're going to be very careful," Chief Executive Officer Vlad Tenev told analysts on a call. "We're a regulated entity, and we're hopeful to get some clarity soon on coins." That approach clashed with the demands of at least some of its 22.4 million customers. The top investor question for Robinhood management when the company reported earnings was about when the app would list Shiba Inu coin.

"You don't want to be known as a brokerage firm that burns investors and urges speculators," says Ghriskey, the strategist. "Robinhood is going through a big growth phase, and it's never easy." The company has already been under an intense spotlight about its practices this year. It was the popular trading platform for the first wave of meme investors, and it temporarily restricted the buying of GameStop and other equities when their volatility surged. Robinhood said this was because its clearinghouse, which records and settles its customers' trades, demanded a huge deposit to cover the increased risk of those stocks. In testimony before Congress, Tenev faced questions from lawmakers about the incident, as well as about whether its free app was making risky trading more appealing to young investors.

"Novice traders who made a lot of irrational trades are absolutely in love with investing"

Part of the longevity of YOLO trading points back to shifts in technology and accessibility that Robinhood, Coinbase, and other new platforms have ushered in. Only in the past six years has it become possible to view a message or meme on Reddit and purchase a related stock as lightly as you might impulse-buy a tie-dye sweatsuit on Amazon.com. Not only do investors pay zero trading commissions—they also rarely face a minimum investment and can often buy fractions of a single share or a single cryptocoin. It's easy to take a flyer.

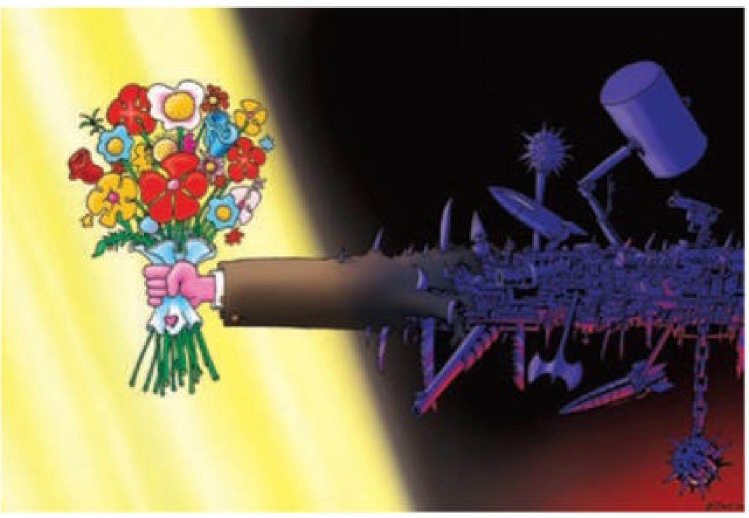
But what happens when the hype fades? Thomas Peterffy, the chairman of Interactive Brokers Group Inc., says he doesn't anticipate one major event killing the meme trade. Instead, excitement around each investment will dwindle slowly, one by one. "Eventually those stocks will go down to the level those businesses deserve," he says. "I don't think there will be a trigger." *—Annie Massa and Elena Popina*

THE BOTTOM LINE As people returned to offices and familiar entertainment options, it seemed that meme trading might fade. But technology may have changed investing for the long term.

ILLUSTRATION BY BAPTISTE VIROT. DATA: PREQUIN. BASED ON DATE OF FIRST INVESTMENT

Buyout Funds Want To Save the Planet

● Private equity is retooling its image by opening more do-good “impact” portfolios



Decades after the leveraged-buyout industry rebranded itself as private equity, private equity is rebranding as the next big thing in green and socially minded money management. While some see this as a way to put a kinder, gentler face on a famously aggressive business, investors have been pouring billions of dollars into funds that aim for a positive impact beyond financial return.

A record 132 “impact” funds have started this year, according to data from Preqin, which tracks the industry. The category has amassed $20 billion since 2015, data compiled by Bloomberg show. Impact funds often target investments in renewable energy, health care, affordable housing, or other socially important industries. More broadly, many clients want firms to consider ESG criteria, the industry shorthand for a company’s environmental, social, and governance practices. “If there isn’t investor demand, they wouldn’t be doing it,” Bob Jacksha, chief investment officer for the New Mexico Educational Retirement Board, says of the industry’s efforts.

Some of the biggest investors in private equity funds are pension plans whose beneficiaries are concerned about climate change and social justice, and the industry is trying to show that it’s listening. In September, Carlyle Group Inc. and Blackstone Inc. joined with clients, including the California Public Employees’ Retirement System, to share and privately aggregate information related to emissions, diversity, and the treatment of employees across companies. The aim is to create standards and metrics that can track progress industrywide. (Bloomberg LP, the parent company of *Bloomberg Businessweek*, is a provider of ESG data to financial professionals.)

Detractors of private equity question whether an industry known for buying companies and then piling on debt, cutting costs, and cashing out in three to five years will leave those businesses better off. “People are doing normal leveraged buyouts, but they take a subset that are feel-good sectors and call that impact,” says Ludovic Phalippou, an economics professor at the University of Oxford’s Saïd Business School. “These investments would have been made anyway.”

Funds are plowing ahead. KKR & Co. is marketing its second impact fund after wrapping up capital-raising for its first one last year at more than $1 billion. Apollo Global Management Inc. was on track as recently as July to lock in more than $500 million for its inaugural impact fund.

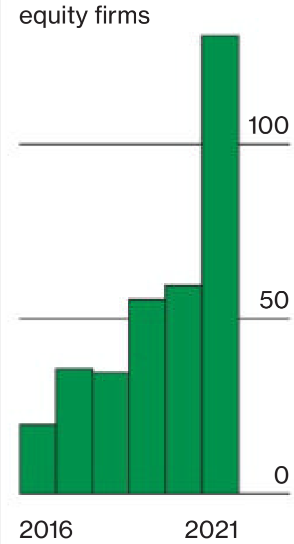
Both firms point to 12 years of responsible investing efforts, including ESG reporting from their portfolio companies. Apollo says it will incentivize executives to hit certain impact targets. It’s promised to link 2% of its cut of the fund’s profit to meeting those goals, but only after returns reach 8%, according to a marketing document. The firm is relying on part of its buyout track record to promote the fund.

One of the companies it highlighted as an example of doing well by doing good is Amsterdam-based Lumileds, which supplies energy-efficient LED lighting. Within a year of being bought in 2017, Lumileds took on debt to pay dividends, including $405 million to Apollo’s eighth flagship buyout fund, handing it 50% more than what it put into the deal, according to a quarterly report sent to clients.

Since then, Lumileds has fired almost 1,000 employees, about 11% of its 2018 workforce, its 2020 sustainability report shows. Moody’s Investors Service, which in May warned of a possible default, blamed the company’s debt-funded dividends in part for its current woes. Lumileds carried a conservative debt load when it declared the dividend and only later faced unforeseen industry challenges that were exacerbated by the pandemic, Apollo spokeswoman Joanna Rose said in an emailed statement. “We are working closely with the management team to preserve the company,” she said.

At KKR money is already rolling in, though the effort is in its infancy. Its first do-good fund sold part of its stake in KnowBe4 Inc. and was on track to reap a fivefold return as of midyear. KnowBe4, which helps companies prevent phishing attacks by hackers, qualified as an impact investment, according to KKR, because its business model fits with sustainable development goals set by the United Nations. ▶

▼ Impact funds started by private equity firms



◀ KKR, mostly through its impact fund, took a dividend of about $16 million from Graduation Alliance, a company that helps high school dropouts graduate, just 16 months after buying the business. The payout wasn't funded with debt, a KKR spokesperson says. The firm is using surveys to measure outcomes for graduates and is running a pilot program to link Graduation Alliance's executive pay to retention and enrollment.

The private equity firm TPG uses an entity it owns, Y Analytics, to sift through academic studies that can help it put a dollar value on impact. Each TPG company has different impact goals. At financial technology company Acorns, TPG tracks impact through increased savings by its customers. At DreamBox Learning, impact is measured through the number of students using the education platform and how often they use it, according to a presentation.

Given the various ways firms measure impact or ESG across their portfolios, investors and activists are pushing for more data. "There is an urgent need for greater transparency to avoid what we have now, where companies write a narrative with cherry-picked anecdotes," says Alyssa Giachino, climate director of the advocacy group Private Equity Stakeholder Project. —*Sabrina Willmer*

THE BOTTOM LINE Large institutional investors such as pension funds are increasingly sensitive to environmental and social matters, forcing private equity to respond.

SoftBank Has a Talent Problem

● The investing conglomerate is a VC powerhouse that doesn't want to pay like one

Ever since billionaire investor Masayoshi Son set up the giant Vision Fund in 2017 to provide backing for technology startups, he's struggled with how to compensate his partners. He still hasn't figured out how to keep them happy.

Son's company, SoftBank Group Corp., is preparing to make the first distribution of profits to employees at the Vision Fund in December, according to people familiar with the matter. But the company's eccentric approach to compensation is contributing to a stream of defections, say these people, who asked not to be identified because the matter is private. Seven managing partners have left since March of last year, and the only senior managing partner, Deep Nishar, will depart by yearend. He didn't respond to a request for comment.

At the heart of the matter is that Son set up the world's biggest venture capital fund within a Japanese conglomerate. While corporate staffers in his home country earn modest salaries by global standards, the finance industry's startup gurus are among the highest-paid in the world. Venture firms often allocate 20% of their profits to partners, which can mean tens of millions of dollars each, but that kind of structure would be controversial at a company like SoftBank.

Son's plan calls for profit distributions based primarily on seniority, and all investors from the vice president level on up are entitled to an allocation,

▲ Son

KIYOSHI OTA/BLOOMBERG

whether their deals include such hits as SoftBank's investments in DoorDash and Korean e-commerce company Coupang or fiascoes like WeWork and Greensill Capital, the people say. The total could reach $100 million to $150 million shared among about 70 people, on top of base salaries and bonuses. That may sound like a lot of money, but it's less than what top venture firms hand out. And Vision, which raised $100 billion to invest in what Son called a once-in-a-lifetime "gold rush" of companies built around the internet and big data, ▶

◀ was meant to be the VC world's power player.

"Considering all the big talk they had and the expectations about what they were trying to achieve, it seems somewhat mediocre, even if this is only the first distribution with more to come," says Ben Narasin, a former venture partner at New Enterprise Associates who recently left to start his own fund. "If you are senior, this will seem light. If you are somewhere in the middle, it's about right. And it's outrageously great if you are junior." According to a person familiar with the pay structure, base salaries for staffers at both junior and senior levels are high. A spokesman for the Vision Fund declined to comment.

Son is revising his compensation strategy yet again for the $40 billion Vision Fund 2, but the new approach has also alienated staff, say the people familiar with the situation. There's no common pool of profits to share this time, and people are rewarded only for the deals they worked on, one says. That will discourage broad collaboration, the person says, and it gives partners an incentive to do as many deals as possible because there's no punishment for misses, while pay is also capped when things go well.

Adding to the frustration is Son's decision to receive a cut of Vision 2's profits for himself as an equity holder before they're distributed to staff and SoftBank. He plans to take a stake of as much as 17.25% in Vision Fund 2. According to Son, he's putting his own money on the line to seed profits for others to share. "I will take risks all by myself initially," he said in August. "Then I will distribute to other people in the management. We want this to remain as the culture of SoftBank."

Among the recent departures are Jeff Housenbold, who counted DoorDash Inc. among his portfolio companies. He declined to comment. "Compensation is the hardest thing that the companies do, and getting it right is truly difficult," says Steven Kaplan, co-founder of the entrepreneurship program at the University of Chicago Booth School of Business. "What happens when you don't pay people enough is that, if you are good, you leave. And if you aren't, you stay."

Raising a smaller fund on your own is more profitable than being a partner at a megafund, according to Narasin. He says a fund with $50 million—the amount he raised for his Tenacity Venture Capital—could generate almost $150 million in profit sharing for partners, given a tenfold return and fewer people to share it with.

The loss of top talent comes at a time when the Vision Fund is sharply accelerating the pace of investments. Son has signed off on more than 115 deals this year, quintupling the number of companies in the Vision 2 portfolio in less than nine months. That's more than the combined number of deals the first Vision Fund has made since it started, according to Bloomberg calculations based on data released by the company. Rivals have also stepped up their pace of investment.

"The premium for talent is much higher now" compared with when the Vision Fund launched, says James Kim, a senior adviser with Coda Advisors LLC, an independent executive and board compensation consulting firm in San Francisco. "Especially this year, there is lots of opportunity. And not just in venture capital, but across any type of fund." Kim notes that the sheer size of the Vision Funds may make it unrealistic for managers to expect a percentage of profits typical at other funds—the numbers are potentially too big.

Among Japanese companies, SoftBank consistently ranks among the most generous in executive compensation. Its top eight executives made more than $64 million in total last fiscal year after the company reported record profits. Simon Segars, who heads SoftBank's chip unit—Arm Ltd.—topped the list with a $17 million paycheck. Rajeev Misra, who heads the Vision Fund, earned $8.4 million, most of which came as base pay. Son's $900,000 put him at the very bottom.

Of course, Son can also make money from his stake in Vision 2 as well as another fund focused on Latin America. That kind of setup has drawn criticism in the past for his mingling personal interests with those of his company. Son, who's also known as Masa, took a 33% personal stake in a unit called SB Northstar, which invested in public stocks and derivatives. "I am surprised this went forward considering the ill will it generates from employees and investors," says Kirk Boodry, an analyst at Redex Research in Tokyo. "The justification is that Masa adds value with his experience, but that is his job already."

When confronted with top-level departures, Son has dismissed the threat of a possible brain drain, saying the company can always raid the major financial firms for more able bodies, according to one of the people. "Son is making the ultimate calls anyway," Narasin says. "The Vision Fund is not winning deals on the quality of its team. For the most part, it wins by paying up big-time. And then who cares if the person giving the offer is a young ex-banker or a seasoned VC?" *—Pavel Alpeyev, Gillian Tan, and Giles Turner*

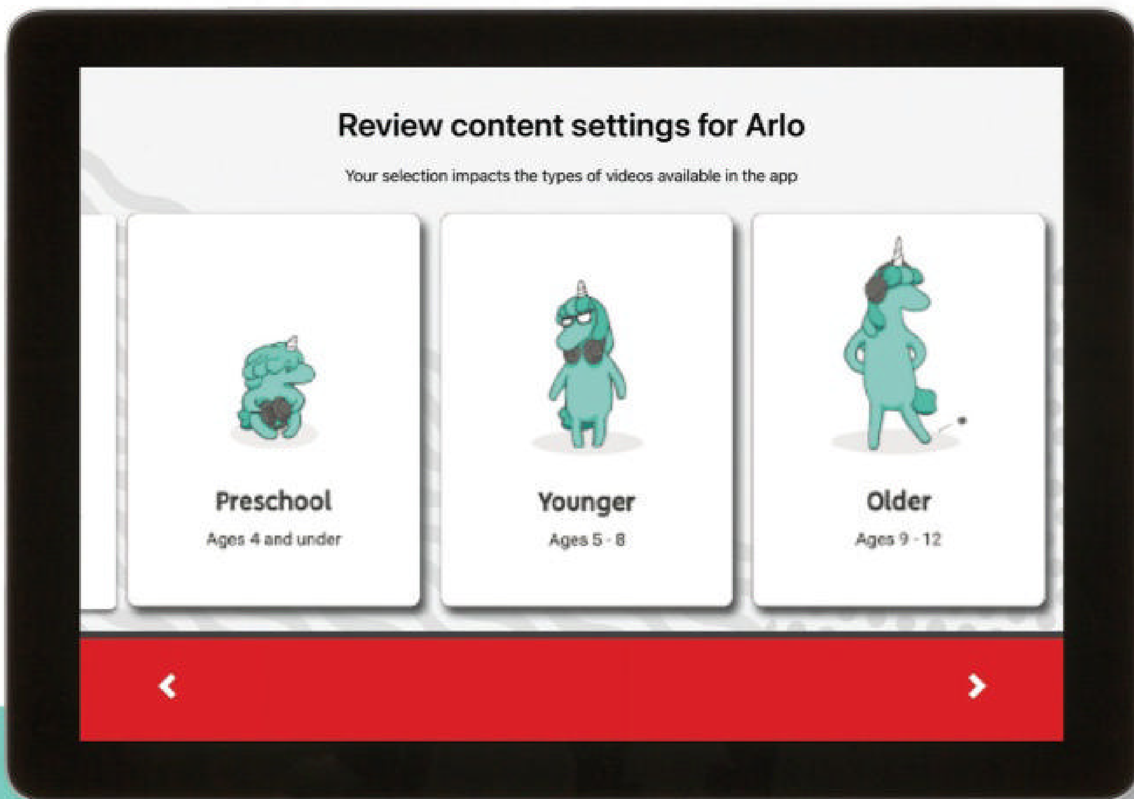
THE BOTTOM LINE Son is planning to increase the pace of dealmaking, but the Vision Funds are facing a lot of competition for top startup experts as well as for investments.

"What happens when you don't pay people enough is that, if you are good, you leave. And if you aren't, you stay"

● Total profit that could be shared among about 70 Vision Fund employees

$150m

You get
to choose content by age levels.



They get
to level up their high jumps.

Filter their content, not their curiosity. YouTube Kids is an app made just for kids, that is loaded with parental controls. So parents can do things like filter the content their kids see based on age, and kids can learn to jump really, really, really high.

YouTube Kids

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Actual product video may vary from images shown.

Good Night, Bond Vigilantes

● The Federal Reserve's boundless appetite for debt has put the market to sleep

At 10:10 a.m. most workdays on Wall Street, officials at the Federal Reserve wade into the Treasury bond market. For the next 20 minutes, they proceed to snap up bonds of all shapes and sizes. They're impervious to price moves, and they never sell. An indiscriminate bond-buying machine, they've now amassed a $5.5 trillion stockpile of the debt.

This is a staggering sum, equal to more than 10 times what the Fed owned before the Great Recession and quadruple the amount held by any other investor. All of this buying comes in the name of injecting money into the economy and driving down interest rates to ward off collapse, first in 2009 and again after the pandemic hit. Which is a reasonable and noble endeavor—central bankers all over the world have pursued similar policies—but in the process, the Fed has come to dominate the bond market to such a degree that no other voice seems to matter nowadays.

At under 1.6%, the yield on the 10-year Treasury bond, a key benchmark for borrowing costs across the globe, is detached from reality. The U.S. economy is growing at a clip of almost 6% this year, inflation is running above 5%, and the Biden administration posted a budget deficit of more than 13% of gross domestic product. The only bigger deficit recorded in the past seven decades was the one the Trump administration delivered last year.

The bond traders of yesteryear would never have accepted such a paltry return in this kind of environment. In the 1980s, as the U.S. was coming out of a prolonged bout of unusually high inflation, they earned the moniker "bond vigilantes" for the way they'd react to any sign of incipient inflation by selling bonds and driving up interest rates. Tom Wolfe ironically dubbed them Masters of the Universe in *The Bonfire of the Vanities*, while Michael Lewis turned them into cult heroes in *Liar's Poker*.

The vigilantes caused a stir in Washington a few years later when they dumped bonds at such a frenetic pace—triggering a huge surge in government borrowing costs—that they bullied the Clinton administration into overhauling its budget plans. The episode so shocked the president's political adviser, James Carville, that he famously quipped at the time that he wanted to be reincarnated as the bond market, because "you can intimidate everybody."

That moment turned out to be the high point of the vigilantes' power. Slowly and steadily, they've lost influence to the point that today they find themselves "outgunned by the bond pacifists" at the Fed, says Jared Gross, head of institutional portfolio strategy at JPMorgan Asset Management.

This creates a risk for the economy. The bond market, for all its imperfections, acted as an important check on government fiscal and monetary excesses. That power now rests almost exclusively with Fed Chair ▶

ILLUSTRATION BY ELISE VAN ITERSON

Edited by Cristina Lindblad and David Rocks

◀ Jay Powell—the man who, along with his fellow board members, tells the Fed's traders how many bonds to purchase each day.

So there's a lot riding on Powell's gamble that the surge in inflation is just a temporary, Covid-induced phenomenon that will soon fade. The danger is that if he's wrong and inflation becomes entrenched in coming months, he'll need to reverse policy so suddenly and aggressively that he could snuff out the economic recovery.

Vineer Bhansali, the founder of LongTail Alpha, an asset management firm in Newport Beach, Calif., says pension fund managers have started asking him for guidance on how to best protect their portfolios against interest-rate volatility. "That tells you they are getting worried," he says. At some point, he adds, "markets are just going to break in some parts. It will be a fun time to trade."

Now is decidedly not.

The bond market on many days is stable to the point of appearing comatose. The ICE BofA Move Index, which measures investors' expectations for bond price swings, hit an all-time low last year; it's picked up some since then, but the moves remain small when observed from almost any historical perspective. The old guard on trading desks chuckles at how the younger generation got riled up when yields crept up 30 basis points, or 0.3 percentage point, in recent weeks. In the 1980s and 1990s, the market moved that much in a day or two.

"It's funny," says John Kerschner, who began working in financial markets in 1990 and today oversees U.S. securitized products at Janus Henderson Investors. "People forget. You had rates going up and down many hundreds of basis points. The Treasury market was a different beast back then."

Or, as Marty Mitchell, a contemporary of Kerschner's, puts it, "the game isn't as sexy as it used to be." Mitchell traded bonds for decades at several different shops and then in 2014 started a popular daily strategy note, the *Mitchell Market Report*. He shut it down last year after the Fed started to dominate the action. "Trading opportunities have diminished quite a lot," says Mitchell. "My expertise was no longer needed." He's out of the bond business entirely now and spends his days working on a book about Jesus Christ.

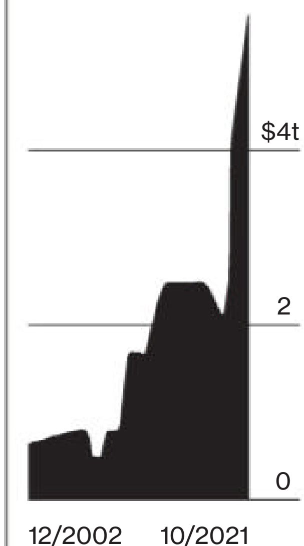
It isn't just the Fed—other forces are working to suck volatility out of the market and hold down yields. The rise of automated trading and passive investing, which strip much of the opportunistic buying and selling out of the marketplace, has played a big role. That benchmark rates are even lower in many other developed countries also means U.S. bonds don't have a lot of competition. Treasuries "are the global safe-haven debt of the world. There is nowhere else to go," says Margaret Kerins, head of fixed income strategy at BMO Capital Markets. "So this is part of it, too."

Still, the Fed is the dominant reason. Even the recent uptick in yields highlights this: It all began as a reaction to Powell stating publicly for the first time that he and the Fed board were getting ready to pare their bond purchases from the current pace of $80 billion a month. (The official beginning of that paring, or tapering in market parlance, could come at a policy meeting on Wednesday.) It was a clear sign that Powell wanted yields to start slowly moving higher.

The vigilantes obliged. For now at least, they do as he wishes. —*Liz Capo McCormick and Ye Xie*

THE BOTTOM LINE With Fed Chair Powell keeping rates down to help the economy, bond traders have little choice but to accept much lower yields than they normally would.

▼ Federal Reserve holdings of Treasury bonds

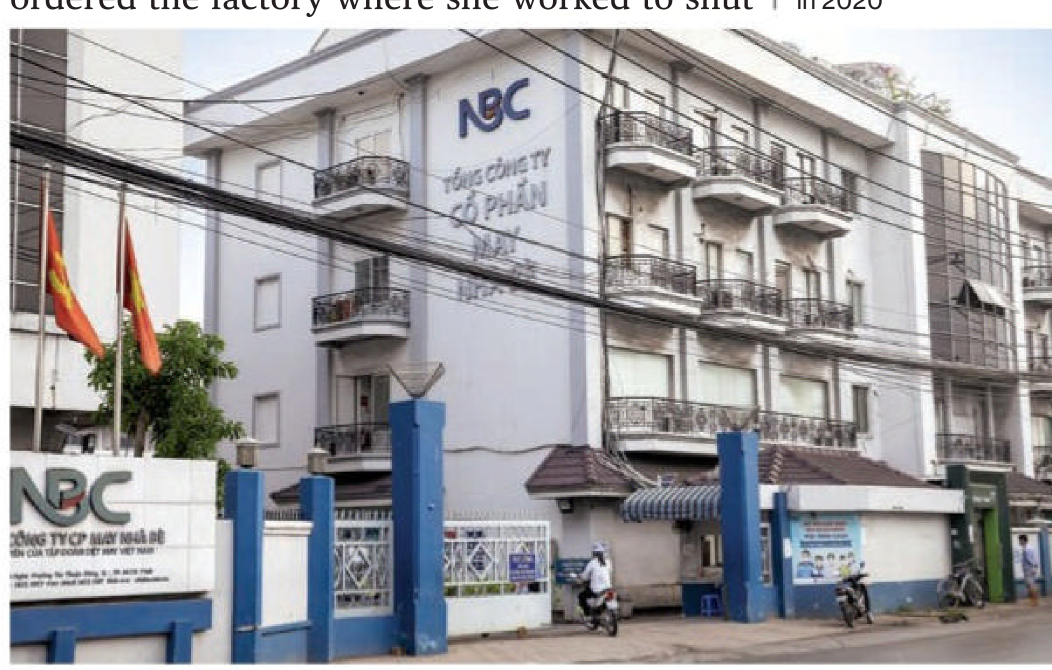


Factory's Open. Where's the Staff?

● Vietnamese manufacturers are struggling to bring employees back to work after Covid-19 shutdowns

For the better part of five years, Le Thi Kim Dung sewed jeans for American brands at a sprawling industrial complex on the outskirts of Ho Chi Minh City. When the delta variant of the coronavirus swept through the area last summer, authorities ordered the factory where she worked to shut

▼ Vietnam's exports reached $283 billion in 2020



MAIKA ELAN/BLOOMBERG (2). DATA: FEDERAL RESERVE (BONDS); ATLAS OF ECONOMIC COMPLEXITY (VIETNAM)

down—while imposing a travel ban that stranded Dung and her husband in a cramped boarding house with a community toilet down the hall. In October, when restrictions eased, the two hopped on a motorbike and drove 100 miles south to their native village in the Mekong Delta—and Dung isn't sure they'll go back. "I'm so scared," says the 34-year-old. "A lot of people got infected and were taken away."

The global economy has a lot riding on the decisions of hundreds of thousands of people like Dung, who fill factories the size of football fields, owned by multinationals and local companies alike. As relations between the U.S. and China have deteriorated, Vietnam has emerged as a manufacturing hot spot, with annual exports climbing almost twentyfold in the past two decades, to $283 billion in 2020. Samsung Electronics Co. manufactures refrigerators and dishwashers there; subcontractors for Urban Outfitters, Calvin Klein, and Gap make T-shirts, jeans, and sweaters; and Nike, Adidas, and Puma get hundreds of millions of pairs of shoes.

These days, many manufacturers are limping along with 70% or less of their workforce as employees resist returning to their sewing machines and metal presses. While that percentage is an improvement from last summer, when thousands of factories like Dung's were shut down entirely, most companies remain months away from reaching full production capacity. "The government thought it could just turn the lights back on in the factories, start the machines up, and the workers would come back," says Carl Thayer, emeritus professor at the University of New South Wales in Australia. "You can't force them."

With Vietnam's recovery at risk, the government and factory owners are doing everything they can to lure people back to their jobs. A Nike Inc. supplier is dangling $100 bonuses, about a quarter of an average worker's monthly paycheck. A maker of New Balance sneakers promises free daily transportation to Ho Chi Minh City from nearby rural provinces. Parliament is planning hearings on the labor shortage, and government officials are setting up Zoom job fairs, sending pleading text messages, and offering rent relief and accelerated access to vaccines for returning assembly line workers. "If the people come back they'll want rent support," says Le Dang Doanh, an economist and former government adviser in Hanoi. "They want to be vaccinated to be as safe from the pandemic as possible."

Vietnam fared well early in the outbreak, with only 35 recorded deaths before April 2021, leaving a sense of relief and pride that the country had dodged the worst of the pandemic. But when the delta variant reached Asia last spring, the country—with just 25% of the population vaccinated even today—was hit hard, especially in the south, where lower-end manufacturing is concentrated. Covid deaths now exceed 22,000 nationwide, with almost 17,000 of those in Ho Chi Minh City.

As things spiraled out of control last summer, authorities imposed draconian measures such as a prohibition on venturing out even to buy groceries. (Soldiers were recruited to make deliveries.) Manufacturers were told they could remain open only if they offered on-site room and board for employees, spurring some to put up tent colonies on factory floors but many more to simply shut down.

With buses back to Ho Chi Minh City scarce and expensive because of travel restrictions, Dung has no plans to leave her village, where barges loaded with bananas, watermelons, papayas, and mangoes float down the river. She's happy to be reunited with her 6-year-old daughter, her husband has found part-time work on nearby construction projects, and her brother has also returned home from his factory job. Besides, she'd spent her savings on rent and food while stuck in the boarding house. "It's better to stay home and earn less than to go back and see people getting ill and dying," she says. "Our parents can help us, we planted our own rice, and we don't have to pay rent." —*John Boudreau, Nguyen Dieu Tu Uyen, and Mai Ngoc Chau*

THE BOTTOM LINE With employees in Vietnam reluctant to return and companies limping along with 70% of their labor force, most manufacturers are months from reaching full production capacity.

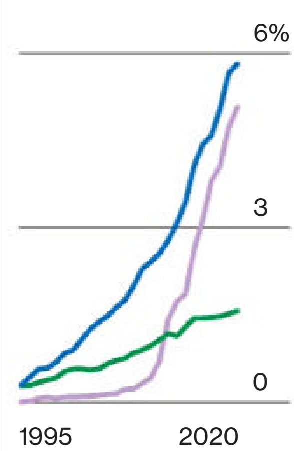
▲ Temperature monitors and sanitizer at a factory entrance on Oct. 7

▼ Vietnam's exports as a share of the global market

Textiles

Electronics

Agriculture



As Good as It Gets

● The Fed risks letting inflation overshoot if it waits for unemployment to fall back to pre-pandemic levels

The Federal Reserve has had a lot of trouble over the years deciding how hot to let the job market run before raising interest rates. In the late 1960s it waited too long, and the result was a wage-price spiral that helped send inflation into double digits during the 1970s. In the mid-2010s it was too quick off the mark, temporarily stifling economic growth and delaying a full-fledged recovery of the labor market until the end of the decade.

Fed Chairman Jerome Powell and his colleagues may soon have to make a call on whether the rebound from the pandemic has brought us to maximum employment. Their task is made more difficult by the mixed signals emanating from the job market, which has 10.4 million unfilled openings but 5 million fewer people on payrolls than before the pandemic.

The current bout of inflation further complicates their discussions. Prices are rising more than two times faster than the central bank's 2% goal. Fed officials are betting that the pace will slow when supply chain snafus are resolved, but the danger is that inflation could become embedded via a feedback loop: A tight labor market compels employers to raise pay, and then companies hike prices to recoup the higher labor costs. Wages rose by 4.2% in the third quarter from a year earlier, the biggest increase since 2001, according to one government gauge. "I do worry that inflation risks have risen significantly," says Brandeis University professor Stephen Cecchetti.

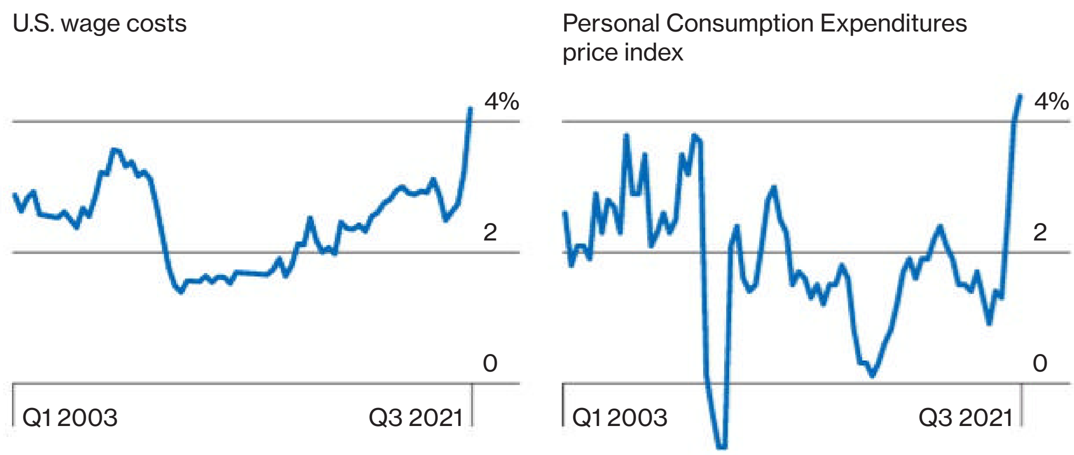
While Powell has acknowledged the labor market is "very tight by many measures," he expects that many of the more than the millions of Americans on the sidelines will trickle back in as Covid-19's latest wave subsides. That influx of workers should take pressure off wages—and inflation—and pave the way for a fall in unemployment back to the half-century lows that prevailed before the pandemic. "In the next two, three, four months we're going to see a lot of jobs growth as delta moves away, because people are going to come back in and take those open positions," says Moody's Analytics chief economist Mark Zandi.

But what if Covid has wrought more permanent changes to the labor market? A recent St. Louis Federal Reserve Bank study found that more than 3 million Americans retired early because of the crisis. Also, some service jobs, such as those at downtown restaurants that used to cater to office workers or at hotels once packed with travelers, may be gone forever. In Las Vegas, "we do know there are about 50,000 jobs that just are not going to come back" in casinos and supporting industries, Elisa Cafferata, director of Nevada's Department of Employment, Training, and Rehabilitation, told National Public Radio on Oct. 24. If the Fed were to keep interest rates low for longer on the expectation that those and other missing jobs might return, it might inadvertently fuel inflation.

"This idea that many people have, that somehow the pre-Covid unemployment rate is a relevant benchmark or that the pre-Covid employment ratio is a relevant benchmark, that's been blown out of the water," says former Treasury Secretary and Bloomberg contributor Lawrence Summers.

Pay Increases Could Fan Inflation

Year-over-year change



DATA: U.S. BUREAU OF LABOR STATISTICS; U.S. BUREAU OF ECONOMIC ANALYSIS, COMPILED BY BLOOMBERG

Tom Gimbel, who has a ground-level view as chief executive officer of staffing agency LaSalle Network, says that in some ways the labor market is tighter than it was in 2019. Setting aside job losses in the face-to-face service industries directly affected by Covid, "unemployment is at historic lows in white- and blue-collar America," he says.

Part of the problem the Fed faces is that economists can't tell what level of employment will trigger inflation in advance. "We don't know what it is until we see it," says Michelle Meyer, head of U.S. economics at Bank of America Corp. "And the way we see it is by observing wage increases" that are persistent and not just one-off hikes. —*Rich Miller*

THE BOTTOM LINE A big challenge for Powell and his colleagues at the Fed is sorting out which changes in the labor market are transitory and which permanent.

Two Afghanistans, One Diplomat's Seat

ILLUSTRATION BY DANIEL ZENDER

● The Taliban want the UN to recognize their ambassador. The old ambassador isn't budging

The Taliban returned to power in Afghanistan almost three months ago, and senior United Nations officials and Western leaders are in regular contact with the Islamic militant group. So are foreign aid organizations, which coordinate with the Taliban on everything from food deliveries to medical assistance as it works to keep Afghanistan from collapsing.

But on the matter of international recognition, world powers aren't quite there yet.

At a meeting this month, a UN committee that includes China, Russia, and the U.S. is widely expected to punt on rival requests for diplomatic representation—one from the UN ambassador of the deposed Afghan government and another from the Taliban. A deferral would allow Ghulam Isaczai, who represents the ousted government of President Ashraf Ghani, to continue to act as Afghanistan's ambassador in New York, even though his government back home is long gone. Meanwhile, Suhail Shaheeen, the Taliban diplomat nominated for the position in September, will likely have to wait his turn indefinitely.

Getting him accredited isn't the Taliban's most pressing matter right now. About 19 million people, or half of Afghanistan's population, face acute food insecurity, according to the UN. Rampant unemployment and a shortage of cash are putting urban residents—including the middle class—in danger of slipping into hardship as winter arrives.

Yet the economic crisis and international recognition are linked: The lack of recognition makes it harder for the Taliban to receive much-needed aid. The Taliban are facing a cash crunch after the U.S. and its partners froze Afghanistan's access to more than $9 billion in overseas assets, mostly central bank reserves held in American banks. The Biden administration has rejected appeals from Russia and China to release the assets as the situation worsens. On Nov. 3, the Taliban banned foreign currencies in a bid to ease the crisis. Funding from the World Bank and the ▶

Edited by Amanda Kolson Hurley

◀ International Monetary Fund is also on hold.

UN officials insist the flow of aid shouldn't be impeded. UN Secretary-General António Guterres has repeatedly called on countries to unfreeze Afghanistan's assets and allow development aid to reach the economy or risk watching it crumble. He's sought waivers to let in money from the IMF.

"We need to separate the political discussion from the humanitarian imperative," says Mary-Ellen McGroarty, the UN World Food Programme representative in Afghanistan. "The international community needs to extend a hand. There is a tsunami of destitution, incredible suffering, and hunger spiraling out of control across Afghanistan."

Many countries still question whether the Taliban, infamous for their brutal rule during the 1990s, merit international support. For now the U.S. and its allies are trying to use recognition as a carrot of sorts, dangling it as a reward if the Taliban reform their approach to human rights and freedom of movement. They also want to make sure the Taliban are serious about suppressing terrorism.

In a rare instance of unity, China, Europe, Russia, and the U.S. are roughly on the same page on the question of recognition, even though they differ on their priorities in Afghanistan. China and Russia are more intent on stopping the drug trade and combating terrorism, whereas Sweden and the U.S. place more emphasis on human rights. "Nobody is in a hurry to recognize [the Taliban]," Russia's UN Ambassador Vassily Nebenzia said on Oct. 29. "The question of recognition will arise when the international community makes sure that the promises and commitments that the [Taliban] authorities announced will be delivered."

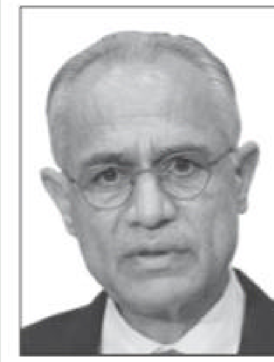
After retaking power in August, the Taliban pledged to respect the rights of women and minority communities and to give amnesty to those who worked with the U.S.-backed government, but crackdowns on these groups have been reported.

Asked how China plans to vote, Zhang Jun, the country's ambassador to the UN, says all members are looking at the issue in a "prudent manner" and China will act on the "basis of international law." Sweden, which chairs the nine-member credentials committee, has declined to comment on the matter.

"It doesn't feel there is a strong bloc of countries ready to make this leap," says Richard Gowan, who oversees UN work at the International Crisis Group, a nongovernmental organization. "They are looking for a way to kick this down the road for now."

It's an unusual, but not unprecedented, situation to have rival claims to a UN seat. In a rare coincidence, the committee will consider competing claims for Myanmar's seat as well in its meeting this month. Myanmar's junta, which took control in February, has put forth its candidate even as Ambassador Kyaw Moe Tun, the representative in New York nominated by the ousted government of Aung San Suu Kyi, has asked to renew his UN accreditation.

Kyaw Moe Tun has the backing of Myanmar's National Unity Government, a shadow government that Suu Kyi's allies set up, but Isaczai represents a government with no real aspiration of coming back. Yet a precedent for keeping Isaczai in his chair exists: When the Taliban ruled Afghanistan from 1996 to 2001, the ambassador of the ousted government at that time remained in place as the UN credentials committee deferred its decision.



● Isaczai

There's also the option to keep the seat empty. In 1997 the committee deferred a decision on rival claims to represent Cambodia and left its UN seat vacant instead. A coalition formed in Cambodia the following year, and its candidate was approved to take the seat, which resolved the issue. —*David Wainer*

THE BOTTOM LINE The credentials contest at the UN underscores a larger dilemma for the world: how to engage with the Taliban, but not condone it, as the Afghan economy collapses.

GOP Surge Spells Trouble for Biden

● Strong Republican showings in Virginia and New Jersey suggest Democrats will struggle in next year's midterms

Republican Glenn Youngkin's victory in Virginia's closely watched governor's race and the tighter-than-expected contest in New Jersey between Democratic Governor Phil Murphy and his Republican challenger are bad omens for Democrats hoping to keep control of Congress in next year's midterm elections.

Youngkin's victory over Terry McAuliffe, a former Virginia governor and Democratic National Committee chair, makes him the first Republican candidate since 2009 to win a governor's race in the state, where Joe Biden beat former President Donald Trump by 10 points only a year ago. It offers Republicans a road map for how to prevail in the midterms. Although McAuliffe worked hard to portray Youngkin as a Trump acolyte, the Republican nimbly threaded the needle by embracing Trump in the primary, then holding him at arm's length to court independents and suburban voters in the general election.

The New Jersey race didn't receive as much attention, in part because Murphy was expected to win easily and because it was fought on more local issues, such as property taxes. But it, too, contained worrying signs for Democrats, as Republican Jack Ciattarelli was able to run neck and neck with a governor whose approval ratings had been solid. The race hadn't been called as *Bloomberg Businessweek* went to press.

A political newcomer and former co-chief executive officer of Carlyle Group Inc., Youngkin used Trump's playbook of focusing on culture-war issues and sought to harness the energy of Trump supporters by raising concerns over "election integrity." He waited until he secured the nomination to agree that Biden had won the 2020 election, and Youngkin's campaign sold red baseball caps that mimicked Trump's signature ones.

But in bluer suburban areas, the candidate distanced himself from the former president. This fall, Youngkin didn't campaign with Trump, who nevertheless endorsed him and held a tele-rally on his behalf without him on election eve.

"Trump was on the ballot for the people he attracts but not on the ballot for the people he repels," says strategist Sarah Longwell, who previously led an anti-Trump Republican group.

Black turnout in Virginia slipped compared with 2020, a sign of some disenchantment that Biden has put his economic agenda ahead of police reform, voting rights, and other issues. White voters accounted for 74% of Virginia voters on Nov. 2 compared with 67% in 2020, CNN exit polls showed. Youngkin also won back some voters who have children, the exit polls indicate.

McAuliffe carried the populous and liberal Washington suburbs, but that wasn't enough to compete with Youngkin's gains in the rest of the state, especially rural areas. Representative Gerry Connolly, a Virginia Democrat, faults his party for not boasting enough about the $1.9 trillion Covid-19 relief bill that "made a huge difference" and instead allowing the focus to be on its inability to pass Biden's economic agenda. "Democrats failed at messaging," Connolly says.

Virginia's gubernatorial election is often watched as a test of approval of a new president, because it's one of the few significant offices up for grabs a year later. It's also seen as an early barometer for how the parties will fare in the following year's midterms. But Virginia historically tends to punish the party in the White House. In the last 12 Virginia gubernatorial elections, ▶

▼ Youngkin at a rally in Richmond, Va., on Nov. 1

ISACZAI: LUIZ RAMPELOTTO/EUROPA NEWS WIRE/AP PHOTO. YOUNGKIN: MARK PETERSON/REDUX

◀ the president's party has won only once—when McAuliffe prevailed over Ken Cuccinelli in 2013.

McAuliffe, Biden, and top-name surrogates such as former President Barack Obama campaigned against Youngkin only obliquely. They instead focused on tying Youngkin to fears of Trump's return, a tactic that the mild-mannered, fleece-vested Youngkin was able to withstand.

Earlier in the campaign, polls showed the coronavirus was a top concern and an issue on which more voters trusted McAuliffe's stricter approach to mask and vaccine mandates. But as pandemic fears began to fade, education came to the fore, fueling a surge in the polls in October for Youngkin, who stoked fears of students learning critical race theory—which is not taught in Virginia schools—and tapping into parents' frustrations at school closures that many said lasted too long during the pandemic.

McAuliffe countered by saying in a September debate that parents shouldn't "be telling schools what they should teach," a statement that backfired and overshadowed his attempts to portray Youngkin as a race-baiter.

Republicans already had advantages heading into 2022. Democrats have only a five-seat margin in the House and need Vice President Kamala Harris's vote to control a 50-50 Senate. The president's party historically loses seats in the midterms, and Republicans control redistricting in many states after the 2020 census.

Biden won independents by 19 points in Virginia in 2020, but McAuliffe lost them to Youngkin by 9 points, according to exit polls. Since June the president's approval rating in Gallup polling has fallen 14 points, to 42% this month, hurt by inflation concerns, the tumultuous U.S. withdrawal from Afghanistan, and the failure to deliver promised infrastructure and social safety-net legislation.

Republican strategist Scott Reed, the former chief political strategist for the U.S. Chamber of Commerce, says Youngkin "managed Trump perfectly" and ran a disciplined campaign, while McAuliffe didn't talk about the future and was dragged down by Biden.

Delaware Senator Chris Coons, a Democrat, told MSNBC on Nov. 3 that Democrats need to move forward with Biden's agenda if they want to win in 2022. "The only path forward is to deliver these two bills to President Biden's desk," he said, referring to the massive infrastructure and social spending measures. —*Mark Niquette and Ryan Teague Beckwith*

THE BOTTOM LINE Democratic setbacks at the polls on Nov. 2 point to a tough environment for the party in next year's midterms, while Glenn Youngkin's win offers a road map for the GOP.

Billionaires Get Off *Easy* In Biden's Tax Plan

● A millionaire surtax would hit high earners hardest while doing little to dent the fortunes of the ultrawealthy

If you're wondering how President Joe Biden's tax framework, unveiled on Oct. 28, would affect rich Americans, here's a rough scorecard. Winning: the vast majority of the top 1%, who might even get a tax cut. Losing: the rich-but-not-fabulously rich, still working to build their fortunes.

To pay for his $1.75 trillion social spending bill, Biden had planned to raise tax rates on pretty much the entire 1%, the 1.6 million taxpayers earning at least $500,000 annually. But after pushback from moderate Democrats, he settled for a far thinner slice of the upper crust, the roughly 22,000 Americans earning $10 million or more. Proposals by Biden and other Democrats to narrow America's widening wealth gap by plugging loopholes and finding new ways to tax large fortunes were eliminated. Progressives, though, are pushing to slip some back into the bill before it becomes law.

"Taxpayers will still be able to defer gains and not face tax on them"

Billionaires are breathing a sigh of relief. A billionaires' tax, which would have forced the superwealthy to report more income to the Internal Revenue Service by recognizing gains on publicly traded assets, was proposed by Senator Ron Wyden, an Oregon Democrat, but dropped.

Taxing the super rich is difficult for the simple reason that huge fortunes don't necessarily mean huge incomes. Investment gains are taxed only when they're realized, and the very wealthy rarely need to sell. So even though the millionaire surtax would hike rates on high earners—bringing the top marginal rate including Medicare taxes to almost 49%—it's unlikely to have a significant impact on inequality at the very top.

"This proposal is not going to impact those taxpayers the way that proponents wanted," Kyle Pomerleau, a senior fellow at the right-leaning American Enterprise Institute, says of ultrahigh-net-worth households. "Taxpayers will still be able to defer gains and not face tax on them."

Those most adversely affected by the new framework are Americans who make lots of money in ways that give them few legal options for sheltering their income. Those with huge salaries—athletes and entertainers at the peak of their careers, for ▶

◀ example—would pay marginal rates of almost 50% on their salaries, plus state taxes that could bring their top rate above 60%. Owners of businesses raking in tens or hundreds of millions of dollars could also be slammed.

Investors with windfalls of more than $25 million would also owe the 8 percentage point surtax, though their top rate would reach only 31.8% because capital gains and dividends are taxed at lower rates than ordinary income. In this group, wealth advisers say, the most noticeable effect would be on families selling private businesses, where one transaction causes income to spike over the surtax threshold after years of more moderate tax bills.

Wealth advisers are already considering ways to make sure their clients don't pay the new surtax, and an obvious strategy is ensuring their taxable incomes stay below $10 million. People selling businesses are likely to spread sales over several years, says Jere Doyle, estate-planning strategist at BNY Mellon Wealth Management.

The tax burden on wide swaths of the top 1% would drop if the bill includes a repeal of the $10,000 cap on the state and local tax (SALT) deduction, says Marc Goldwein, senior vice president at the Committee for a Responsible Federal Budget. Democrats are considering making the SALT deduction unlimited, at least for a few years, before reinstating a higher cap.

The framework still contains provisions that could squeeze some members of the top 0.1%. To make sure taxpayers don't avoid the surtax by shifting assets into trusts, the bill sets a far lower threshold for such vehicles. It also gives the IRS an additional $80 billion to pay for efforts to make sure high-income taxpayers aren't cheating on their returns. And though the top corporate tax rate isn't rising, the bill would tighten rules so U.S. corporations, especially tech companies, pay more in taxes.

"It's not everything we want, but I'm not disappointed," says Senate Banking Committee Chair Sherrod Brown, an Ohio Democrat. "We're making the tax system much fairer than it was."

Progressive activists vow to continue pushing for new ways to tax billionaires. "This is going to be a key test for candidates" in next year's midterm elections, says Frank Clemente, executive director for Americans for Tax Fairness. "We're going to run on this, that billionaires need to be paying their fair share and they need to be paying taxes on the increase in their assets." —*Ben Steverman and Laura Davison*

THE BOTTOM LINE Biden's plan puts the squeeze on high earners such as athletes. Billionaires' fortunes are spared, and many in the 1% could see taxes drop, thanks to the SALT deduction.

Courts Forum Shopping

When mounting a challenge to a U.S. president's policies, lawyers across the political spectrum know that choosing the right courthouse—and trying a case before the right judge—can make all the difference. It's known as forum shopping. So when Texas Governor Greg Abbott and Attorney General Ken Paxton have a beef with Joe Biden, they search out jurisdictions friendly to their politics. That—and the high number of judges Donald Trump appointed—helped get appointees of the former president assigned to nine lawsuits Texas and other red states have filed against the Biden administration. With each suit, Biden's adversaries have three chances to win a favorable ruling and good odds of getting one. Here's an example of how it works. —*Peter Blumberg, with Laurel Brubaker Calkins*

Appointed by Trump

Appointed by another Republican president

Appointed by Obama

Appointed by another Democratic president

District Court

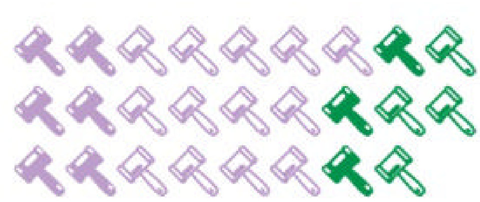
Amarillo, Texas

In April, when Texas sued to stop Biden from ending Trump's so-called remain-in-Mexico immigration policy, or MPP, the state dispatched its lawyers to this Panhandle city. Ordinarily, when a suit is filed at a federal courthouse, it's assigned to a judge through a random lottery. But the only full-time federal judge in Amarillo is Matthew Kacsmaryk, a Trump appointee who took office in June 2019.

In August, Kacsmaryk ordered Biden to reinstate MPP in a scathing 53-page ruling.

Fifth Circuit Court of Appeals

New Orleans



The next round of battle over MPP was at the Fifth Circuit Court of Appeals, where 19 out of 26 judges—as lawyers for Texas know—are Republican appointees. Three appellate judges, including two Trump appointees, upheld Kacsmaryk's ruling.

Supreme Court

After that, the Biden administration asked the U.S. Supreme Court for a reprieve. The high court, which has a 6-3 conservative majority, rejected the request.

The administration is now trying again to terminate and replace MPP, but a hearing at the Fifth Circuit on Nov. 2 didn't go well for Biden administration lawyers.

Paul Nolette, a political science professor at Marquette University in Milwaukee, says that selecting favorable courts and channeling cases to specific judges helped attorneys general score a win rate of about 60% in 78 multistate challenges to Barack Obama's policies over his two terms as president and a victory rate as high as 78% in the 150 cases brought against the Trump administration in only four years. "A big part of it is they get to choose where to start," Nolette says.

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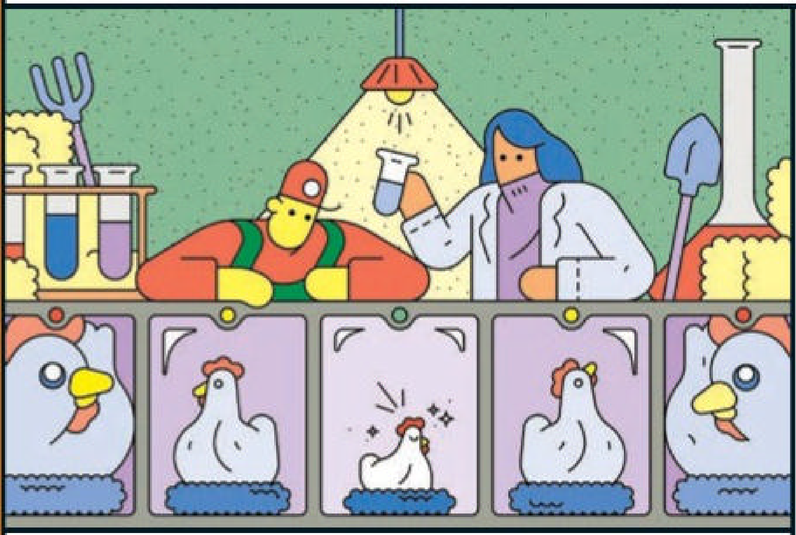
Innovation

Making Chicken Little



After decades of seeking bigger, faster-growing birds, some producers say it's time to slow down

In the 1920s it took more than three months and almost 12 pounds of feed for a chicken to grow to a sellable size, at the time about 2½ pounds. Today, with genetic modifications and industrial farming methods, breeders can get a 6½-pound bird ready for slaughter in seven weeks, while it consumes a bit less feed. But that increase in efficiency has come at a cost: Most chickens are raised in cramped industrial facilities, they've been bred to have breasts so big that they can barely stand up straight, and the meat can be riddled with unappetizing white strips of fat or develop a hard, woody texture.

Now an emerging segment of the industry wants to reverse course, raising smaller birds more slowly—with both ethics and eating in mind. These producers say they can strike a better balance of animal welfare, efficiency, and the meat's flavor and tenderness. They eschew the fast-growing genetic trait, selecting animals whose offspring are healthy, with robust immune systems and strong legs for jumping and running outside. And they're looking to ensure the animals achieve happiness in bird terms, meaning the ability to do things like perch, peck, and scratch in the dirt. "Hyperdemand and competitiveness for cheaper meat have driven down the quality of chicken," says Matt Wadiak, founder of Cooks Venture, a company in Arkansas that sells a slower-growing breed of pasture-raised poultry. "The industry is on a runaway train."

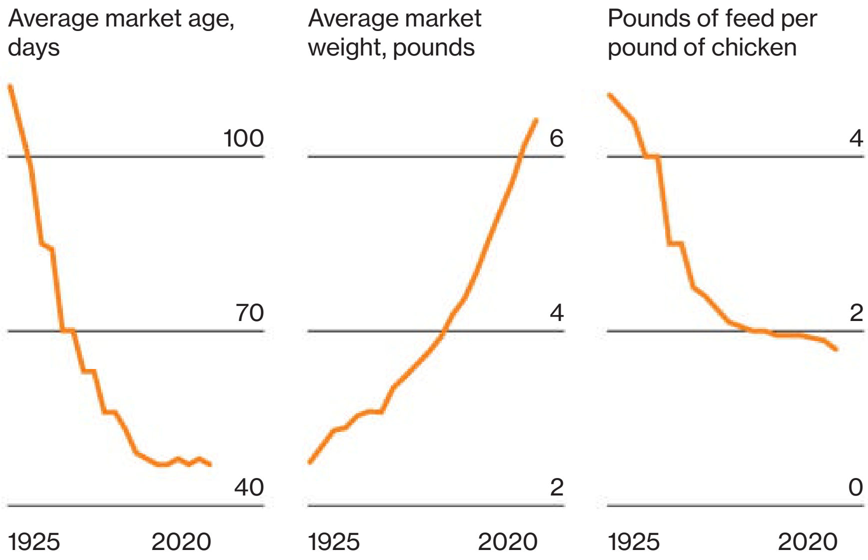
These niche producers will struggle to make a meaningful dent in the market. Currently only two breeders—Aviagen Group and Cobb-Vantress, a unit of U.S. giant Tyson Foods Inc.—control the genetics for more than 90% of the 60 billion broilers annually slaughtered for food worldwide. There's a "massive bottleneck" in chicken genetics, says Jack Algiere, farm director at the Stone Barns Center for Food & Agriculture, a research center in New York's Hudson Valley. Breeders developing new lines have to be cautious because "chances are those genetics are patented or have some intellectual property on them," he says. "It's all been consolidated." Aviagen and Cobb-Vantress say they help chicken producers worldwide supply sustainable and affordable protein using methods that ensure the welfare of the birds.

Despite the animal welfare and quality issues with mass-produced chicken, ▶

ILLUSTRATION BY AARON FERNANDEZ

Edited by David Rocks and Rebecca Penty

The Evolution of the American Chicken



DATA: NATIONAL CHICKEN COUNCIL; U.S. DEPARTMENT OF AGRICULTURE

◀ the inexpensive cuts are responsible for a poultry renaissance. In the U.S. it's the most popular meat—ahead of beef and pork—with Americans consuming an average of almost 100 pounds annually, more than triple the level in 1960. In the past year supermarkets and restaurant chains such as KFC, Wingstop, and Bojangles have reported they can't get sufficient supplies.

Although the smaller producers are more expensive—as much as $10 per pound for boneless breasts vs. about $3.50 for mass-market birds—they say demand for their meat is increasing. Since its inception in 2019, Cooks Venture has grown its weekly output to as many as 600,000 chickens from its breed, a cross between a Transylvanian naked neck and Delaware and Peterson lines. Freedom Ranger Hatchery Inc. in Reinholds, Pa., which sells to small farms, has increased production of its heritage breeds by 20% over the past year. D'Artagnan Inc., a company in New Jersey that focuses on Brune Landaise chickens native to France, has seen sales of those birds jump 28%, to 60,000 a week, since the start of the pandemic. "If you pay more for a good chicken, you're going to get a much, much better taste," says owner Ariane Daguin.

Breeding, though, is painstaking and expensive. Perdue Farms Inc., a giant that controls 7% of the U.S. market for chicken meat, has been working on a series of alternative breeds since 2016 but won't say when any of them will be available in stores. Scott Sechler, owner of Bell & Evans, a premium producer in Fredericksburg, Pa., says it's difficult to design a tasty animal that can also live a longer life. The company has invested $75 million in a new slower-growing chicken but hasn't yet developed a bird with meat that's sufficiently tender. "Any older animal has more flavor but gets tougher," he says. "Consumers don't like that."

Yet advocates of a slower approach say tastes are changing, and the Global Animal Partnership, a food-labeling nonprofit that assesses farming methods, is changing along with them. The group, which certifies animal welfare practices that help determine the purchasing of brands such as Applegate Farms, Coleman Natural Foods, and Whole Foods Market's 365, is set to release a revised list of approved breeds that will initially exclude some of the bigger varieties while adding a few new ones. "It might be a little bit smaller piece of chicken on your plate for the same price," says Anne Malleau, the group's executive director. "But it's better for the bird, and we're hoping consumers will see the value in that." —*Leslie Patton, Michael Hirtzer, and Amelia Pollard*

THE BOTTOM LINE Only two companies control the genetics for more than 90% of the 60 billion broilers slaughtered for food every year, but some producers say they can develop birds that lead a happier life and taste better.

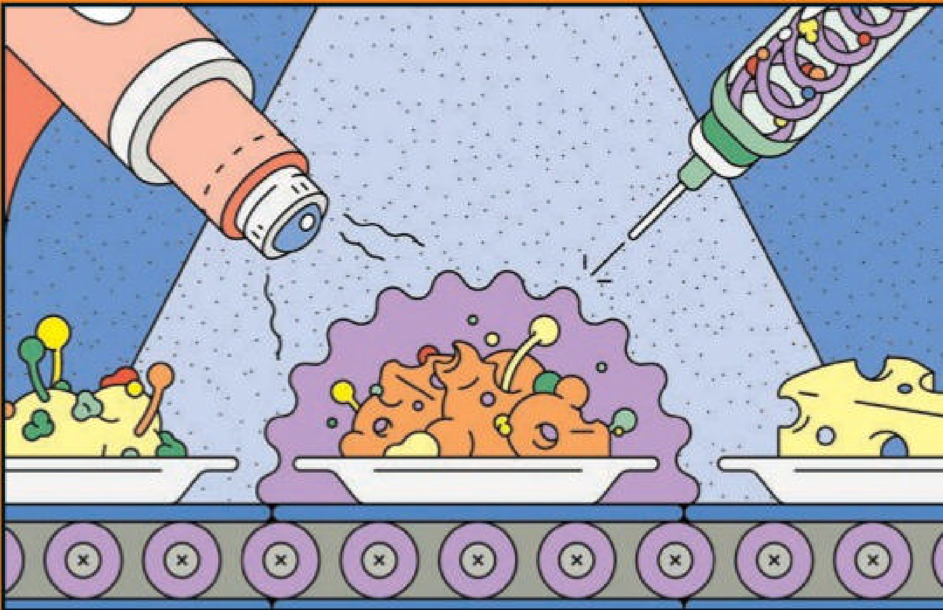
Cheese Without Cows

An emerging technology promises vegan alternatives that are as gooey and pungent as the original

A decade ago, Jaap Korteweg founded a company called the Vegetarian Butcher, which made faux meat close enough to the real thing to be featured on Burger King's menu. But for anyone wanting a cheeseburger, Korteweg couldn't find an acceptable substitute for the other half of the recipe. So last year the Dutch entrepreneur plowed the proceeds from selling the company to Unilever Plc into another venture, Those Vegan Cowboys, aiming to concoct dairy products sans cows. On the way to a plant-based diet, "cheese was the last thing that disappeared from my plate," Korteweg says. "There are no good vegan cheeses."

Most of today's cheese substitutes are based on soy, cashew, or other foods, and they generally lack the real thing's rich aromatics, luxurious texture, and gooey quality when melted. Nut- and grain-based milk substitutes are getting better every year, but they don't have caseins,

ILLUSTRATION BY AARON FERNANDEZ



which account for 80% of the proteins in dairy milk and give cheese its texture. Those Vegan Cowboys is one of dozens of startups seeking to create caseins with precision fermentation, a technology long used to make synthetic insulin. That, these companies say, will soon enable them to produce cheeses that are virtually indistinguishable from the real thing, without the environmental and animal welfare problems.

The process combines fermentation—which humans have been doing for thousands of years to make everything from beer and wine to kimchi and sauerkraut—with gene-splicing techniques developed in recent decades. Technicians modify fungus or yeast by inserting a digital copy of cow DNA. This substance is put into steel tanks, where it reacts with organic materials to produce caseins, which are mixed with fats to produce a milk-like liquid that's the starting material for cheese. "The cow is the processor between grass and cheese," Korteweg says. "So the fungi are the cow in our line."

Investors are betting alternative cheese will be the next big thing as growth in demand for milk substitutes starts to slow. Blue Horizon, a venture capital company in Zurich focused on making food more sustainable, predicts vegan cheese consumption will increase more than fivefold by 2025. About $1.4 billion has been invested globally in dairy substitute startups this year, up 70% from 2020, according to researcher Dealroom. And investment in companies using precision fermentation doubled last year from 2019, to almost $600 million, the Good Food Institute reports. "What you're trying to do is move from a product that may initially just appeal to vegetarians or vegans and bring it more mainstream," says Mark Lynch, a partner at Oghma Partners, a corporate finance advisory company in London.

Although it may be possible to create a substitute milk that's indistinguishable from the real thing using precision fermentation, the increasing quality of beverages made from oats, soy, almonds, or rice has spurred newcomers to focus on higher-margin dairy products. Formo, a startup in Berlin, has gotten $50 million in funding to develop its mozzarella and ricotta offerings and plans to add mature and ripened cheeses such as cheddar and Gruyère. Starbucks Corp. has tested ice cream from Perfect Day Inc. And Nobell, a startup in San Francisco backed by Bill Gates, genetically modifies soybean plants to make dairy proteins instead of soy proteins. "If we create products that compete on taste and on price and eventually are cheaper than buying it from an animal source, people are going to make more of these choices," says Nobell founder Magi Richani.

Nobell expects to introduce its first products in 2023, and Perfect Day plans to add cream cheese in the coming months, but it will likely be years before the technology is truly competitive with traditional cheeses. And in Europe, regulators may be slower to approve such foods over concerns about the genetically modified cells the method requires—though the modifications are needed only to get the process going, and there will be no such cells in the final products.

In the meantime, companies are working on less complicated alternatives. In California, Miyoko's Creamery recently introduced a cashew-based vegan mozzarella for pizza. Sweden's Stockeld Dreamery makes a feta substitute from fermented peas and fava beans. And Motif FoodWorks in Boston is developing a corn-based cheese while it works on precision fermentation. "You can actually get a plant-based cheese to melt and stretch and bubble and have the gooey texture consumers expect," says Mike Leonard, Motif's chief technology officer.

One question is what to call the stuff made using precision fermentation, with some suggesting "lab-grown cheese" and others leaning toward "cultured" or "cultivated." Dairy groups in various countries have objected to soy- and oat-milk producers labeling their products "milk," so they'd probably have a similar problem with cheeses made with precision fermentation. And because a copy of cows' milk DNA is used to get the ball rolling, some vegans may reject the products. "These companies are potentially using the cow DNA," says Chantelle Adkins of the U.K. Vegan Society. "We would have to consider where that came from."

Korteweg, too, is hedging his bets with a plant-based offering—a spread he makes together with the producer of Old Amsterdam cheese—to keep the company going until his precision fermentation work starts to pay off. He says he's in frequent talks with companies around the world and that, as a self-professed cheese lover, he's eager to sample vegan versions of varieties from asiago to zwitser. "If you have the identical casein, you can make all kinds of cheese," he says. "It's our goal to copy them all." —*Áine Quinn*

THE BOTTOM LINE With sales of vegan cheese substitutes on track to increase more than fivefold by 2025, investment in precision fermentation startups doubled last year, to almost $600 million.

A Food Fight That Matters

A host of new apps help connect consumers with meals that would otherwise go to waste

By day, Laura Gaga works as a civil servant in London. Her evenings and weekends, though, are dedicated to reducing food waste. On a typical Sunday afternoon, Gaga, 41, checks an app called Olio to see whether her local Tesco supermarket or Pret a Manger sandwich shop has listed items for free collection. Then she zips over to round up loaves of bread, produce, and wraps not expected to sell before their "use by" date. Back home, she uploads details of her bundle to the app for neighbors to claim.

Gaga, who also blogs and produces a podcast about food sustainability, is one of 30,000 volunteers in 59 countries who use Olio. "Living in London, you don't have to walk very far to find someone who is hungry or homeless," she says. Food waste "is unnecessary, and something that we can all do something about."

Waste from the food industry accounts for as much as 10% of global greenhouse gas emissions, according to the United Nations Environment Programme, including gases from food production and the methane released when it breaks down in landfills. The UN says 14% of food is lost from harvest to retail—$400 billion worth of items that consumers never see—and 17% of total food production makes it to market only to be thrown out by retailers, food service providers, or consumers.

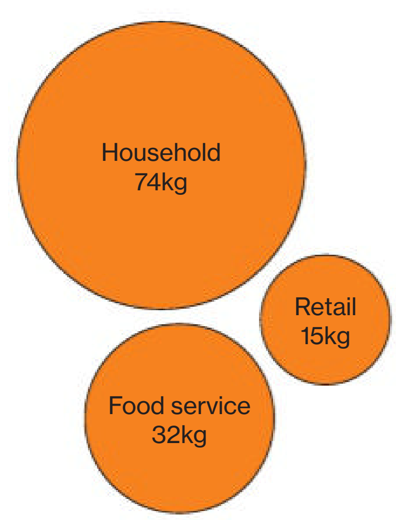
To build awareness of the problem, food waste apps are sprouting up, offering consumers an opportunity to help fix it. "We are only just starting to scratch the surface when it comes to this issue," says Mette Lykke, chief executive officer of Too Good To Go, a Copenhagen-based app that lets consumers in 15 European countries pick up discounted pastries and other items left at the end of the day at bakeries and cafes.

Too Good To Go, which has 46 million users, takes a cut of the price consumers pay for the food it diverts, and says it has saved 96 million meals from being tossed. Olio says it's funded by fees supermarkets and shops would pay disposal companies to haul the food away. The company says it's saved 32 million servings, almost 3 million pounds in 2020, mainly in the U.K.

French supermarkets are forbidden from destroying unsold food and are ordered to donate it instead. But in many countries, the donation of excess food to charitable organizations by food business operators is limited because of legal and other hurdles, including tax barriers, liability, and date-marking issues. In the U.K., the nonprofit FareShare, which annually redistributes 5.2 metric tons of surplus to charities, says subsidies for anaerobic digestion plants make it cheaper for farmers to toss food into a biogas digester than get it to hungry people. Even when grocery stores or farmers are prepared to divert surplus food to charities, it's a logistical challenge to get it to the right place—often soup kitchens or homeless shelters—in time for consumption.

That's where apps can come in. Kitche, a fledgling app with 25,000 users in the U.K., is going after households, the source of 61% of food waste, according to the UN. Kitche lets users keep track of what's in the fridge by scanning supermarket receipts and reminding them when food is about to go bad. The company says regular users save 8.2 kilograms (18 pounds) from being tossed unnecessarily each year.

Annual food waste per capita, global average

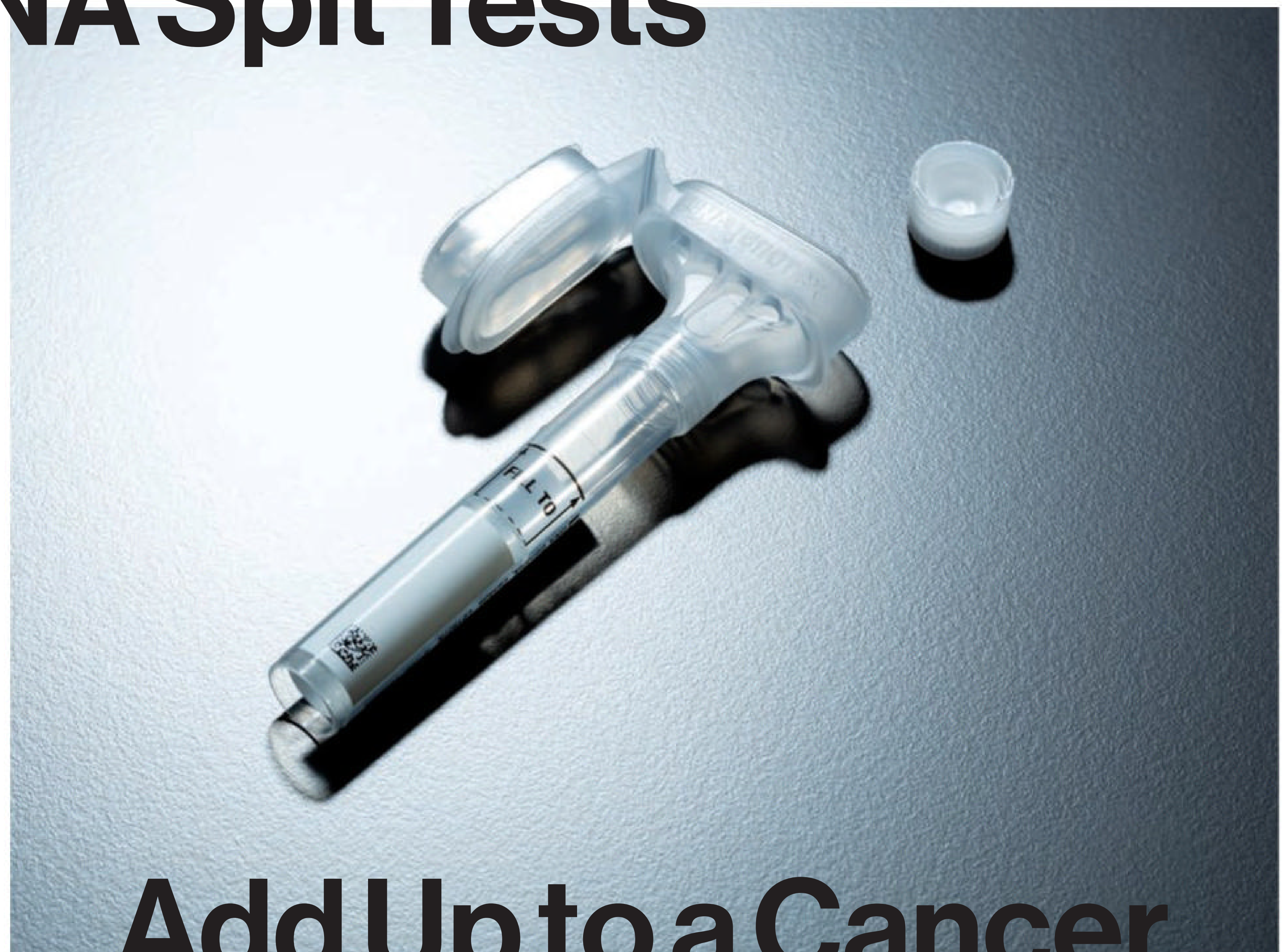


While consumers can play a role in curbing waste, big food companies can have the greatest impact, says Rob Opsomer of the Ellen MacArthur Foundation, which campaigns to make the economy more sustainable. One option, championed by a group called the Upcycled Food Association, is to use surplus ingredients to make longer-lasting products such as veggie chips, snack bars, or baking mixes. Nestlé SA, for instance, has piloted Krumm Glücklich ("Crooked But Happy"), a line of soups made from vegetables that would otherwise be thrown away. "We need to move upstream," says Opsomer, "and look at the major companies that put the products on the market in the first place and move millions of tons of materials." —*Áine Quinn and Flavia Rotondi*

THE BOTTOM LINE Waste from the food industry accounts for as much as 10% of global greenhouse gas emissions, the UN reports, including gases from food production and the methane released when it breaks down in landfills.

ILLUSTRATION BY AARON FERNANDEZ. DATA: UNITED NATIONS ENVIRONMENT PROGRAMME ESTIMATES FOR 2019

Can 8.8 Million DNA Spit Tests



Add Up to a Cancer Breakthrough,

Or Just a Privacy Nightmare?

23andMe is using its customers' genetic data to try to become a new kind of pharma company

By Kristen V. Brown
Photographs by McNair Evans

A few months ago, on the morning 23andMe Holding Co. was about to go public, Chief Executive Officer Anne Wojcicki received a framed sheet of paper she hadn't seen in 15 years. As she was preparing to ring in the Nasdaq bell remotely from the courtyard of her company's Silicon Valley headquarters, Patrick Chung, one of its earliest investors, presented her with the pitch document she'd shown him when she was first asking for money, reproduced on two pieces of paper so she could see both sides. The one-sheet outlined a radical transformation in the field of DNA testing.

Wojcicki's plan back then was to turn genetics from the rarefied work of high-end labs into mainstream health and quasi entertainment products. First she'd sell tastemakers on her mail-in spit kits as a way to learn sort-of-interesting things about their DNA makeup, such as its likely ancestral origins and the chance it would lead to certain health conditions. Eventually she'd be able to lower prices enough to make the kits broadly accessible, allowing 23andMe to build a database big enough to identify new links between diseases and particular genes. Later, this research would fuel the creation of drugs the company could tailor to different genetic profiles. 23andMe would become a new kind of health-care business, sitting somewhere between a Big Pharma lab, a Big Tech company, and a trusted neighborhood doctor.

Some of this still sounds as far off now as it did during the Bush years. Improbably, though, 23andMe has rounded second base and is heading for third. Wojcicki did sell millions of people on DNA test kits—11 million and counting—and bring such tests to the mainstream, with some help from Oprah's holiday gift guide. An estimated 1 in 5 Americans have turned over their genetic material to 23andMe or one of its competitors. Now that she's got the data, Wojcicki is working on the drugs. Her company is collaborating on clinical trials for one compound (and nearing trials for another) that could be used for what's known as immuno-oncology, treatments that attempt to harness the body's complex immune system to beat cancer. 23andMe says it's also exploring drugs with potential use in treatments for neurological, cardiovascular, and other conditions, though it declined to specify them. Last month the company bought Lemonaid Health, a telehealth and drug delivery startup that offers treatment and prescriptions for a select group of conditions, including depression, anxiety, and STDs.

Chung, now a co-founder and general partner at the venture capital firm Xfund, says his framed gift to Wojcicki was meant to emphasize how exceptionally closely she stuck to her original vision for 23andMe over the past decade and a half. Most young tech companies in search of their initial venture funding have little hope of identifying their eventual path to great wealth and instead focus their energies on some sort of "dancing startup laser light show," he says. "The rule, not the exception, is that whatever the founders are pitching at the very earliest stages is simply never the thing that is successful." 23andMe went public in June at a market value of $3.5 billion, is now closer to $5 billion, and is expected to report about $56 million in revenue in its latest quarter, though it's unlikely to turn a profit.

Of course, Wojcicki, a former Wall Street research analyst with a focus on biotech, did have some experience with outstanding startups. Soon after she closed that round of venture funding, she married longtime boyfriend Sergey Brin, who co-founded Google in her sister Susan's garage. (Wojcicki and Brin divorced in 2015.) It's easy to see the Google influence in 23andMe's strategy—collect all the data, derive whatever insights you can, and find an adjacent line of business with the potential to yield much bigger profits. Even today, Wojcicki's conversations tend to be shot through with an older strain of Web 2.0 techno-optimism about ways to better connect people with, in this case, how their medicines get made, and to cut through the randomness and waste that suffuses the science of drugmaking. "One of our core values is, like, we're all in this together," she says. "One thing I always think is a tragedy is that you develop a drug and then people hate you. I'm really interested in, can we actually be the first drug development group that is loved by people?"

The next phase of her master plan might sorely test that question. While it's difficult to imagine anyone saying they love their pharmaceutical company, it wouldn't be crazy for the 8.8 million 23andMe customers who once absently checked a box saying yeah, sure, use my data for whatever, to feel like they've been bait-and-switched now that their genes are laying the groundwork for potential cancer cures.

Privacy advocates have been warning for years that the spit-tube deal is lopsided—that there aren't enough legal protections on genetic data to justify trading DNA samples for answers about whether you're predisposed to hate cilantro or what percent Swedish you are. DNA data, which contains information about you and your blood relatives, could be hacked, de-anonymized, or shared with the police. 23andMe's pharma ambitions add a new dimension to these concerns. If Wojcicki keeps achieving her goals, customers might one day pay 23andMe to assess their disease risk and pay for a treatment it later develops based on their DNA. Why should one company hold the key to the world's genetic code—and charge the rest of us handsomely for access to it?

And before 23andMe reaches that threshold, it will have to deal with the reality that Big Pharma is hard. The company is trying to expand from a category of modest consumer products into a field full of goliaths a couple of orders of magnitude larger, with research and development operations that dwarf anything it's fielding. "Genetics is just one little piece of the puzzle," says Harvard geneticist Robert Green. "So far there have only been a few instances where genetics has been the key to a brand-new drug. It's not yet clear it's going to have the value we're hoping it does."

For now, Wojcicki's answer to both sets of concerns is, basically, Trust Us. "I always like to say, 'We'll win you over,'" she says.

From the moment the first draft of the human genome was published in 2001, scientists have evangelized the potential of genetic data to discover and develop drugs. That's ▶

“I always like to say, ‘We’ll win you

◀ because Big Pharma’s process, for all the billions of dollars in annual R&D spending, remains a crapshoot. The mysteries of human biology mean that, more often than not, promising drug candidates, even those that make it deep into clinical trials, wind up not working. The industry calls that period between the lab and the market the Valley of Death. An estimated 13% of all global drug development programs end in approvals. Even then, drugs can inexplicably work well for some people and not others. To this day, researchers sometimes can’t explain the molecular mechanisms that underpin common medications.

Given enough data, genetics can identify patterns that provide significant clues. When you’re hunting for what might be a few letters of variation among 3 billion pairs of DNA nucleotides, scale is what matters. Often, many genes contribute to a particular condition to varying degrees, so more examples give researchers more chances to puzzle out how they fit together.

Wojcicki and her co-founders weren’t the first to think of building a database for this purpose, but using consumer DNA kits as an input soon gave her company a massive scalar advantage over pretty much everyone. (The only bigger known databases belong to Ancestry.com and the Chinese government.) 23andMe started selling its kits in 2007, pitching them mostly as a way to assess a smattering of health traits, such as a customer’s risk of colorectal cancer or likelihood of lactose intolerance, along with a rudimentary version of its ancestry analysis. Criticism soon followed. One article, published in the journal *BMJ* in 2008, argued that “rather than improving health, widespread genetic testing is likely to result in widespread anxiety.” On these sorts of grounds, the U.S. Food and Drug Administration forced the company to stop selling its tests without approval in 2013. Other critics questioned whether consumers could self-report their own health data accurately. 23andMe relies on customers to help its analysis along by flagging known health issues—whether a given person has a heart condition, for example, or an autoimmune disorder.

Eventually, with copious peer-reviewed research, 23andMe won over the scientific community and the FDA, which allowed it to resume selling the tests in a pared-down form in 2015. Today the company sells an ancestry test for $99, one with health “insights” for $199, and a subscription service that includes reports on heart health and a person’s particular response to different medications. For most Silicon Valley companies, hoarding the test-kit data and selling it to drugmakers would have been the endgame. Instead, 23andMe is trying to make the drugs, too.

The company’s 100 staff scientists, hired over the past six years, work out of its therapeutics offices in South San Francisco, half an hour north of its headquarters in Sunnyvale, Calif. While the Sunnyvale campus is all glass and contemporary opulence, the therapeutics lab is a drab, squat complex with a 1980s flavor. (On the other hand, it’s tough to knock the sweeping bay views.) The scientists worked through the pandemic here, at lab benches spaced for social distancing, with thick cables running from the benchtops to the ceiling.

The facility is divided roughly into halves, each with its own offices and labs, by a big room for shipping and receiving and an even bigger set of storage chambers for gases, chemicals, and distilled water. On one side, robots make the drug prototypes. There are robots for pipetting DNA into cells, robots for purifying liquids, and even robots that just swirl containers of liquid for a certain amount of time. On the other side, scientists suss out the basics of how genes and diseases are connected, often performing tasks by hand at their benches.

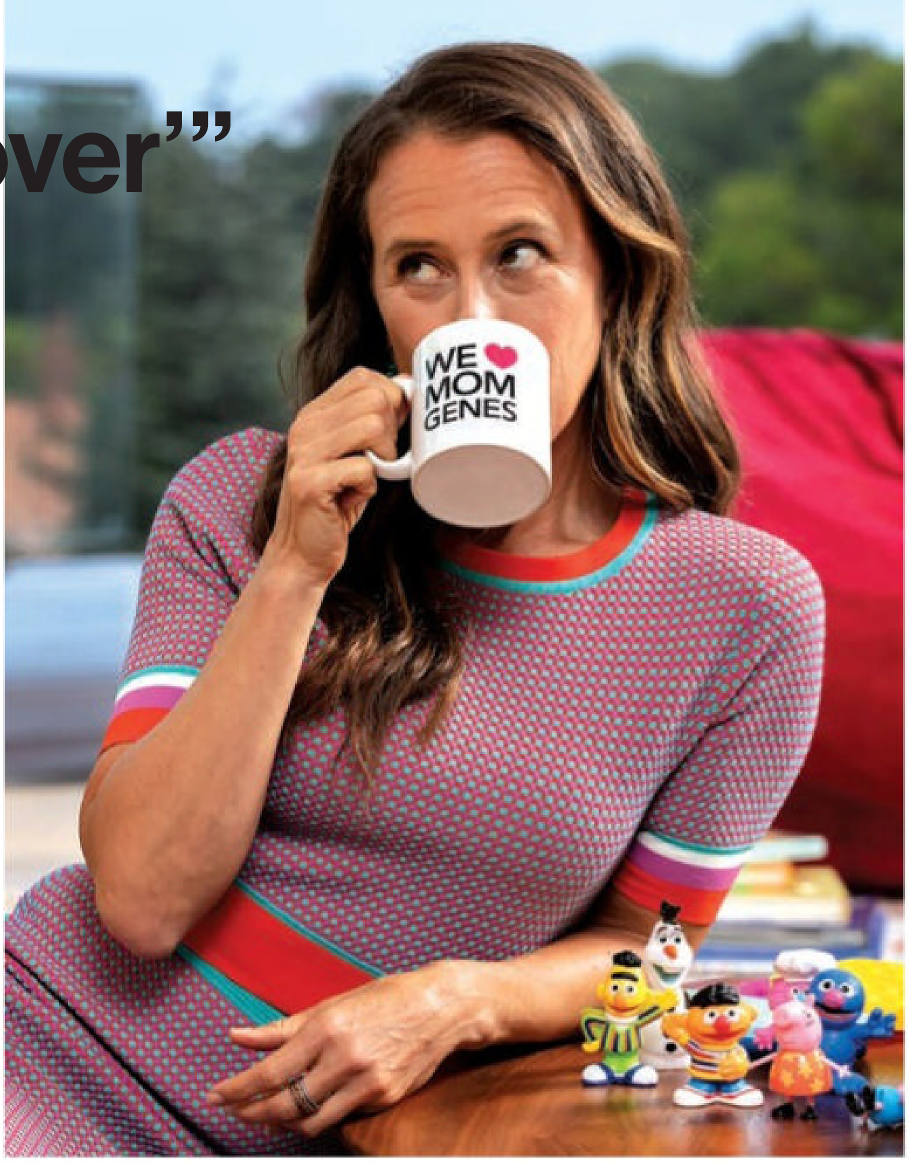
Aside from the research scientists, the staff is mostly working remotely, and the rows of empty cubicles lend the more corporate parts of the office the feeling of a startup in the aftermath of the dot-com bust. The labs, though, have remained busy. During the company’s last fiscal year, from April 2020 to March 2021, it roughly doubled its number of good potential drug candidates, as evaluated by its scientists, to 19. Their focus: diseases that 23andMe has lots of data on, that many people suffer from, and that lack good treatment options. “We prioritize based on power, need, and speed,” says Kenneth Hillan, head of the therapeutics division.

Every six months or so—after, say, a big post-holidays influx of customers—23andMe’s computational biologists scan the company database looking for variations that, based on correlations in the company’s massive database of human DNA, appear more common among people with particular diseases. Turning that hint of where there might be treasure into a map where X marks the spot takes many months of research in the dreary building full of scientists. But the database has the potential to narrow to months a process that otherwise might take many years.

While pharma companies typically specialize in a few kinds of treatments, 23andMe can instead direct its research wherever the data takes it, and it has a ready supply of possible future clinical-trial participants and customers. The end result is the potential to develop drugs more quickly and efficiently than the status quo. This has made it an attractive partner to traditional drugmakers, notably GlaxoSmithKline Plc, which took a $300 million stake in 23andMe in 2018. Within a year, GSK and 23andMe already had six potential targets in the works. One candidate, a cancer drug that works to block CD96, a protein that helps modulate the body’s immune responses, entered clinical trials in four years. The industry average is closer to seven.

In the case of the drug 23andMe is developing in-house, scientists discovered a biological pathway, or series of molecular actions that lead to a change in a cell, strongly associated with the way immune cells attack a certain kind of tumor. The drug is designed to block the tumor-induced suppression of the immune system’s T cells and then reactivate the immune system’s response to the tumor.

Sometimes the database can also highlight new uses for existing drugs. “The size has opened up the opportunity to be able to see genetic associations that you can’t see anywhere else because you need the math of the numbers to over’”



be able to see it,” says John Lepore, GSK’s head of research. At one point, a genome-wide association study showed that multiple genes within a particular pathway appeared to be linked to asthma. There was already an antibody drug in development for asthma by another company that works by blocking the action of that pathway. 23andMe scientists were able to further interrogate the database to find that drugging that pathway might also help to treat a certain rare disease.

Wojcicki is now gearing up to shift more toward solo projects. That was a big reason why 23andMe went public in June, via a merger with VG Acquisition Corp., a special purpose acquisition company, or SPAC, founded by billionaire Richard Branson. By March of next year it expects to have its first drug developed fully in-house in clinical trials, and it says its Phase I trial with GSK should return data by the end of 2022.

Skeptics, however, argue it’s unrealistic to expect the company to be great at drug development right from the start, especially as it decouples its efforts from Glaxo and other experienced developers. “If they try to travel this road by themselves, it will be perilous,” says Bernard Munos, a researcher and senior fellow who focuses on biomedical innovation at the Milken Institute, a conservative think tank. “It’s like sending a man to the moon. On paper it may look fairly straightforward, but the details are what will cause the enterprise to succeed or fail.”

Before the company’s second post-SPAC earnings report, on Nov. 10, Wojcicki says she’s still working out what the integration of Lemonaid will look like. For starters, 23andMe will train Lemonaid’s fleet of doctors on how to make use of genetic information and try to keep its services cheap enough that insurance doesn’t have to get involved. (Lemonaid’s services, like consumer DNA kits, aren’t covered.) “When I think back on the original promise of genetics, it’s been adopted in cancer treatment but not at all in primary care,” she says, adding that the company is trying to figure out what actionable health recommendations based on genetic risk factors should be. In the early going, that will most likely mean using its pharmacogenetics reports–which help determine which drugs are likely to work best for an individual–when prescribing drugs through Lemonaid doctors. Your genes can affect how well you metabolize certain drugs and may influence, for example, which antidepressant or antifungal works best with your biology.

Eventually, Wojcicki says, that might lead 23andMe to be involved in customers’ health care in two ways: using the consumer testing to head off illness while the drugmaking side manages those that can’t be prevented. “In five years,” she says, “what I am looking to be measured on is, can we keep people healthier?”

As for whether these new business lines might exacerbate customers’ privacy concerns, Wojcicki’s main counterargument is that the U.S. medical establishment is lousy on privacy, too. For years the buying and selling of health data has expanded dramatically without much doctors or patients can do about it, if they’re even aware. Unlike when you go to the doctor, she says, 23andMe customers have a choice about how their data are used.

Well, kind of. There are no federal laws prohibiting companies outside of a health-care setting from providing individuals’ genetic information to third parties, and the existing protections of genetic data in the U.S. are weak at best. That became clear in 2018, when police used a different, open source database called GEDmatch to make an arrest in the long-cold Golden State Killer murders. Suddenly consumers everywhere were very aware of just how serious the consequences of sharing your DNA can be, which apparently made them less enthusiastic about home DNA kits. 23andMe’s sales dropped off, and layoffs followed in early 2020. While calls to strengthen consumer DNA protections died down during the pandemic, 23andMe’s latest development may help to reignite those efforts.

“They’re transparent, but only to a certain degree,” says Jennifer King, a privacy and data policy fellow at Stanford’s Center for Internet and Society. “My data could be extremely valuable to them.” King says a better system would require a third party to broker data and make sure consumers are compensated fairly.

In some cases, after all, one individual can hold the key to a world of biomedicine. Take the famous case of Henrietta Lacks, whose family struggled in poverty for years after researchers turned her cancer cells into a critical research tool that made millions of dollars. With a far greater range of the human genome decoded, it’s easy to envision a *Gattaca*-esque future in which the DNA of the masses is mined for personalized miracle cures affordable only to the super rich.

Wojcicki says that’s just not going to happen. “We’re not evil,” she says. “Our brand is being direct-to-consumer and affordable.” For the time being she’s focused on the long, painful process of drug development. She’d like to think she’s earned some trust, but she hasn’t come this far on faith. B

THE POWER GRID Casino

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When GreenHat Energy collapsed after blowing millions of dollars speculating on power prices, it made something plain: Energy traders are gamblers, and ratepayers back every bet

By David Kocieniewski and Naureen S. Malik

One morning in January, Andrew Kittell climbed into his gray Toyota pickup and drove to the top of the San Diego-Coronado Bay Bridge. He parked in the service lane and got out, leaving his driver's license in the car. He walked toward the railing.

Kittell was a trader in the market for financial transmission rights, also known as congestion contracts. These are essentially bets that at specific places and times, demand for electricity will rise enough to create bottlenecks, or congestion, on the power grid, causing prices to jump. The tools of this trade are weather forecasts and demand curves and proprietary prediction models; the field tends to attract understated, cerebral people. But Kittell was an outlier, an extrovert prone to testing limits. A decade earlier, he'd helped JPMorgan Chase & Co. make more than $125 million in California's and the Midwest's electricity markets, only to have regulators accuse his team of gaming the system. The bank settled the case by paying $410 million in penalties and relief. Kittell himself wasn't penalized, and nobody admitted any wrongdoing.

Then, in 2014, he and two colleagues launched a company that began trading congestion contracts and quickly amassed a portfolio that dwarfed all others in the regional market in which it operated. In less than four years, that company, GreenHat Energy LLC, defaulted on its debts and lost almost $180 million. Kittell and his partners became targets of civil lawsuits and possible criminal action: The Federal Energy Regulatory Commission's enforcement staff has alleged that GreenHat fraudulently exploited regulatory gaps to acquire its huge array of positions on credit with very little collateral. In simple terms, FERC says it pursued a strategy of buying a boatload of contracts, cashing out the best, and walking away from the rest. Other market participants, including utilities and their customers, were left to cover the losses.

On Jan. 6, one day after FERC's investigators served notice that they were forging ahead with fraud allegations, Kittell made the morning drive to the Coronado Bridge. A security camera on the bridge captured him climbing the railing and jumping. He was 50.

Legal arguments over GreenHat's conduct and FERC's investigation might continue for years. Attorneys for Kittell's estate and the company's surviving principals say their clients did nothing illegal. But the damage done by GreenHat's trading reveals an inherent risk in the U.S. power system. The contracts the company was dealing in were designed to allow utilities to offset spikes in the cost of electricity they buy and then provide to homes and businesses. Speculators are part of this ecosystem—but no one had seen a speculator ▶

◀ like GreenHat. The company played the game an entirely different way, and regulators weren't ready. It's not clear that they're ready now, should there be another GreenHat.

Anyone who pays a utility bill in the U.S. is familiar with the symptoms of an aging power grid perpetually in need of upgrades. Less visible are the entities that bet on, and make multimillion-dollar profits from, the grid's shortcomings. GreenHat's story shows that not only do American power customers have to contend with high electric bills, rolling blackouts, and increasingly common outages—they're also underwriting a trading system that allows speculators to pocket the winnings and sticks ratepayers with some of the biggest losses.

Andrew Kittell grew up in the shadow of Wall Street. His father, Donald Kittell, was an executive with Morgan Stanley Dean Witter and later served as the chief financial officer for Sifma, the Securities Industry and Financial Markets Association. Andrew liked excitement—he skied and surfed—but told friends he'd learned from summer jobs on Wall Street that he didn't care for financial risk. At Columbia Business School, he wrote in-depth research on the odds of winning at a casino, reaching conclusions that soured him on gambling, close associates say.

Kittell was hired out of school by Bear Stearns, for a unit that aimed to wring profit from the investment bank's portfolio of power plants. After Bear's 2008 bankruptcy, he wound up in Houston at JPMorgan Ventures Energy Corp. (JPMVEC), where he worked alongside fellow trader John Bartholomew. Bartholomew had spent years as a power purchaser at a Southern California utility; he boasted on his résumé that the experience had taught him how to take advantage of flaws in the state's payment formulas for power generators.

In the broadest terms, power traders try to anticipate when demand will rise and supply will falter. JPMVEC did all that—and also focused on finding rules it could exploit. One example: During

▲ Kittell

times of heightened demand, California officials would pay plant owners hefty ramp-up fees to bring more generators online. So JPMVEC wouldn't switch on the handful of plants under its control until it could charge as much as 83 times the normal price of power. The plants would run for a bit, then shut down to await the next demand peak. In all, the firm employed 12 different strategies that federal officials determined went beyond typical behavior and were designed to game the system.

According to internal emails, senior JPMorgan executives expected the power unit to reap hundreds of millions of dollars, but by 2013 regulators had intervened. JPMorgan agreed that year to the second-largest settlement in FERC's history: It paid a $285 million fine for what the settlement called "manipulative bidding strategies" and returned $125 million more in "unjust profits."

The next year, Kittell, Bartholomew, and a third JPMVEC alumnus, Kevin Ziegenhorn, formed GreenHat. Through their lawyers, Bartholomew and Ziegenhorn declined to comment for this story.

FERC is the main enforcement authority for U.S. electricity markets, but consumers' first line of defense consists of four regional transmission organizations, or RTOs, and three single-state independent system operators, or ISOs (New York, California, and Texas have their own grids). These private companies grapple with a system that is part Escher, part Rube Goldberg. Day to day, the essential task is balancing supply and demand—and the power flow has to be precise, at a frequency of 60 hertz, or the grid can become unstable. It's a daunting task considering that the grid is a sprawling patchwork cobbled together from lines running along paths built a century ago and vulnerable to challenges as unpredictable as extreme weather, mechanical breakdowns, falling tree limbs, cyberattacks, and solar flares. The grid operators also run the markets for financial instruments based on the cost of those disruptions.

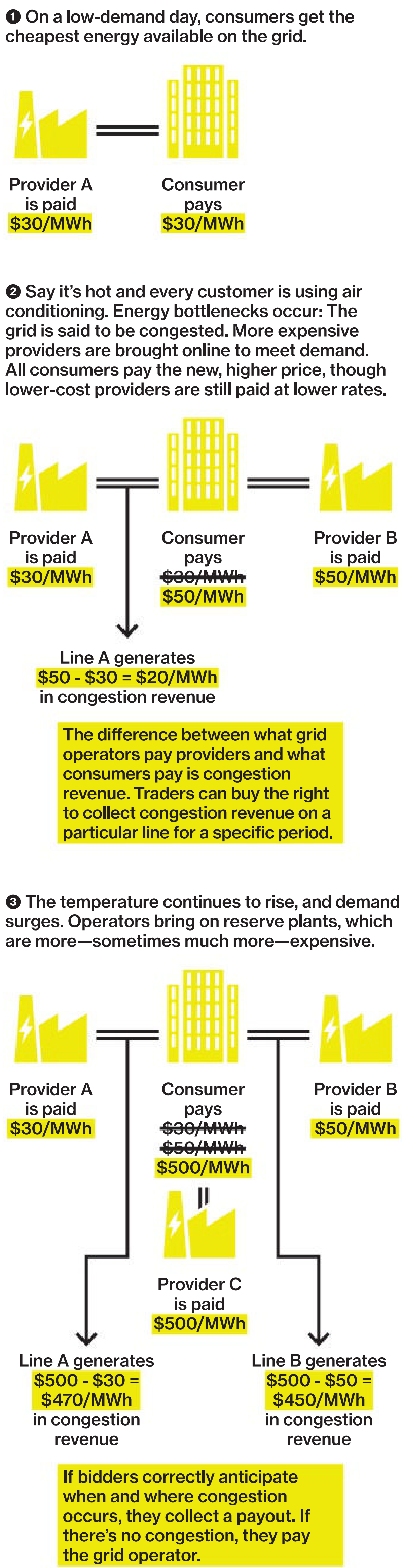
GreenHat traded in a market operated by the largest of the grid keepers, the RTO known as PJM Interconnection LLC. PJM (the name originally stood for Pennsylvania, New Jersey, and Maryland) directs power from 1,400 generators through 85,100 miles of high-voltage cables in 13 Eastern states and the District of Columbia. Its 65 million electricity consumers have been spared the widespread blackouts that have affected tens of millions of people in Texas and California lately, but they've paid for that stability.

PJM is supposed to balance the interests of power companies, consumers, and communities, but for years it's allowed major suppliers such as Exelon, Duke Energy, and American Electric Power to bill ratepayers for high-priced upgrades to sections of the grid where they predominate, according to an assortment of studies. Ari Peskoe, director of the Electricity Law Initiative at the Harvard Law School Environmental and Energy Law Program, says PJM's reliable checkoff on new projects allows suppliers to preserve their market dominance and freeze out competition. It's effectively "a protection racket" for the biggest providers, Peskoe says.

PJM has also allowed power providers owned by Wall Street firms such as Blackstone Inc. and KKR & Co. to tap into the billions of dollars a year PJM pays for what's called reserve generation—the maintenance of clunker plants that are

PREVIOUS SPREAD: PHOTO ILLUSTRATION BY 731; PHOTO: ANDY A. WIDMER/EYE EM/GETTY IMAGES. THIS PAGE: COURTESY KITTEL FAMILY

Betting on Congestion



used only in emergencies, typically a few days a year. That limited role has been a lifeline for aging plants like the 52-year-old Homer City Generating Station in western Pennsylvania, once owned by General Electric Co. It's a coal-burning plant made all but obsolete by the shale gas boom in the surrounding area. PJM pays it to stay online to help meet peak demand. Federal regulators, academics, consumer advocates, and market participants all say PJM pays for far too much capacity. PJM disagrees.

GreenHat found a similarly accommodating environment in PJM's market for congestion contracts. Grid operators dole out rights to the excess congestion revenue they collect to utilities and other power suppliers. At regular auctions, the recipients can resell such rights as futures contracts. Winning bidders, including speculators like GreenHat, acquire their positions on credit; no money changes hands until the contracts' terms end. That can be years in the future.

Similar markets operate around the country, but GreenHat found PJM's especially attractive. In comments to close associates, Kittell cited one particular aspect: PJM allowed traders to buy large numbers of congestion contracts while posting very little collateral. To secure the positions that ultimately lost $180 million, PJM required GreenHat to pledge less than $600,000, FERC records show.

PJM declined to comment on the GreenHat case, citing FERC's ongoing investigation. In emailed statements, PJM has said that since GreenHat's default it has implemented "a comprehensive overhaul of credit reform, mitigation policies and procedures" that include stricter collateral requirements and the appointment of a chief risk officer in 2019. The new policies give PJM officials "authority to limit, rescind or terminate participants."

PJM has also closed another regulatory gap. When GreenHat set up shop, PJM had no screening process in place for new traders or trading firms. It does now. The applications of the GreenHat executives were approved without so much as a Google search.

Anyone who's paid surge pricing for an Uber has a general idea of what creates congestion revenue: Prices and surcharges climb steeply whenever demand exceeds suppliers' capacity. In the electricity market, there are additional wrinkles. Overloading a power line causes wires to retain heat and stretch, putting them at risk of failure, so grid operators like PJM have to balance the limited capacity of the lines against the ceaseless ebb and flow of demand. When needed, they bring on additional power providers, at higher prices. Say the price on a given day is $30 per megawatt-hour. When there's a little pressure on supply, that might rise a few dollars. As the pressure increases it might double, then increase tenfold, then twentyfold. PJM finally caps prices at $1,000 per MWh—but in the most extreme conditions they could surge to $3,750. Next year those prices can rise to more than $12,000.

When prices jump, grid operators charge every ratepayer the new, higher price—even though the initial providers continue to receive the previous, lower price. Imagine you're riding in an Uber economy car when demand leaps so high that the only option available for new riders is limousines. And then imagine that the price you have to pay automatically increases to the limousine rate—even though your driver will collect only the economy rate.

The money that grid operators collect from consumers but don't pay to power providers is congestion revenue. During the first six months of this year, consumers in PJM's service area kicked in $354 million in such revenue, a 97% increase from a year earlier.

Wholesale electricity buyers, such as utilities, use congestion revenue markets to hedge against sudden price hikes. They sell the contracts allocated to them to raise cash, or buy contracts from other utilities and power traders in an attempt to profit from congestion elsewhere on the grid. But the market is open to other traders, too, speculators who never purchase a single kilowatt of power. The idea is that they'll add liquidity and competition. To guide their bids for congestion ▶

◀ contracts, these investors create algorithmic power-flow models that aim to out-forecast meteorologists, civic planners, electrical engineers, and the grid operators themselves.

GreenHat didn't do that.

Kevin Kelley, founder of a Houston energy trading firm called Roscommon Analytics, recalls his first impression of Kittell: "This guy's too personable to be a trader." And his first impression of GreenHat's forecasting strategy: "Alarms went off." Kelley met Kittell in September 2016 at a coffee bar. Kelley had set up the meeting; he was considering offering Kittell a job. It quickly became clear that Kittell was more interested in soliciting investments for GreenHat than working for someone else. So Kelley listened to Kittell's pitch and then asked what he considered the most fundamental question: Who was doing GreenHat's power-flow forecasting? No one, Kittell said.

Kelley was stunned. "It's the most basic step of building a trading company," he says. "Without it, you don't really know the value of what you're buying."

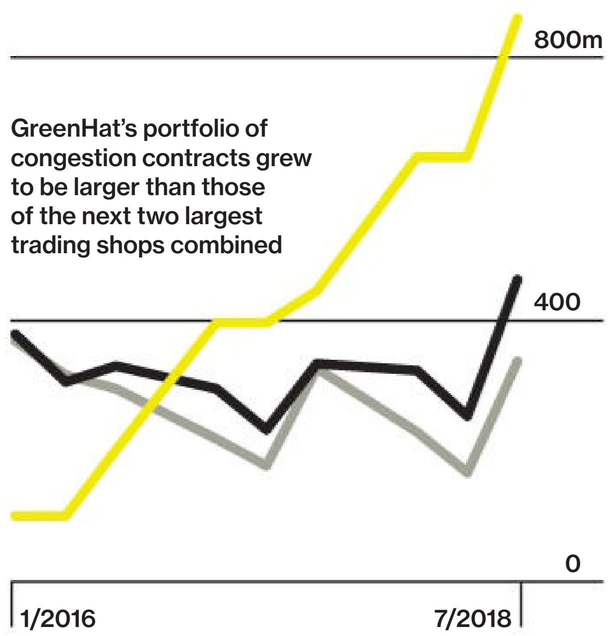
Another financier, who was unfamiliar with the particulars of electricity markets, recalls asking Kittell in 2015 to explain GreenHat's approach. "Do I root for a blizzard?" he asked. "A heat wave? Or a hurricane? How does this work?" Kittell shook his head. "It doesn't matter about the fundamentals," he said. "I'm betting against the model." It appeared that the speculator who hated risk thought he'd found a way around it.

Alone among the investors in this market, GreenHat wasn't trying to predict congestion patterns. As the company told prospective investors, its bets were guided by information that PJM itself had developed and published. PJM occasionally put out an Excel spreadsheet showing traders how much collateral they'd have to front if they placed a bid that deviated from the three-year average cost of congestion on a particular part of the grid. A bid below that average would require zero collateral, because PJM considered it such a low-risk bet. That's where GreenHat concentrated its trades.

Going Big

Size of portfolio in MWh

GreenHat / DC Energy / Solios Power



JANUARY, APRIL, AND JULY OF EACH YEAR. DATA: REPORT OF THE INDEPENDENT COMMITTEE OF CONSULTANTS TO THE PJM BOARD

With its unconventional strategy and $3 million in capital that Kittell had kicked in to start the firm, GreenHat began trading in 2014. According to a FERC enforcement staff report, GreenHat quickly lost $2.2 million. Some of its trades left other market participants scratching their heads: It appeared GreenHat was using declining prices as a signal to invest. But other traders, who did far more granular research about the grid than GreenHat, recognized that many low-cost contracts were getting cheaper for a reason: Natural gas prices were declining and new transmission lines were being completed. GreenHat was betting on congestion in places where congestion was being eased.

GreenHat tweaked its strategy. It had initially purchased short-term contracts, but beginning in 2015 it focused on buying positions that would settle further in the future, according to internal company documents and FERC records.

In other words, a trader that said it had no forecasting method of its own began trying to see further ahead. Even now, almost five years after their meeting, Kelley says he's not certain whether Kittell was too naive to know he was flirting with disaster or too cynical to care.

FERC's enforcement staff has its own view: It concluded that GreenHat's trades weren't naive at all. In legal filings, FERC officials describe the firm's trading strategy as a textbook example of a *Sopranos*-style bust-out scheme. In a bust-out, criminals max out a business's line of credit, "busy themselves disposing of their purchases at substantial discounts," and then walk away without repaying creditors, FERC says.

GreenHat's lawyers have denied that characterization. The company tried to buy profitable contracts, the lawyers said in a filing with FERC this summer; at one point GreenHat calculated that its portfolio stood to make $146 million in profit. "Using PJM's valuation methodologies, GreenHat expected to make money—a lot of it," the firm claimed in its response.

In fact, GreenHat did make some money. PJM allowed its congestion traders to make side deals, so GreenHat began harvesting groups of its most promising contracts and selling them to other traders at reduced prices in exchange for immediate cash. For example, Shell Energy North America purchased an assortment of the firm's contracts at a discount in 2016 and 2017; GreenHat got $1.49 million upfront. In all, the company made four bilateral deals, according to FERC records, and received $13 million. Kittell and his partners had much of it transferred into their personal accounts, FERC's enforcement report says.

GreenHat's massive buying spree set off alarms among other traders. By early 2017 the firm had purchased tens of millions of dollars' worth of congestion contracts. GreenHat was PJM's biggest trader by far; it held many more contracts than its two closest rivals combined, according to a panel of independent consultants hired by PJM.

A company called DC Energy, one of the market's most consistently profitable players, assessed GreenHat's positions in early 2017. It sent an urgent email to PJM officials that said GreenHat hadn't factored in transmission upgrades that had eased congestion in various spots and stood to lose tens of millions of dollars.

PJM initially brushed that warning aside. Two months later, it reexamined GreenHat and concluded that it was ▶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◀ in fact exposed to $35 million in losses. It banned GreenHat from trading. The ban lasted less than three weeks, because PJM officials worried that GreenHat might sue, according to the consultants' report.

When PJM officials asked GreenHat for additional collateral, Kittell told them Shell Energy North America owed his firm $62 million, according to FERC records. But Kittell wouldn't give PJM permission to ask Shell for confirmation of those receivables. PJM decided against approaching Shell without GreenHat's approval.

With its trading privileges restored, GreenHat went on a new buying spree, offering the $62 million it said it was owed by Shell to offset any future losses. Now the company focused on contracts that would reduce its immediate collateral requirements even further. During the final eight months of 2017, GreenHat managed to increase the size of its portfolio by more than 50% while cutting its collateral requirement by 90%.

Bartholomew and Ziegenhorn stepped away from GreenHat in January 2018, selling their shares to Kittell. That April, PJM revamped its method for calculating collateral requirements, using a new market analysis system with at least one significant improvement: In assessing potential congestion, it could factor in plans for grid upgrades. Using its new tool, PJM informed Kittell that GreenHat was in danger of defaulting. At least three other firms joined DC Energy in warning PJM about the risk in GreenHat's portfolio. Nonetheless, PJM allowed the firm to keep trading.

The next month, the wheels came off. PJM officials learned Shell was disputing that it owed GreenHat any money. PJM demanded new collateral. GreenHat was unable to pay, and on June 21, 2018, PJM declared the firm in default.

Why didn't PJM act earlier? The consultants identified three reasons: First, the fear of a lawsuit. Second, PJM underestimated the losses. (Just weeks before GreenHat's default, an internal PJM analyst had concluded that its portfolio "had a positive value," according to an email unearthed in the FERC probe.) And third, it dismissed the other traders' warnings as professional jealousy.

In truth, the other firms had a financial incentive to worry about their rival trader. PJM handles defaults by apportioning losses among all market participants—including utilities, which pass the cost to consumers. When GreenHat defaulted, it cost them all.

The theory is that auctions for congestion contracts will produce enough revenue for the utilities to roughly equal what they pay in congestion increases. But in reality, there's too little competition for many contracts in the auctions. As a result, less than 80% of congestion revenue goes back to the utilities, and hence to consumers, in many years. This year, PJM is on track to return less than half. Financial traders will pocket most of the rest.

As investigations and lawsuits swirled around Kittell, he told friends and confidantes that he'd broken no laws. He said overzealous regulators had upended his life and unfairly smeared his reputation, because of what he called their resentments over the JPMorgan case. He was looking forward to his day in court, he said—though as his legal bills mounted, he told one person that he worried he'd run out of cash before he could clear his name. Three days before Christmas 2020, FERC sent Kittell a settlement offer, indicating that it would forge ahead with its case unless he paid more than $200 million in fines, according to people familiar with the matter. A little more than two weeks later, he made his final drive to the bridge. He left behind a wife and two children.

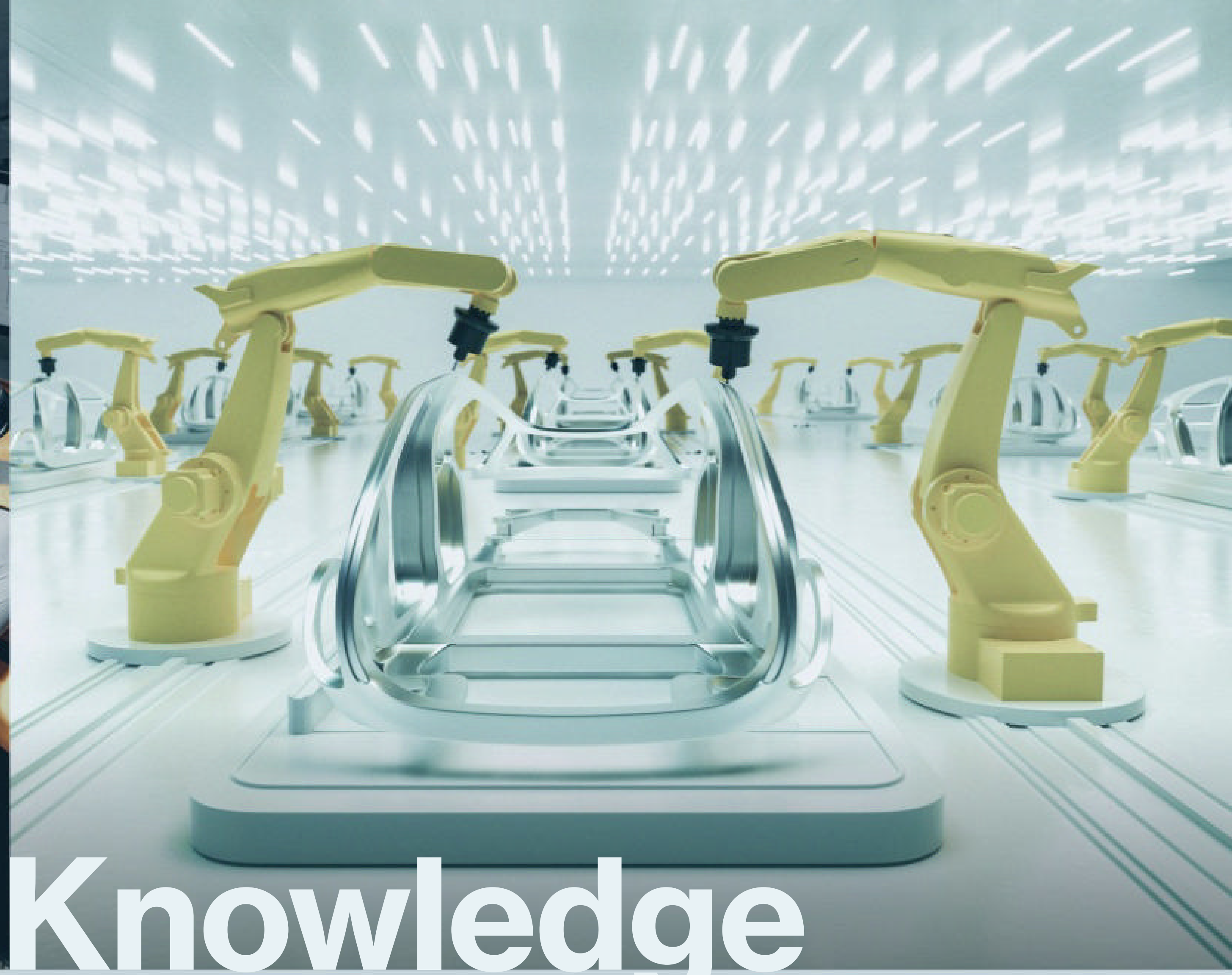
FERC has continued to investigate Bartholomew and Ziegenhorn; it's seeking $242 million in damages from them and from Kittell's estate. That effort can succeed only if the regulator proves that GreenHat's trading was intentionally fraudulent.

"GreenHat's strategy proved mistaken," lawyers for Kittell's estate said in a response to FERC's allegations. "But that does not make it fraudulent." GreenHat's mistake, they said, was relying on PJM's expertise. The lawyers went further: They said FERC's pressure on Kittell pushed him to the edge. "This case drove an innocent man to his death," wrote lawyers at Skadden, Arps, Slate, Meagher & Flom LLP in a July 7 response to the allegations. FERC officials have declined to comment. In an official filing, the agency said members of its enforcement staff "were shocked and saddened to hear of Mr. Kittell's passing. But his death does not relieve staff or the commission of the obligation to evaluate the merits of this proceeding and to enforce the law."

The consultant panel hired by PJM issued a blistering critique. Its report faulted PJM managers for failing to adequately screen or monitor traders, for implementing a faulty credit policy, and for having a fundamental misunderstanding of PJM's regulatory duties.

PJM has adopted some of the changes suggested in that report, and next month a panel of its members is slated to vote on additional changes aimed at increasing the amount of congestion revenue that goes back to the utilities and other companies that serve consumers. Consumer advocates say more fundamental changes are needed. The most "simple and elegant solution" would be to stop creating financial products out of power costs, end the auctions for those products, and just give congestion revenue back to consumers, says Eric Hildebrandt, the market monitor for California Independent System Operator, the state's ISO. He compares the current system to an overly generous casino, "a game that bettors win 60% or 70% of the time."

Hildebrandt is skeptical of claims that such trading makes the transmission system more efficient. If regulators are intent on preserving it, he says, they should let traders bear all the risk. "In every other commodity market, you have a willing buyer and a willing seller," Hildebrandt says. "Here, the ratepayer is an unwitting underwriter. It's not efficient, it doesn't make sense, and it's costing consumers hundreds of millions of dollars a year." Ⓑ

PAPA JOHN IS STILL OBSESSED WITH PAPA JOHN'S

After stepping down three years ago following the revelation that he'd uttered a racist slur on a corporate call, John Schnatter is wandering the wilderness of TikTok and conservative media, criticizing the company he founded even as he dreams of a return

By Devin Leonard Photographs by Tamara Reynolds

Schnatter at his home in Louisville

It was a crucifixion," says John Schnatter. "It was unethical. It was immoral. It was evil." The founder of Papa John's International Inc. is giving an emotional account of his split three years ago with the world's third-largest pizza chain. Yes, Schnatter uttered a deplorable racial slur. Yes, he did so on a corporate conference call. But he says there's so much more to the story.

Schnatter is pleading his case in a building he calls the Outhouse, a hangout spot beside the golf course on his estate near Louisville. He's seated in a leather-bound rocking chair with a decorative animal fleece draped over the back. Sipping from a tall can of Liquid Death Mountain Water, he lists the forces he says played a role in his downfall: duplicitous Papa John's executives, conniving ad agency reps, public-relations incompetents, the "progressive elite left." The last one, he says, has long resented him for taking an operation begun in the broom closet of his father's bar and transforming it into a global chain with more than 5,000 outlets. "The Papa John's story totally debunks the left's ideology," he says. "This is America. You can live the American dream."

Visible through the French doors behind the 59-year-old Schnatter is a tree-lined path leading to a stone bridge over a flowing brook to his mansion, which rises above a rock-encircled pond. Lately he's been teasing his half-million-plus followers on TikTok with glimpses of its opulent interior. Another clip features him strutting to his helicopter, to the sounds of the Notorious B.I.G.'s *Big Poppa*. The message: Sorry, haters. Papa John is still large, if not in charge.

It's hard to think of many entrepreneurs who have personified a company as palpably as Schnatter. When their messy breakup began, he was Papa John's chairman, chief executive officer, and largest shareholder, with 31% of the stock. He was also the company's face, hawking chipotle-chicken-and-bacon pies and exchanging shtick with former NFL quarterback Peyton Manning in TV commercials.

Then Schnatter lost almost everything. In December 2017 he retired as CEO complaining that Papa John's shareholders were being harmed by the NFL, which wasn't punishing Black players and others protesting racism during the national anthem before games. Calling the situation "a debacle," Schnatter said it should have been "nipped in the bud a year and a half ago." Barely seven months later he also quit as chairman, after word leaked about the slur he'd used on the conference call. He'd been speaking with executives from Laundry Service, Papa John's former ad agency, who'd been working with Schnatter on a strategy to counter the perception that he's racist. "I wish I hadn't said the word," he says. He points out that he'd been attributing it to someone else during the call, and he accuses the ad agency people of craftily provoking him into doing so.

Jonathan Maze, editor-in-chief of the trade magazine *Restaurant Business*, says the crisis was comparable to the one Subway faced in 2015 when Jared Fogle, its chief spokesperson, pleaded guilty to receiving and distributing child pornography and to engaging in commercial sex with minors. Yet there was a difference. "When the Fogle thing came down, Subway could dismiss him and try to start fixing things," Maze says. "With Schnatter, it's not that easy."

For Papa John's, it took a corporate exorcism. It wasn't simply a matter of commissioning Schnatter-free TV spots. The company, which declined to discuss its founder for this story, had to remove his face from its pizza boxes and scrub references to him from its website. The pictures of Schnatter on the walls of its Louisville headquarters had to go, too. Last September, Papa John's announced it was relocating many corporate functions to Atlanta, physically distancing itself from its namesake.

All that remained was for Schnatter himself to exit the stage. But as far as he's concerned, he's still Papa John. Since 2019 he's been making the rounds of cable shows and podcasts, many of them conservative outlets where he's hailed as another casualty of cancel culture. "The woke mob doesn't want you to have children's books, as displayed by the cancellation of Dr. Seuss earlier this year," said a host on the One America News Network (OANN), introducing Schnatter in March. "Now they're apparently coming for your pizza."

Schnatter is also seeking to clear his name. He says his exit was orchestrated by some of the company's former officials, the NFL, and possibly even the Democratic National Committee. He's eager to discuss a lawsuit he's filed against Laundry Service, and he's been pointing to a recording of the notorious conference call that he says exonerates him. Papa John's and its former ad agency, naturally, disagree.

As the legal proceedings play out, Schnatter goes about his days, courting his fans' approval. He's cashed out over $500 million worth of stock in recent years, and now he's out there, jetting in his Dassault Falcon between his homes in Kentucky, Florida, and Utah, posting highlights and motivational bromides on TikTok. He's projecting his best life, except his best life is the one he no longer has—the one where he's still running Papa John's.

The morning after detailing his martyrdom, Schnatter wants to show off his mansion. Clad in a black T-shirt, jeans, and white Pumas, he strolls into the dining room. Leaning on a high-backed chair, he points out the room's many wonders: the banquet table he says holds 34 people; the chandeliers that once hung in a London bank; the Raphael-inspired frescoes, in which angels, cherubs, and Biblical characters mingle. "That's Moses getting circumcised," he says.

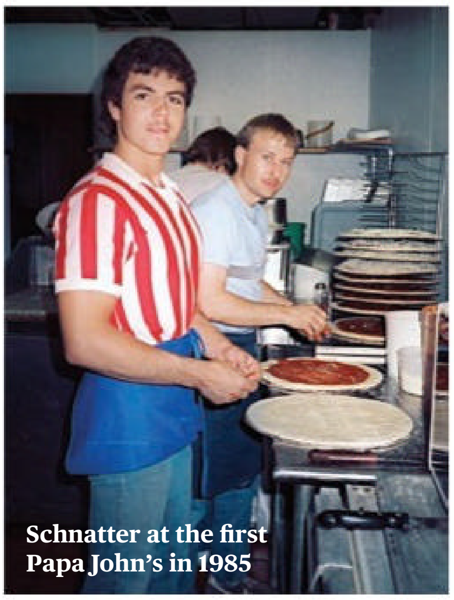
He heads out the front door to the driveway, where a crew is adjusting the height of one of three fountains that blaze with fire at night. Schnatter wants it lowered to improve the sightline, but it's proving tricky for the workers to satisfy his perfectionist tendencies. They're tearing up their latest effort so they can try again. "It's going to take them half a day," he says. "I've laid enough stone and enough drywall in my day to know. But it's got to be right."

He says he wanted to avoid building "an ostentatious four-story house," which is why much of his was built into a slope and can't be seen from the road. He has his project manager walk me around to the side, where we enter a tunnel designed

COURTESY JOHN SCHNATTER

to look like a centuries-old Italian streetscape. It leads to the subterranean garage where Schnatter parks his three vintage Chevrolet Camaro Z28s. There Schnatter reappears and leads me through a door back into the house. We head to his gym, a cavernous room decorated with wall-to-wall memorabilia documenting his rise as a pizza mogul, and to an old-timey movie theater where he watches football. Then we climb the circular staircase up to the foyer, the centerpiece of which is a 16-foot-tall sculpture of two eagles descending from the sky, mating. "It just speaks to me," he says, gazing up at it. "I think it's badass."

Schnatter says his attention to detail at home mirrors his quest for sublimity at Papa John's, which he started in 1984 in the back of Mick's Lounge, just across the state line in Jeffersonville, Ind. Within two years he'd opened four stores, and soon after he signed up his first franchisee. Malcolm Knapp, a veteran New York restaurant consultant, attributes the company's early success to Schnatter's charisma. "John was kind of a folk hero," Knapp says. "He started it all from a broom closet. He came up with the marketing slogan, 'Better ingredients. Better pizza.' He hammered that idea home." Schnatter would often pop into stores, high-fiving team members and checking to see if the pies were up to his standards. Whether the ingredients and pizza were really better or not, Papa John's grew until, in 1993, it went public with 254 stores.


Schnatter at the first Papa John's in 1985

The bigger the company became, the more its namesake found himself under attack. Schnatter traces the shift to a late '90s incident, in which the *Louisville Courier-Journal* reported on a woman's sexual harassment suit against him, including claims that he'd kissed and groped her. Schnatter denied the allegations and filed his own suit, accusing the woman of extorting him. They later reached a confidential settlement. "I was a hometown hero. Then somewhere between store 1,000 and store 2,000, I become a bad guy," he says. "Something happens where you get a certain size, and it just rubs people the wrong way."

The penchant he developed for mixing pizza with politics didn't help. During a corporate earnings call in 2012, Schnatter warned that if the Affordable Care Act wasn't repealed, it might increase pizza costs by as much as 14¢ a pie. Fox News anchors seized on Schnatter's warning as evidence of Obamacare's painful consequences, while liberal comedy show hosts roasted him. "When you order a Papa John's pizza, it's only after you've reached a state of such desperate gnawing hunger that you could eat the ass off a raccoon that drowned in your birdbath," said Stephen Colbert on *The Colbert Report*. "Now Obama expects you to shell out three extra nickels for this hot turd pie? Eat the nickels! You have your dignity!"

"The upper elite progressive left worries about me," Schnatter says of the reaction. He takes their disdain as a compliment. He got plenty more of it in 2017, when he went after the NFL over the anthem demonstrations. Early that season the league's ratings were down, and while there were multiple reasons for the decline, many conservatives were blaming it on players who were kneeling or performing other gestures to protest racism. Some of the NFL's major sponsors issued bland statements about the protests, saying they respected both the flag and the players' right to express themselves. Not Papa John's, which was spending $34 million annually to be the league's official pizza sponsor. On a Nov. 1 call with investors, Schnatter said, "The NFL has hurt us. And more importantly, by not resolving the current debacle to the players and owners' satisfaction, NFL leadership has hurt Papa John's shareholders."

Schnatter says he was shocked when news outlets reported that he'd criticized the protests. He recalls pleading with Papa John's PR firm at the time, Edelman, to clarify that he hadn't said anything about the players kneeling, even if he had seemed to trivialize their cause by failing to acknowledge its legitimacy. Edelman's advice, he recalls, was to keep quiet and let it blow over. "Y'all are in denial," Schnatter remembers replying. "I'm Papa John! This is not going to blow over."

Two weeks later the company tepidly apologized to anyone who found his remarks "divisive," which did little to stifle the controversy. By the end of the year, the company had announced that Schnatter was stepping down as CEO. Papa John's later said in legal papers that the response to his remarks was part of the reason, though Schnatter says the decision was part of a succession plan that had been in the works for a while. Edelman declined to comment.

Schnatter remained chairman. When Papa John's made new ads in which he didn't appear, he recalls, he directed some of his own at the company's expense. He says that they didn't elicit any negative response in the eight markets where they ran, and that by May 2018, Papa John's was ready to put him back on the air. At the time, the company was working with Laundry Service, an ad agency known for its work on behalf of Nike Inc. and Beats By Dre. Among the suggestions Laundry Service's then CEO, Jason Stein, had for Schnatter was for him to speak to selected journalists and clear up any misconceptions about his earnings call statement.

Toward the end of the month, Schnatter joined a conference call he says he thought was going to be a routine discussion about the ads he'd appear in next. He remembers being surprised when Stein instead presented him with a series of racially themed questions he might encounter in the chats. "One question you'll get in some form is 'John, are you racist?' " Stein told him, according to a transcript of the conversation that later became public.

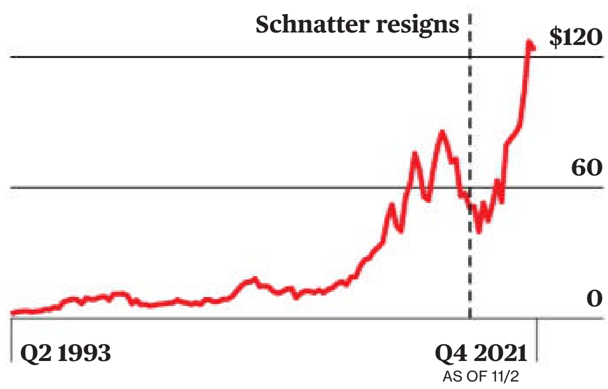
Stein told Schnatter they needed to craft some "very tight talking points" in preparation for such queries. "Right now their imaginations are running wild," Stein said. They "think that you're this right wing, extremist, neo-Nazi racist."

Schnatter says he feels as if Stein was trying to bait him into saying something that might subsequently embarrass him. ▶

◀ Running through Stein's questions, he expressed disbelief that anyone could accuse him of being a racist. Schnatter said he'd grown up at a time when "they used to drag Black people around behind a pickup truck until they were dead." He called NFL Commissioner Roger Goodell a "coward" and accused him of destroying players' bodies and minds. "They're all beating their wives up," Schnatter said. "They're all on steroids or pot, and now he's going to let them protest."

A Bigger Pie

Papa John's share price



DATA: COMPILED BY BLOOMBERG

Near the end of the call, Schnatter expressed his exasperation with the backlash against him. "What bothers me is Colonel Sanders called Blacks '[epithet],'" Schnatter said. "I'm like, I've never used that word." Switching to the royal we, he added, "Yet we use the word 'debacle,' and we get framed in the same genre. It's crazy."

Almost two months later, on July 11, *Forbes* reported that Schnatter had used the slur. The article described the circumstances of the call and said he'd been attributing the epithet to Sanders, but it didn't report the conversation in detail. Schnatter resigned as chairman the same day. Two days later, in an interview with a local radio station, he was contrite. "I can't talk like that, even if it's confidential and it's behind closed doors and they're trying to make sure that I don't do exactly what I did," he said. "I did it, and I own it, and I'm sorry. I'm sick about it, frankly."

The NFL had already parted ways with Papa John's; now the University of Louisville took the company's name off its football stadium. Major League Baseball suspended its "Papa Slam" promotion, which gave fans discounted pizza whenever a player socked a grand slam. And the grandchildren of Colonel Harland Sanders retorted that the Kentucky Fried Chicken founder had never used such vile language.

When I mention this to Schnatter, he replies, "I've got two Black heads of churches, heads of colleges that will come over right now and tell you that he used the word when he talked to their congregation."

"Tell him to produce the witnesses," says J. Trigg Adams, a descendant of Sanders. "I want to see if they will come into a court of law and swear they heard the Colonel use that word. I don't think he'll get anybody."

With Schnatter's name tarnished, it might have been a good moment for him to walk away. But he says he cared too much about his former company. In August 2018 he took out a full-page ad in the *Courier-Journal* to let employees know. "Dear fellow Papa John's team members, I miss you all very much," he wrote. "More than words can express!"

The more Schnatter dwelt on the events that led up to his departure, the more he saw an elaborate conspiracy. Take his remarks about the NFL. He'd made them at 10 a.m., and yet within a few hours they'd become a national story. Never mind that earnings calls are closely watched in the financial press—he suspected that someone at Papa John's might have tipped off the NFL about what he was likely to say, and that the league sounded the alarm with the press. That the league's spokesman then was Joe Lockhart, former White House press secretary under President Bill Clinton, only heightened his suspicions. (The NFL says Schnatter's claims aren't true. Lockhart says, "It's pure nonsense that there was a conspiracy to let him hang himself.") As for the Laundry Service call, Schnatter is convinced it was masterminded by people there and at Papa John's who wanted him gone. He notes that Casey Wasserman, whose company owns Laundry Service, is a Democratic Party contributor. Wasserman declined to comment.

That summer Schnatter sued Papa John's, seeking documents he hoped would reveal the truth. Eight months later he announced that he'd reached a resolution with the company, boasting in a press release that it entitled him to the materials he was seeking. Instead, Schnatter claims, Papa John's stiffed him. "They didn't turn over any records," he says. "They found a loophole to get around that." (A spokesman for Schnatter later says the company didn't provide any "meaningful documents.")

In late 2019, he filed a breach of contract suit against Laundry Service, accusing it of passing confidential information about the conference call to *Forbes*. It turned out the call had been taped, and a judge ordered it unsealed. Finally, in Schnatter's view, the public could see he'd used the word only to profess that he never used it. "What I said was antiracist," he says.

He was heartened to learn that someone at the agency had also left the recorder running after the call, capturing Stein's conversation with his employees. Several said they couldn't believe what they'd just heard. "Did he just use the N-word?" a woman asked. "He's a racist," Stein said.

Stein then said he wanted Schnatter "to go and speak the truth" to reporters. "Just have to make sure it's an hourlong conversation, so that he says shit like he said here," Stein added. "It's gonna come out. He can't control it."

Listening, Schnatter believed he'd found proof Stein had it in for him. He promoted the "hot mic moment" on his website, along with a transcript of the call. It's unclear what impact, if any, the tape will have on the case, which is still in the discovery phase before the U.S. District Court in Louisville. In court papers contesting Schnatter's accusations, Laundry Service's attorneys called his contention that the agency goaded him into using a noxious word "a lie" and said it was false that he was the victim of a setup. Laundry Service declined to comment for this story, as did Stein.

As the court fight progressed, Schnatter began speaking more freely with reporters, on the advice of a PR firm he'd hired, ProActive Communications, led by Mark Serrano, a former senior adviser to President Donald Trump's ▶

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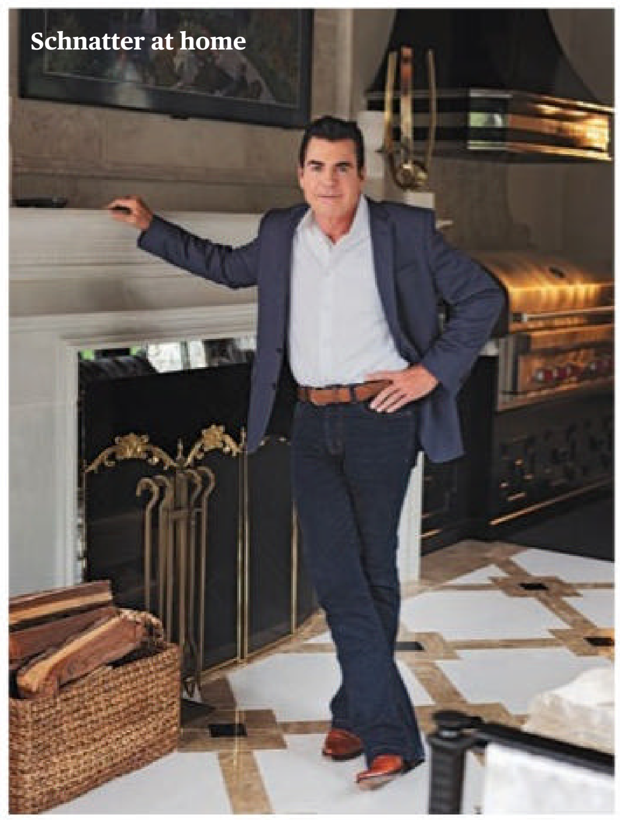
◀ reelection campaign. In interviews, Schnatter often touted an investigation he'd paid for by former FBI Director Louis Freeh, which sought to determine if there was evidence of racial bias in his NFL statement and the Laundry Service call. Freeh's report included praise for Schnatter from Kevin Cosby, president of Simmons College of Kentucky, an historically Black institution, and Samuel Tolbert, president of the National Baptist Convention of America. Schnatter's family foundation has donated or pledged a total of $1 million to Simmons and the convention. "The FBI investigation," as Schnatter often called it, fully exonerated him. Freeh declined to discuss the report. Cosby and Tolbert say Schnatter's donations didn't influence their statements. "I have tremendous respect for John," Cosby says.


Schnatter at home

Schnatter's remarks in the media occasionally went viral, if not necessarily for the reasons he intended. This March he told OANN one of his goals for the past 20 months had been "to get rid of this N-word in my vocabulary and dictionary and everything else," prompting his critics to wonder why he required so much time to refrain from using such an offensive term. He later issued a statement saying he meant he was trying to erase the word from the media's vocabulary in its "false and malicious" reporting about him.

Serrano also encouraged Schnatter to get busier on social media. Along with displaying his helicopter, he's used TikTok to make the case that the quality of Papa John's pies has deteriorated in his absence. He says he's tested 800 in the past 18 months. "Some were burnt," he says. "Some were undercooked." The main thing that's kept the company afloat, he claims, has been the food delivery boom caused by the pandemic. "It kind of makes me laugh at Rob Lynch," he says, referring to Papa John's CEO. "This guy is delusional. He has no idea how we built this company and the fundamentals. But he thinks it's him. He really thinks that he's done something magical."

The company had certainly had to do something after Schnatter's ignominious departure. With sales tumbling and stores closing in North America, in 2018 Papa John's waived millions of dollars in fees owed by franchises. The following year, Starboard Value, a New York hedge fund, invested $200 million in the chain in exchange for two board seats and significant influence over its direction. Schnatter filed paperwork saying he'd made a similar offer, only to be rebuffed.

With Starboard behind Papa John's, one of its first moves was to recruit former NBA star Shaquille O'Neal to be its first Black board member and its new brand ambassador. That August, the fund brought in Lynch, the former president of Arby's Restaurant Group Inc., to be CEO. Lynch was decidedly bland, but that might have been the point. He set about boosting employee morale and encouraging innovation, and by the second half of 2019, sales began to grow again. In 2020 and the first half of 2021, as the pandemic unfolded, U.S. quarterly same-store growth outpaced that of Domino's Pizza Inc. and Pizza Hut, the largest and second-largest publicly traded pizza chains, according to the research service Technomic. Peter Saleh, a restaurant industry analyst at BTIG LLC, attributes some of Papa John's recent success to the Epic Stuffed Crust Pizza it introduced last December. "I think it's fair to say it's the best product in their history," he says.

So while Schnatter is putting himself out there in the courts and the media, his old company appears to be doing fine. "Papa John's positive results over the past two years speak for themselves," a spokesperson said in a statement. "We are proud of the company we have become and the diverse, inclusive and innovative culture we are creating."

In other words, they've moved on.

On a Friday morning, around 11:30, there's already a healthy crowd inside Mick's Lounge. Schnatter enters and heads back to the broom closet. "Can we get a picture of you?" the cook calls out. "Can we put it on Facebook?"

"I would love it," Schnatter says. "Put it anywhere you want."

First he peeks at the room where it all started. The pizza oven is long gone, but still, Schnatter becomes wistful. "This was probably more fun than anything I ever did," he says. "We did 200 bucks on a Tuesday, and we were jumping up and down."

Once he's done reminiscing, he steps behind the bar and poses for a picture with the cook and the bartender. "It's time for a beer!" he proclaims. "Papa's buying. Happy hour. Let's rock!" The late-morning crew erupts with applause, and Schnatter's social media coordinator captures the moment.

Later on, Schnatter gives me a ride back to my hotel in his black Ford F-150 Raptor and talks again about the conspiracy against him. "As you dig in, you realize that, wow, the roots on this thing are wide, and they're deep," he says, crossing the Ohio River and heading into Louisville. "This may go all the way up the food chain to the powers that be in the progressive elite left."

What he wants from Papa John's, Schnatter says, is an apology and an admission that it mistreated him. "They know what they did," he says. "There's a whole lot of shredding and computers getting thrown away right now at Papa John's to make sure that if I do get back in, they don't leave a paper trail."

Get back in? Papa John wants to be reunited with Papa John's? It may not happen soon, Schnatter allows. But perhaps one day, the company will need him again. "You never want to say never." Ⓑ

GROOMING: LAUREN SUTTON


What are the stories that define climate change?

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PURSUITS

Photographs by Shirley Yu

Set and prop design by Limonata Creative

Forty-seven luxurious treats in a sumptuous range of hues to satisfy all the names on your list with baubles and bags and booze

By Kristen Shirley

November 8, 2021

Edited by Chris Rovzar

Businessweek.com

Headphones and cologne

Previous page:

1. RUBY EARRINGS
Showcasing expert craftsmanship, these hoops include more than 26 carats of invisibly set rubies. *Price on request; graff.com*

2. TANK MUST WATCH
One of Cartier's most buzzed-about timepieces of the year features a minimalist lacquered dial and matching strap. *$2,860; cartier.com*

3. MALLOW BLOSSOM BUBBLE BATH
An ideal stocking stuffer, this deeply hydrating bubble bath will soothe skin after a bitter winter day. *$14; susanne kaufmann.com*

4. BACCARAT ROUGE 540 EXTRAIT DE PARFUM
Maison Francis Kurkdjian's scent is now available in a limited-edition bottle that takes eight hours to craft by hand. *$1,250; neimanmarcus.com*

5. THERAGUN MINI
Not only does this massager jackhammer away at sore muscles, but a portion of the sales of the edition in red is donated to fight pandemics. *$199; therabody.com*

black as

1. MG20 WIRELESS GAMING HEADPHONES
The Xbox fan in your house will applaud the 22 hours of battery life and love the soft lambskin leather cups. *$449; masterdynamic.com*

2. BLACK OPIUM EAU DE PARFUM EXTREME
The classic scent of black coffee and dark patchouli gets a shimmering new bottle for this winter season. *$130; yslbeauty.com*

and some pearls

night...

3. H08 GRAPHENE WATCH
The first sporty watch from Hermès has a 39mm cushion-shaped case and an elegant, legible dial. The model shown is made with a graphene composite. *$5,500; 800 441-4488*

4. CORAVIN SPARKLING
Keep Champagne from going flat after opening with this clever device that keeps it fresh for four weeks. *$399; coravin.com*

5. PASSIONOIR TALISMAN GLIDE BRACELET
These black South Sea pearls range in shades from eggplant to charcoal, with rhodium-plated beads in between. *$5,100; mikimoto america.com*

6. XXX CHARCOAL
Energizing hints of saffron and pepper give this new scent a spicy profile. *$180; zegna.com*

A watch fit for kings

1. THE DALMORE 30-YEAR-OLD 2021 EDITION
Fans of single malt, rejoice! This liquid is aged in old bourbon barrels, then finished in 30-year-old tawny port pipes. *$5,500; thedalmore.com*

2. *CIPULLO: MAKING JEWELRY MODERN*
This coffee-table book shines a light on Renato Cipullo, the designer behind Cartier's most beloved pieces. *$195; assouline.com*

3. PEN OF THE YEAR 2021
Inspired by medieval knights, this limited-edition fountain pen has a Damascus steel barrel. *$5,200; graf-von-faber-castell.us*

4. FIFTYSIX COMPLETE CALENDAR
So accurate, its lovely moonphase needs to be adjusted only once every 122 years. *$40,500; vacheron-constantin.com*

5. CUB WINDER WITH COVER
Watches stay on time with this winder, which makes 900 turns a day. *$305; wolf1834.com*

1. DIVAS' DREAM JEWELRY WATCH
The fan motif on the dial, set with pink sapphires and diamonds, pays homage to the tile of Rome's Baths of Caracalla. *$158,000; bulgari.com*

2. LES EXTRAITS DANCING BLOSSOMS
Architect Frank Gehry designed the cap on this fragrance, which showcases jasmine, tuberose, and apricot. *$530; louisvuitton.com*

and some sparkling delight ...

3. COPACABANA EARRINGS
Clusters of 90 carats of ombré sapphire beads glint from every angle. *Price on request; chopard.com*

4. COSMOPOLITAN CANDLE
The ultimate '90s cocktail is back—as a sweet scent from Dante, one of New York's top bars. *$40; dante-nyc.com*

5. & 6. LIP STAIN AND PLUMPER
This vegan lipstick is hydrating; the plumper features cayenne pepper and mint extract. *$31 and $34; deardahlia.com*

A formula to ma

1. CRISTAL 2013 CHAMPAGNE
Louis Roederer calls 2013 a classic vintage; it's fresh with notes of ripe citrus and hazelnut. *$295; millesima.com*

2. LARGE BONE CUFF
The late Elsa Peretti designed this cuff in the early '70s, but it's just as avant-garde today. *$28,000; tiffany.com*

3. PURE GOLD RADIANCE CONCENTRATE
The brushed-gold case contains a replaceable glass vial filled with gold-infused serum to even skin tone and texture. *$850; laprairie.com*

4. FLAME EARRINGS
Brazilian designer Fernando Jorge re-creates the power and beauty of flickering fire in rich gold bands. *$14,900; fernandojorge.co.uk*

5. TWENTY~4 AUTOMATIC 7300/1200R-001
An exquisite rose-gold case is offset by a rich brown dial and a bezel set with 160 diamonds. *$48,500; patek.com*

ke your skin feel just right!

A necklace with carats and carats of bling

1. PURPLE YAM MILLE CRÊPES CAKE
Every element in this photogenic dessert, from its delicate crêpes to its sugary crumbles, uses sweet purple yam. *$95; ladym.com*

2. LUISA BECCARIA CAKE STAND
With an iridescent finish and fluted base, this pedestal might just outshine whatever treat sits on top of it. *$280; artemest.com*

3. MINI ANTIGONA VERTICAL BAG
Supple calf leather complements a sturdy, removable chain-link strap. *$1,650; givenchy.com*

4. WATERBURY SMALL TUMBLER
The double-gathered design—inspired by rivers near Waterbury, Vt.—creates a subtle optical illusion. *$70; simonpearce.com*

5. SCAPEGRACE BLACK
This unusual New Zealand gin starts out with a black tint that turns mauve when mixed with tonic or citrus. *$47; shop.scapegrace distillery.com*

6. VIOLET PLUM JAM JAR
Topped with sterling silver, this jam jar is the most elegant part of breakfast. *$2,850; us.buccellati.com*

7. CLUSTER NECKLACE
A platinum stunner, it's set with sapphires—including a 27.77-carat stone at the center—and overlapping diamonds.
Price on request; harrywinston.com

A truly green watch and a mind-blowing ring ...

1. LITO VIDE POCHE
A porcelain tray trimmed with 24-karat gold plating is a fitting spot to drop new jewels. *$250; l-objet.com*

2. LES MAINS HERMÈS NAIL ENAMEL
At your fingertips: a long-lasting nail enamel in a Pierre Hardy-designed bottle. *$45; hermes.com*

3. PROMISE RING
A gorgeous 13.63-carat emerald flanked by two diamonds will add stunning pomp to your proposal. *Price on request; graff.com*

4. PIX BALLPOINT PEN
The smooth rollerball system, resin barrel, and platinum clip give handwriting some additional polish. *$245; montblanc.com*

5. LUMINOR MARINA ESTEEL
It looks like a classic Luminor, but most of the components are recycled, including the case and the dial. *$8,700; panerai.com*

1. MATRICE VASE
The rich royal blue of this hand-cut, mouth-blown Saint-Louis crystal vase makes a decor statement with or without a bouquet. *$6,650; gearys.com*

2. HERITAGE BRACELET
Cabochon-cut sapphires and turquoise are interspersed with sparkling diamonds. *$216,000; vancleefarpels.com*

3. FLAMENCO CLUTCH
Sure, it resembles your favorite Muppet—but the goat shearling material lands on the cool side of cutesy. *$2,600; loewe.com*

4. INVENTUM CANDLE
The rose fragrance is almost overshadowed by its opulent Murano glass vessel and engraved knob. *$325; gucci.com*

5. PANGAIA LAB x TWELVE SUNGLASSES
Mirrored polycarbonate lenses made from captured carbon dioxide make a statement for chic sustainability. *$495; thepangaia.com*

6. LUTARA MULES
Manolo Blahnik's 3½-inch heels—in blue silk with a crystal strap—turn any occasion into a festive one, no matter the guest list. *$1,195; 212 255-2600*

7. SORELLINA X TROVE TAROT JEWELRY BOX
This lacquered treasure box is adorned with motifs that nod to the stars. *$1,228; trove.store*

8. CARO MICRO BAG
At just 1½-inch thick, it will hold the necessities: lipstick and AirPods. *$2,550; dior.com*

A bag with some style à la Sesame Street

and festive high heels for your fabulous feet!

China Tries to Tame Its Tiger Parents

By Shuli Ren

Not every child is Harvard material. That's the message China is sending to its supercompetitive tiger parents after calling a stop to after-school tutoring in July.

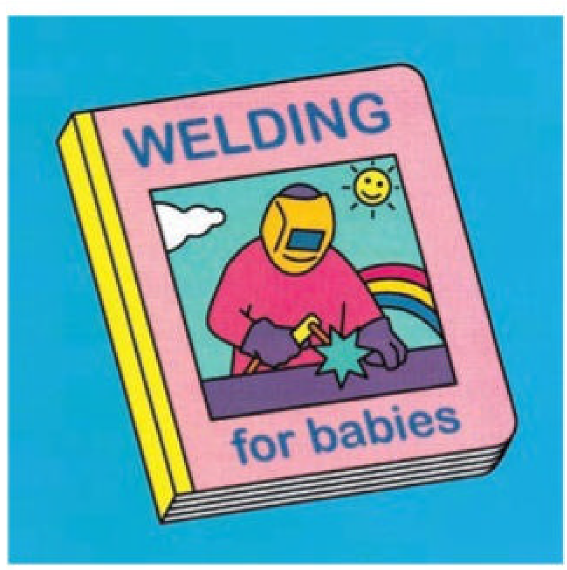

ILLUSTRATION BY GEORGE WYLESOL

China is embracing what might be called the German model. Instead of going into academic institutions, many young Germans enter a "dual training" apprenticeship, splitting their time between classrooms at a vocational school and on-the-job training at a company. This is a great way for them to get good jobs. About 80% of Germany's large enterprises participate in dual training.

On Oct. 12, the State Council, China's ultimate governing body, issued a new guideline pushing for something similar. By 2035, the government vowed, the nation will have built a world-class vocational education system to develop highly skilled workers, with at least 10% of the entering class working toward a bachelor's degree.

China no longer wants so many young university graduates without practical skills—a group that has become a source of unemployment and social discontent. Last year, close to 10 million students enrolled in undergraduate programs, up 46% from a decade earlier. Last June, when the class of 2020 graduated, the unemployment rate for degree holders aged 20 to 24 was 19.3%, vs. the economy's overall 5%, according to HSBC Holdings Plc.

There are plenty of jobs, especially in the high-end manufacturing sector. But out of personal and family expectations, few fresh graduates want to go work in factories and build electric vehicle parts. Instead, most want to go into consumer tech, media, or financial services.

As a result, the world's biggest factory is losing its edge. Last year, value added from manufacturing accounted for only 26% of China's gross domestic product, a 6 percentage point drop from just a decade earlier. By comparison, it took Germany three decades to hit a decline of this scale.

Chinese society can be surprisingly rigid. Schools informally classify children as "golden babies," "silver babies," and "copper babies"—usually based on where they're born and their parents' wealth. China has enough golden babies, or those who can make it to Tsinghua University and will develop world-class semiconductor chips one day. It has plenty of copper babies, who work in construction and factories making low-end exports such as clothes and toys. But it lacks silver babies, who can manufacture the high-value tech gear that golden babies design.

The question is whether China's tiger parents will let their babies do vocational training. In big cities, some parents wouldn't even allow their daughters to marry someone without a bachelor's degree. And if the daughter has a master's, good luck to her—she'll have to marry a Ph.D. So it's likely that Beijing will have to put incentives in place—such as free tuition at vocational schools, along with pay for on-the-job training—to get its tiger parents to accept the idea. B —*Ren is a columnist for Bloomberg Opinion*

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