● The Covid data heroes 32 ● Santa's pandemic plan 14 ● More Lysol is never enough 56

Bloomberg Businessweek

November 23, 2020 ● SPECIAL DOUBLE ISSUE

Year of the Pet

They (and their humans) have turned Chewy into a lockdown-era retail powerhouse 44

Photographed responsibly by Pablo with a tripod

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◀ Unfilled cans of Lysol's new Neutra Air 2 in 1, a combination germ killer and air freshener

PHOTOGRAPH BY CHRIS MAGGIO FOR BLOOMBERG BUSINESSWEEK

FEATURES

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■ COVER TRAIL

How the cover gets made

❶

"So Trump hasn't conceded and Covid is a raging wildfire, but I think we should do a cover story about the online pet retailer Chewy—"

[Dog barks in the background]

"He barks whenever I say 'Chewy.'"
[Dog barks again]
"Is that a Bengal I see in your lap?"

[Loud sound of purring over video chat]

"My Smooshie Wooshie gets all her organic cat litter and exotic animal food delivered from Chewy. Don't you, Smooshie? Yes, you do!"

[Continuous dog barking]

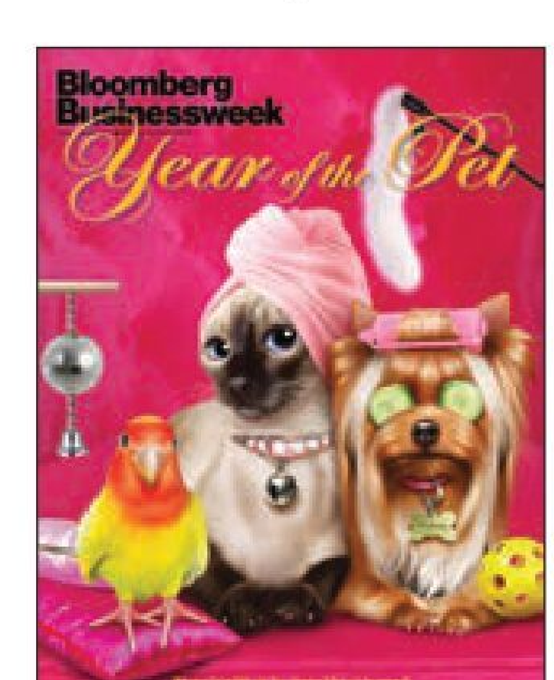
"Ah, yes, we're big fans of the free-range organic chicken liver treats from... well, you know where."

[Even louder purring]

"There's this wall-mounted cat fort we're eyeing—only $350, too. Isn't that right, Smooshie? You love your Chewy!"

[More barking, then the sound of a lamp crashing to the floor]

"I'm starting to see why this is such a good business model..."



Cover: Illustration by Arno

SANTA: PHOTOGRAPH BY TAG CHRISTOF FOR BLOOMBERG BUSINESSWEEK

IN BRIEF

By Benedikt Kammel

● Globally, 56 million people have tested positive for the coronavirus, and more than

1.3m

have died. A particularly explosive resurgence in the U.S.—which has recorded 1 million new cases since the beginning of November—is forcing many states to tighten curbs.

● BioNTech and Pfizer are seeking emergency FDA authorization for their vaccine.

Final results from late-stage trials reported on Nov. 18 suggest the Covid-19 shot is 95% effective. On Nov. 16, Moderna released preliminary results from the late-stage clinical trials of its vaccine—which would be easier to distribute—showing 94.5% efficacy.

● In the first commercial crew transport in NASA's history, a SpaceX Dragon capsule carrying four astronauts docked at the International Space Station on Nov. 16. The scientists are on a six-month mission aboard the orbiting lab.

● "Unless there is some basis for some cooperative action, the world will slide into a catastrophe comparable to World War I."

Former U.S. Secretary of State Henry Kissinger, who laid the groundwork for Richard Nixon's historic 1972 trip to China, urged President-elect Biden to repair ties with the country that were badly frayed during the Trump administration.

● Oil giant Saudi Aramco kicked off a jumbo bond sale on Nov. 17 to help fund a

$75b

dividend. The payout will go almost entirely to the Saudi Arabian government, which needs the money to plug a budget deficit and prop up the economy.

● The U.S. FAA cleared Boeing's 737 Max to return to the skies with a package of fixes.

The 20-month grounding of the company's bestselling model followed two fatal crashes. European regulators have already signaled they see the plane as fit to reenter service; Chinese authorities, who were among the first to withdraw the Max's operating license, have yet to give their blessing.

● S&P Dow Jones will include Tesla in the S&P 500 in December. Elon Musk's EV pioneer, valued at more than

$390b

would be the largest company ever added to the index.

● Airbnb filed for a December IPO that could be among the biggest this year.

Bookings for the home-sharing company tumbled 40%, to $18 billion, in the first nine months of 2020, as pandemic restrictions curbed travel. But Airbnb projected a rebound when the economy recovers.

● Companies announced deals worth more than $30 billion on Nov. 15 and 16.

PNC agreed to buy BBVA's U.S. banking operations for

$11.6b

Italian payments processor Nexi will acquire Danish rival Nets AS for

$9.2b

Home Depot will reunite with distributor HD Supply, in a deal valued at about

$8.7b

Endeavour Mining plans to buy Teranga Gold for about

$1.9b

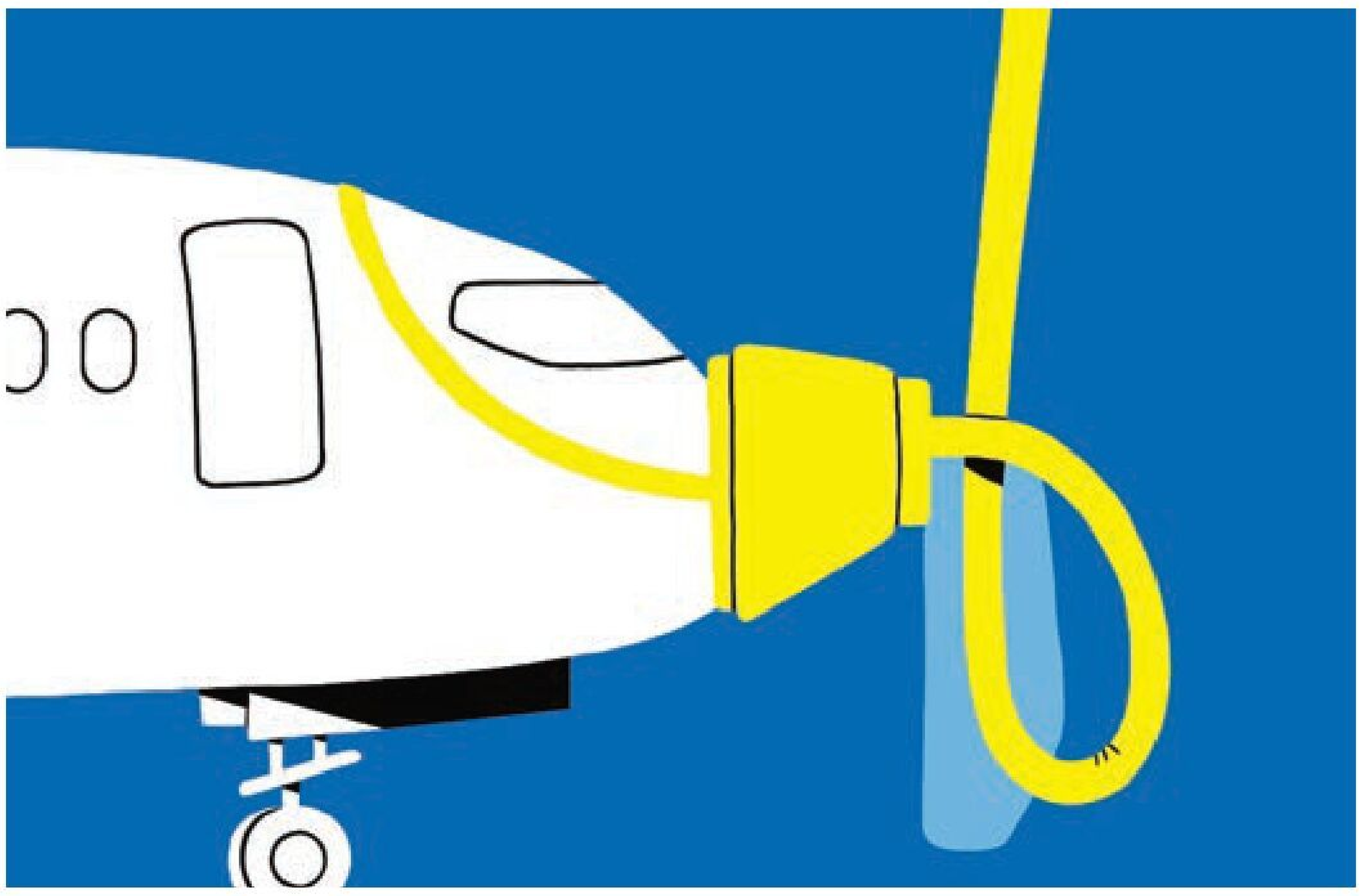
NASA: NASA TV. SHELTON: SARAH SILBIGER/GETTY IMAGES. KISSINGER: TAKAAKI IWABU/BLOOMBERG

● This year's record-breaking hurricane season continued unabated, with Iota, the 30th named tropical storm, making landfall on Nov. 16 in Nicaragua.

● On Nov. 17, Judy Shelton failed to garner enough

votes in the U.S. Senate to be confirmed to the Federal Reserve Board. Majority Leader Mitch McConnell may try to schedule a second vote on the controversial nominee.

■ AGENDA



▶ A Grounded Industry

The world's airlines and plane makers gather virtually on Nov. 24 for the annual general meeting of the International Air Transport Association. They will discuss strategies to help the industry recover from its worst-ever slump. ▷ 16

▶ U.S. retailers are preparing for Black Friday's annual holiday shopping rush, on Nov. 27, though tighter pandemic restrictions may keep many consumers out of stores.

▶ The Institute of International Finance holds its emerging-markets central-banking conference via livestream on Nov. 23-24 to discuss the future of monetary policy.

▶ Germany's Ifo Institute releases its monthly survey of business sentiment on Nov. 24. It's one of the most closely watched economic indicators in Europe's largest economy.

▶ Minutes from the U.S. Federal Open Market Committee's Nov. 4-5 meeting will be released on Nov. 25. At its last gathering, the Fed kept borrowing costs at close to zero.

▶ In the week starting Nov. 23, U.K. and EU negotiators hope to reach a deal on what trade and commerce will look like after the Brexit transition ends on Dec. 31, 2020.

▶ Former heavyweight boxing champion Mike Tyson, 54, faces off against Roy Jones Jr., 51, in a comeback match at the Staples Center in Los Angeles on Nov. 28.

ILLUSTRATION BY SAMANTHA SLINN

■ BLOOMBERG OPINION

Cities Still Need Their Pandemic Lifeline From the Fed

America's state and local governments face a difficult winter. Already under severe financial pressure, they'll see their resources stretched further still by a resurgent pandemic. Congress needs to give them new fiscal aid now, but whether that will happen is in doubt. Given these uncertainties, this is no time to remove their one reliable lifeline: the Federal Reserve's highly successful program to ensure they can borrow what they need.

The Fed and the Treasury introduced the Municipal Liquidity Facility amid the Covid-induced mayhem of March and April—when markets froze and borrowing costs more than doubled for even the most highly rated cities. To restore calm, the central bank pledged to buy debt securities directly, at a closer-to-normal yield, from any creditworthy issuer that couldn't raise money from private investors.

It worked. Simply by being in place, the backstop revived the market. It brought yields below pre-pandemic levels, and only two issuers (Illinois and New York's Metropolitan Transportation Authority) had to tap it, using less than $1.7 billion of the $500 billion available. It's hard to imagine a more effective use of taxpayer resources.

Just one problem: The program expires on Dec. 31, and Republican legislators and the Treasury oppose an extension. This wouldn't be so serious if the coronavirus crisis were ebbing and the economy were on a glide path to recovery. They're not. Cases and hospitalizations are on the rise, threatening renewed social distancing measures and a slower expansion (or worse). This will reduce municipal tax revenue again—and it's already projected to come up hundreds of billions of dollars short. Layoffs and service cuts are looming. With Republicans likely to retain control of the Senate, it's unclear when, if ever, legislators will support a new relief package.

Borrowing is no substitute for fiscal support. But the backstop is crucial to help municipalities weather these stresses. It should remain in place until officials are certain it's no longer needed, as happened with emergency lending facilities after the 2008 financial crisis. The Fed should also consider expanding access—for example, by lowering the population threshold from 250,000, so smaller cities can benefit.

Judging by the lack of jitters in municipal bond markets, investors are assuming that common sense will prevail. It's to be hoped they're right. The Trump administration should extend the facility immediately and, if it fails to do so, President-elect Biden should pledge to set things straight after he takes office on Jan. 20. The finances of cities and states across the country depend on it. Ⓑ *For more commentary, go to bloomberg.com/opinion*

SPONSOR CONTENT

QCT and Rakuten Mobile
Disrupt the Telecom Industry

QCT SERVERS WORKING BEHIND THE SCENES OF THE DISRUPTIVE RAKUTEN MOBILE NETWORK

Rakuten Mobile's World's First Fully Virtualized Network

- Redefined how mobile telco networks are designed, built, operated
- Significant reduction in CAPEX and OPEX due to virtualization, automation and open architecture

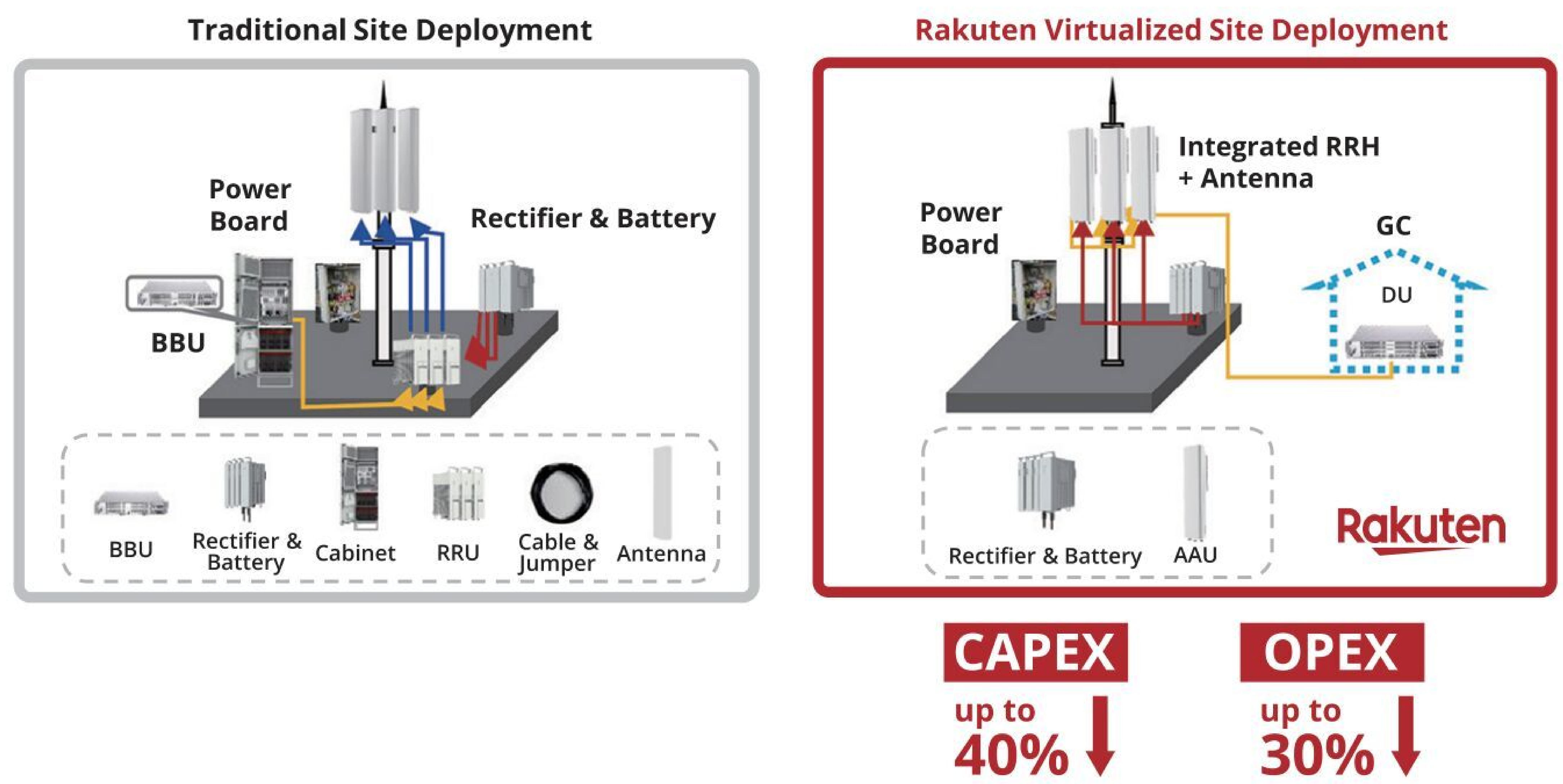


Fig.1. Rakuten Mobile's world's first fully virtualized mobile network

At Mobile World Congress Barcelona 2019, Rakuten, alongside hardware and software tech giants including Intel and QCT, announced its plans to enter the telecom space.

Rakuten is one of Japan's leading internet services companies, operating businesses in a wide range of fields, including e-commerce, fintech, digital content and communications, with over 100 million members in Japan. Rakuten Mobile, a Rakuten Group company responsible for mobile communications, has built the world's first fully virtualized cloud-native mobile network. Together with its industry-leading partners, Rakuten Mobile has developed a fully virtualized, software-centric and automated network architecture that is also 5G-ready. This approach disrupts what the telco industry has been doing traditionally, offering dramatic CAPEX and OPEX savings and enabling more automated and agile network services.

"Rakuten Mobile has built the world's first end-to-end cloud-native architecture," said Tareq Amin, Rakuten Mobile's Chief Technology Officer. "That means every function in the network has been completely virtualized, including the complex functions such as radio access. When you move your workloads to the cloud, significant efficiencies can be realized. These efficiencies translate to cost reduction in both CAPEX and OPEX, which can be passed on to the consumer. Such networks also allow for significant agility, making it possible for us to roll out innovative services to our customers at a much faster pace than others using legacy networks."

Rakuten Mobile also plans to offer its platform to operators globally with its Rakuten Communications Platform (RCP) to enable telcos to adopt new-generation networks based on an end-to-end cloud platform. Operating Companies (OPCOS) will benefit from RCP-validated design, cost efficiencies, agility, security, and openness to generate incremental revenue streams and introduce differentiated services to their clients.

Behind the curtain, QCT plays a critical role as a 5G ecosystem enabler, working with some of the world's largest cloud service providers (CSPs) and acquiring vast experiences, capabilities, and expertise that triggered Rakuten Mobile's interest and motivation to partner with QCT. Along with leading semiconductor chip manufacturer Intel, together they are driving fundamental changes in the way mobile telecommunication companies plan, deploy, and manage their infrastructure utilizing Intel® Xeon® Scalable processors and Intel® field programmable gate array (FPGA)-based accelerators in an underlying foundation that not only scales but also enables continued innovation to create services on the agile Rakuten Mobile network.

These companies are also expediting the network transformation journey by working with open communities in the telecom space (i.e. Open RAN Policy Coalition and the Telecom Infra Project) in order to democratize 5G technologies.

"QCT sees a natural progression of cloud computing technologies from CSPs to Telcos, and this Rakuten Mobile project further validates this trend," said Mike Yang, President of QCT. "With our expertise and experience in data center hardware technology, we have expedited the network transformation journey in the realization of a fully virtualized 4G LTE network that can be extended to 5G."

For more information on QCT 5G solutions visit: *https://go.qct.io/telco/*

Fear and Frenzy in Hong Kong

● A Chinese crackdown hasn't curbed the hunger for investing

● By Sheridan Prasso

Hong Kong people love to stir-fry. Not just food–it's the Chinese term for investing in stocks. And about 1 in 5 residents were ready to fry up a piece of the initial public offering of Ant Group Co., Jack Ma's fintech company, before its early November listing was scuttled at the last minute by Chinese regulators. It was a crushing blow to what was expected to be the biggest IPO ever. But within days, investors were eyeing other listings on the menu.

While it may not be apparent from the headlines about China's crackdown on dissent in Hong Kong, there's been an easy-money frenzy of late. On Nov. 11, the same day opposition lawmakers resigned en masse to protest the disqualification of four of them for insufficient loyalty to China, Bright Future Technology Holdings Ltd., a Shenzhen-based mobile advertising company, debuted on the Hong Kong exchange. Its shares popped 32%. And more IPOs are on the way, enough that listings are still on track to beat last year's $40 billion total, even without the Hong Kong portion of the Ant offering, which has been postponed at least until next year.

"Investors remain eager for upcoming good IPOs," says Steven Leung, a Hong Kong-based executive director at UOB Kay Hian, pointing to Chinese companies looking to raise $1 billion or more in the coming weeks, including JD Healthcare Ltd. and consumer-products maker Blue Moon Group Holdings Ltd. Kuaishou Technology, ByteDance Ltd.'s smaller rival, filed for a $5 billion listing days after Ant's was killed. "The IPO market will continue to be hot toward yearend."

To live in Hong Kong these days is to attempt to reconcile two worlds–a hot Hong Kong where a government-fueled boom has bankers working overtime, and a chilled one for free expression following the imposition of China's national security law in June. As the power of China and its grip on Hong Kong grow stronger, the city is being forced to accept a seemingly inevitable fate: becoming an increasingly Chinese city under Chinese laws, a gateway for its billions in capital flows, while simmering with discontent and crushed hopes. "There's a real disconnect between the business world and the local world, but all of us in Hong Kong are getting used to living with fear to various degrees in a way we haven't before," says Antony Dapiran, a lawyer and author of two books on the city's protest movements.

Hong Kong isn't the only place where stock markets are disconnected from the real economy, but with so many Chinese companies looking to go public and with others that debuted in New York seeking secondary listings in the city, it's been a busy year for bankers. During a recent Friday happy hour, one of them who works at a bank that's sponsored several offerings says he doesn't have time for a drink–just a quick tea. He needs to get back to his desk, he explains, where he plans to work until midnight, maybe 1 a.m., the usual these days. His bank set an internal record for trades executed in a single day this year, and the volume has kept everyone hopping, he says, giving his name as Daidai so his employer can't identify him, as he's not authorized to speak. "It was always very busy, but now it's at a higher level," he says.

ILLUSTRAITON BY MATTHEW KAM

Yet just when sleep-deprived bankers are heading home for the night, 24-year-old Joshua Wong will go to bed wondering if he'll be awakened in the morning by police coming to arrest him. "The worst time might be midnight, before you sleep," says Wong, a pro-democracy activist who's done three stints in prison, over a lunch of steamed fish and double-boiled mushroom and pork soup. "The best way to overcome the fear is not to think about it every day. It's better to think about how to continue the fight."

None of the underlying reasons for last year's outpouring of almost 2 million protesters has been resolved. Rather than move toward democracy, as protesters demanded, Hong Kong has gone in the opposite direction: legislative Council elections postponed for a year, pro-democracy candidates disqualified, and moderate lawmakers ousted for not being patriotic enough.

What's going on in the markets makes for jarring juxtapositions with what's going on in the streets. The September debut of Chinese bottled water company Nongfu Spring Co. was oversubscribed 1,100 times by retail investors, making it the most popular Hong Kong IPO of the past decade. Yet the opening bell rang just 36 hours after police charged into a crowd of protesting teenagers and arrested 300 people. Two days before Ant filed for its IPO in August, 12 activists fleeing Hong Kong by boat for Taiwan were captured by China's coast guard and imprisoned on the mainland. On a day in early November, when demand outstripped supply four times over for $5 billion worth of inflation-linked bonds, police launched a hotline urging citizens to report one another for violations of the national security law. What critics have been calling a "snitch line" drew 1,000 tips in the first few hours.

The fear is as palpable as the finance frenzy. Beijing's representative in Hong Kong, Luo Huining, announced on the eve of China's Oct. 1 National Day that Hong Kongers must now love China out of "obligation," not choice—which some on social media likened to a permutation of an old saying: "The beatings will continue until morale improves." Thousands of riot police posted on Hong Kong's streets that ▶

◀ day threatened to stop anyone daring to show otherwise. Carrying banners, possessing stickers, or shouting slogans previously used by protesters all now violate the new law, and 28 people have been arrested. Hong Kong's government and Beijing's emissaries have repeatedly said that the law would affect only a small group of radicals and that the city's freedoms would be preserved.

Some in Hong Kong's financial industry, like Alvin Fan, chief executive officer of hedge fund platform OP Investment Management, say the national security law has been a boon, allowing the city to get back to the business of making money. His firm is having a record-breaking year for raising assets, and the actively managed hedge funds on his platform are up 16%. "Not only financial stability but just stability is really important," says Fan, whose biggest concern is that headlines about crackdowns will continue to raise fears abroad and deter cash flows. "Investors vote with their dollars at the end of the day."

David Webb, an activist investor with longtime involvement in the Hong Kong market, says China is willing to bear the considerable costs to its international standing as a result of its "full iron fist" approach to Hong Kong. That's because it will help China absorb the city into its plan for the Greater Bay Area, which aims to create a tech hub rivaling the San Francisco Bay Area, he says. Hong Kong residents who take up a U.K. offer of residency will simply be replaced by mainland Chinese. "They'd rather turn Hong Kong into another province of the mainland, because the higher priority is not having the protests and not destabilizing the city," Webb says.

Even if large-scale protests could take place, the media's ability to cover them has been curtailed. New police guidelines don't recognize freelancers, student journalists, and online news reporters, many of whom had taken the biggest risks to chronicle last year's unrest. Those deemed credible must self-censor or face pressure from management, according to the Hong Kong Journalists Association. Before an August raid on the headquarters of opposition newspaper *Apple Daily* and the arrest of its founder, Jimmy Lai, on suspicion of violating the national security law, Hong Kong had dropped to 80th place on the Reporters Without Borders annual press freedom index, from 48th in 2009.

Public rebukes of Hong Kong professionals appear almost daily. Pro-China newspapers attack judges deemed too lenient in the cases against almost 10,000 protesters arrested since mid-2019. After an elementary school teacher was banned from the profession for life in September for teaching a lesson before the new security law went into effect on why some people were calling for independence, a former chief executive of the city posted on Facebook the personal information of 18 other educators facing protest-related charges. He said parents deserve to know who is seeking to radicalize their children and urged them to report other teachers. China's Liaison Office in Hong Kong has urged cutting off the "black hands" in the school system. Many teachers now fear classroom discussions could result in children reporting them to parents, ending their careers. Meanwhile, books advocating democracy, including those by activist Wong, have been pulled from the shelves of school and public libraries.

The increasing use of Communist Party vernacular, public shaming, and encouragement of citizens to report on others, while not as extreme as what happened during China's Cultural Revolution, is alien to most Hong Kong residents and is altering the fabric of society. "It makes the pro-democracy individuals fearful, leads some to flee, and strikes fear in the rest of the community," says Maya Wang, a senior researcher for Human Rights Watch. "Beijing is perhaps trying to replicate in Hong Kong an important mechanism of social control in China: a culture of informants. Authoritarian governments rarely go at it alone—they rely on the power of the masses."

For now, the two Hong Kongs coexist. Foreign companies and international banks aren't fleeing, and the opportunities for making money aren't vanishing. That's not likely to change, regardless of what form Hong Kong's government takes, not as long as China's currency controls make the city a place for mainland companies to raise capital on a stock exchange where they constitute two-thirds of the market cap. A recent change to allow listings of dual-class shares has made the city even more attractive to Chinese companies at a time when anti-China rhetoric in the U.S. has prompted some to seek secondary listings in Hong Kong. And U.S. sanctions and revocation of Hong Kong's trade privileges have done little to damp sentiment. China's bet that it could maintain Hong Kong as an international finance center while cracking down on dissent appears to be paying off. "This remains a foreign currency ATM for Chinese companies," says Dapiran.

It's not all rosy for China in Hong Kong's financial markets. Several offerings didn't immediately catch on with investors, including Yum China Holdings Inc., which operates KFC restaurants in China. Its secondary listing in Hong Kong in September fell 6% before recovering to its offering price a month later. The postponing of the Ant IPO left bankers missing out, at least for now, on an anticipated $400 million in fees. Some brokerages are sharing the cost of margin loans with their investors, though they say all the money pledged for shares is being returned.

Hong Kong's real economy remains in recession, contracting 9% in the first half and 3.5% in the third quarter. That's a recipe for discontent. It's also a reason many Hong Kongers want to continue the fight—to at least keep officials aware that people need government to work for their benefit, not only for the developers, tycoons, and Beijing-connected elites who control the city's economy and political structures.

Holding them accountable is the role of activists, says Wong, who spends his days taking on causes such as a campaign to free the activists caught fleeing to Taiwan and raising global awareness about Hong Kong's diminished freedoms. "What we are trying to do is keep up the momentum," he says. For investors, or anyone who might think Hong Kong is content with the surging IPO market and its ability to mint billions, Wong has a message: "We will never give up." Ⓑ

—*With assistance by Julia Fioretti and Gregor Stuart Hunter*

Santa Has a Pandemic Plan

● Thanks to Covid, kids are trading Santa's lap for video chats and plexiglass shields

The coronavirus has upended many aspects of life, dramatically changing how people work, study, and even worship. Now it's primed to wreak havoc on another pillar of modern existence: Santa Claus. Macy's Inc., the iconic department-store chain whose 34th Street flagship in Manhattan is the setting for the most famous Santa movie ever, has announced that the jolly old elf won't be visiting because of the pandemic. And while Santas in many malls across the U.S. haven't gotten the boot, their traditional faux North Pole backdrops near the food court are going to look a lot different this year, when many of their brethren will be checking their nice and naughty lists online.

Children at the Park Meadows mall in Denver will be able to greet a masked Santa sitting safely on his sleigh 6 feet away, and families at Orlando's Altamonte shopping center will share their wish lists from the bottom of a mountain of gifts with a socially distanced St. Nick perched on top. At the SoNo Collection, an upscale mall in Norwalk, Conn., a masked Santa will be behind a plexiglass shield shaped like a snow globe, giving the illusion that he's trapped inside, safe from the kids chatting him up from the other side.

They're all ways mall developer Brookfield Property Partners LP has devised to protect the seasonal performers—who are often older and plumper, putting them at higher risk of Covid complications—while also driving the holiday foot traffic that's so critical to retailers' bottom lines.

This holiday season, just 45% of U.S. consumers plan to go to a shopping mall, down from 64% who visited last November and December, according to an International Council of Shopping Centers survey. Having no Santa to draw families

Edited by James E. Ellis

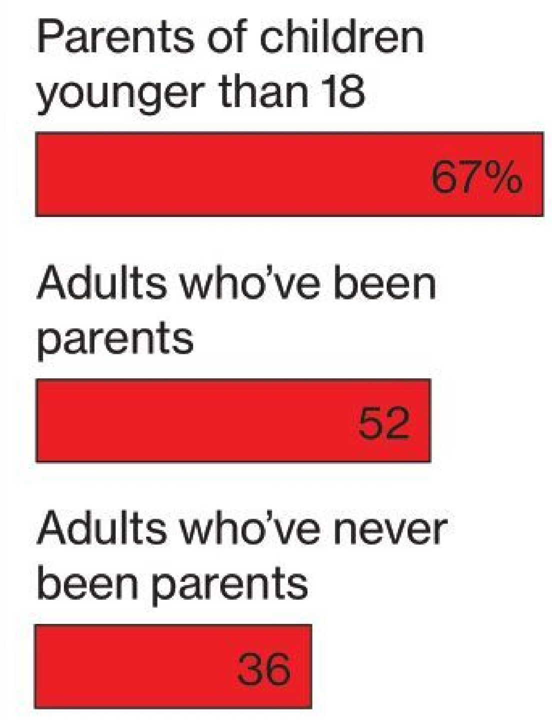
would be the latest blow to retailers, dozens of which have filed for bankruptcy in the past year, from J.C. Penney Co. to J.Crew Group Inc.

Brookfield normally gets about 350,000 visits to Santa at the 134 shopping centers where it typically hosts St. Nick. The company declined to say how many Santa visits it expects during this Covid-slammed season. "Holiday time and getting people into our centers for shopping and visits with Santa is very important for us," says Rocell Viniard, director of marketing at Brookfield. While they're there, they also shop and eat, which can add up to big bucks.

Kimco Realty Corp., owner of open-air shopping centers across the U.S., isn't giving up on Santa, either. Many of its locations will offer socially distanced pictures with him in tented areas outdoors. At some of those Kimco properties, such as Suburban Square in Ardmore, Pa., Santa will be making toys behind a table as guests come greet him, ensuring there's plenty of space between them.

For Santa fans who don't feel safe venturing to the mall, there will be plenty of options. Brookfield is offering personalized virtual visits, starting at ▶

▼ Share of U.S. adults who say Santa is an important part of their holiday celebrations*



◀ Santa Ric Erwin, in Hemet, Calif., spreads some Zoom-mas cheer

PHOTOGRAPH BY TAG CHRISTOF FOR BLOOMBERG BUSINESSWEEK. *ADULTS WHO SAY SANTA HAS A VERY OR SOMEWHAT IMPORTANT ROLE IN THEIR HOLIDAY CELEBRATIONS. DATA: YOUGOV, DECEMBER 2018

◀ $24.95. And Airbnb Inc.–whose main short-term lodging business has been crushed by Covid–is marketing online experiences with St. Nicholas put on by members of its far-flung network of hosts. They include everything from chatting with a "real" Santa Claus in Lapland, Finland, to sharing story time with Santa Mike in Los Angeles to conversing with a so-called Sign Language Santa in Athens, Ga.

HireSanta, a platform where retailers and others find Clauses for appearances, has seen interest in virtual visits spike about 500% from last year, according to founder Mitch Allen. Still, to accommodate those preferring traditional in-person visits, HireSanta has created its own "Santa Shields," plexiglass barriers with small built-in benches at the base for children to sit on while Santa chats with them from his chair on the other side. "Our expenses have gone way up, from both the development cost and then also creating these physical barriers," says Allen, who pitched his on-demand Santa business on ABC's *Shark Tank* in 2018 and left with a $200,000 investment from entrepreneur Barbara Corcoran. "We're doing that so that we can actually provide our service. Our revenue is going to be higher this year, but our margins will be lower, primarily because of providing all of this safety equipment."

After years of hosting a parade of random children sharing their wish lists, only about 30% of Santas say they'll conduct in-person interactions as normal this year, according to a recent survey by the Fraternal Order of Real Bearded Santas, a group of performers founded a quarter century ago that boasts 450 active members. An additional 31% say they'll do them but with very strict conditions, such as physical barriers and temperature checks, while 22% say they won't do them at all.

Ric Erwin, the chairman of the Santa order, decided not to do any in-person visits this holiday season after his father-in-law died from Covid in May. During a regular year, he usually has 90 to 120 bookings in the weeks between Thanksgiving and Christmas, coming in close contact with anywhere from 5,000 to 15,000 people and making $12,000 to $15,000. This year, as of mid-November, he had 170 bookings, all of them to be done in a virtual format. "I promised my wife and my mother-in-law that I would take zero chances of bringing back the virus into this home, even if that meant giving up my Santa season this year," he says.

Joe McGrievy, a California Santa who's the fraternal order's vice president, is trying a different route: shelling out thousands of dollars to buy a red car and a green screen to do drive-up and virtual visits. He hopes those costs will be worth it, since he'll get to do more visits from home instead of traveling to appearances all over the state. But whatever he makes on these pandemic-tweaked gigs, it won't be anywhere near the $20,000 he usually brings in during Santa season. "I don't expect to hit more than $8,000 this year," McGrievy said early in the booking season. "That's my income. I take that $20,000 and I put $1,000 away in an envelope for each month; that way I live each month and have a certain income besides my Social Security. So this year that won't be happening."

Some entrepreneurs are betting that alternatives to the mall holiday experience will be in demand even when the pandemic ends. Wikipedia co-founder Jimmy Wales in November launched an app called Santa HQ that offers a live video call service with Santa. Wales expects high demand this season and doesn't see it winding down in years to come. "If the experience is good–and we're trying really hard to make it be a good experience with well-trained performers–then people will talk about it," he says. "They'll say, 'Oh yeah, this was fantastic.' It's much better than standing in line."
—*Carolina Gonzalez, with Natalie Wong*

THE BOTTOM LINE Mall operators and retailers have long counted on Santa Claus displays to lure more shoppers during the Christmas season. The pandemic will put that to the test.

Delta's Flight Plan to Avoid Trump's Tariffs

● The airline sends new jets on a world tour instead of basing them in the U.S.

Delta has made no secret about its aversion to the tariffs the Trump administration placed on European jetliners imported into the U.S. But more than just grousing about the fees, Delta Air Lines Inc. has found a way to sidestep millions of dollars of the levies: by initially routing new planes far outside its home country to such places as Amsterdam, Tokyo, and El Salvador.

The U.S. carrier has taken delivery of seven European-built Airbus SE planes since President Trump's levies took effect in October 2019. Rather than flying them to the U.S. as it's done in the past, Delta has based the aircraft overseas. The decision, coupled with the awkward definition of new planes in the tariff rules, has ▶

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◀ kept the jets from being considered imports even though some of them regularly enter the U.S.

Avoiding the tariffs has saved Delta, Airbus's biggest U.S. airline customer, precious cash, while customs records show that rival carriers have been charged the duties. Every dollar counts in an industry struggling to cut costs amid the collapse in demand caused by the pandemic.

"We have made the decision not to import any new aircraft from Europe while these tariffs are in effect," Delta said in a statement to Bloomberg. "Instead, we have opted to use the new aircraft exclusively for international service, which does not require importation."

The Delta strategy rests on language that classifies planes as used once they've flown for any reason other than testing and delivery. Tariffs on new-plane imports then don't apply, even if the aircraft eventually fly to the U.S.

Delta wouldn't discuss the financial details, but the savings are likely to be significant. Based on aircraft list prices, the anti-tariff strategy may have saved the carrier as much as $270 million, though the true amount is surely much smaller given the steep discounts customary on jetliner sales.

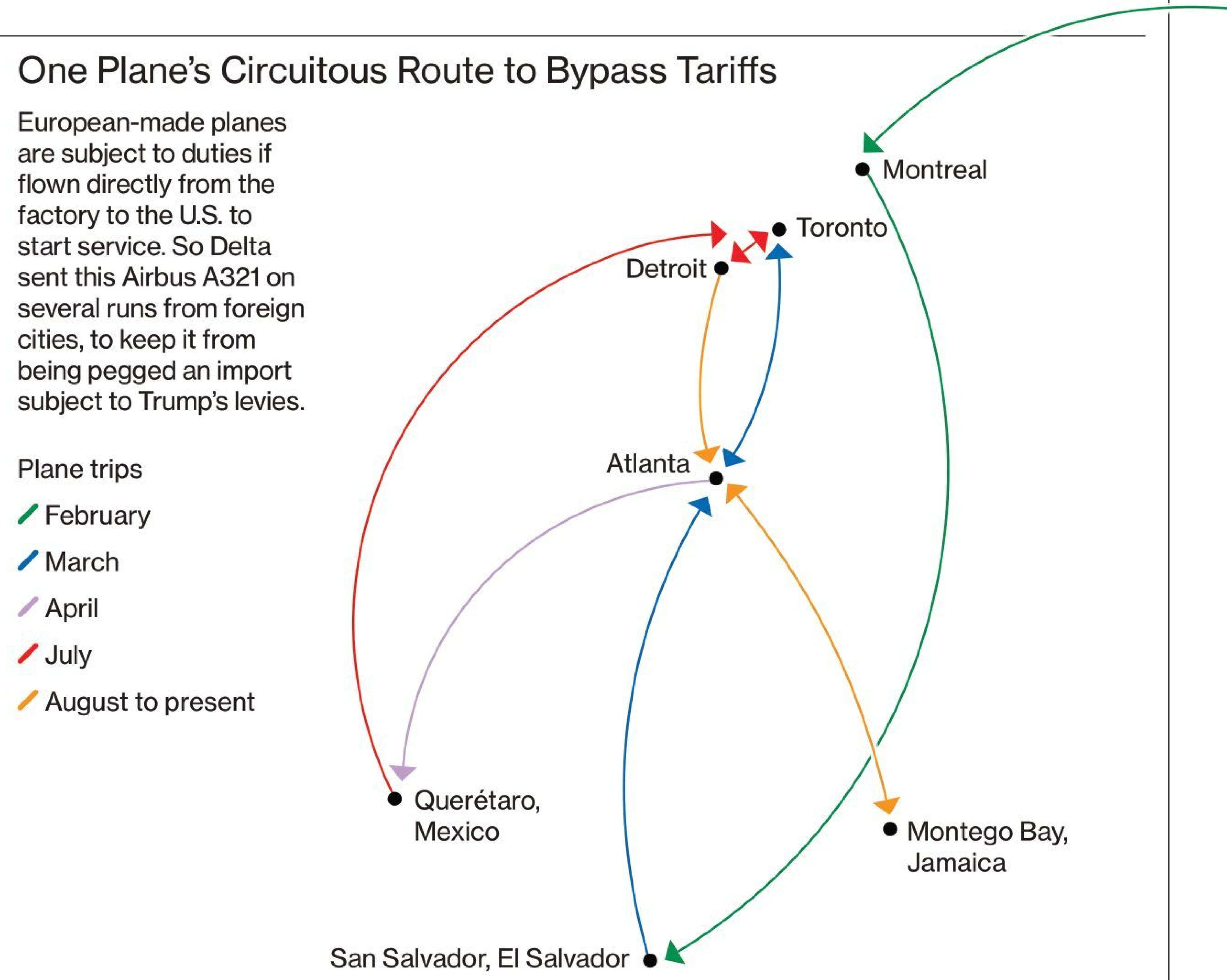
The airline's efforts illustrate how Trump's trade wars have prompted U.S. companies to reconfigure business practices to avoid tariffs, often in ways that make them less efficient. The administration imposed tariffs on $7.5 billion of annual imports from the European Union after the World Trade Organization ruled in favor of the U.S. in a long-running case over subsidies to Airbus. In addition to levies on French wine and Scotch whisky, large civil aircraft faced a 10% duty that was later increased to 15%.

Since the tariffs took effect, the U.S. has sought to collect more than $55 million on planes imported from France, Germany, Spain, and the U.K., countries subject to the higher levies, according to data provided by U.S. Customs and Border Protection. The CBP is barred from disclosing what it collects from individual companies, said spokesman Nathan Peeters. A spokesman for U.S. Trade Representative Robert Lighthizer, who ordered the tariffs, didn't respond to a request for comment.

In the case of the Airbus tariffs, the administration appears to have created the very loophole Delta may be using. The definition of a new plane—included in an annex attached to the original 2019 order imposing the tariffs—doesn't appear to have applied before that, says Jennifer Hillman, a former senior U.S. trade official now at the Council on Foreign Relations. Nor was the definition changed when the tariff rate went up, she says.

One Plane's Circuitous Route to Bypass Tariffs

European-made planes are subject to duties if flown directly from the factory to the U.S. to start service. So Delta sent this Airbus A321 on several runs from foreign cities, to keep it from being pegged an import subject to Trump's levies.



DATA: FLIGHTRADAR24

"If they had wanted to, they could have amended that definition," Hillman says. "So I don't think the U.S. has much standing to complain if planes are coming in with more hours than just testing and delivery and not paying additional duties."

According to the U.S. Trade Representative, a new aircraft is one with "no time in service or hours in flight other than for production testing" or delivery to the U.S. That suggests the plane is no longer new once it's flown a non-U.S. route for any other purpose. "It might just be sloppy writing of the law, which would be consistent with the current administration's aviation trade policies," says Richard Aboulafia, an analyst at Teal Group.

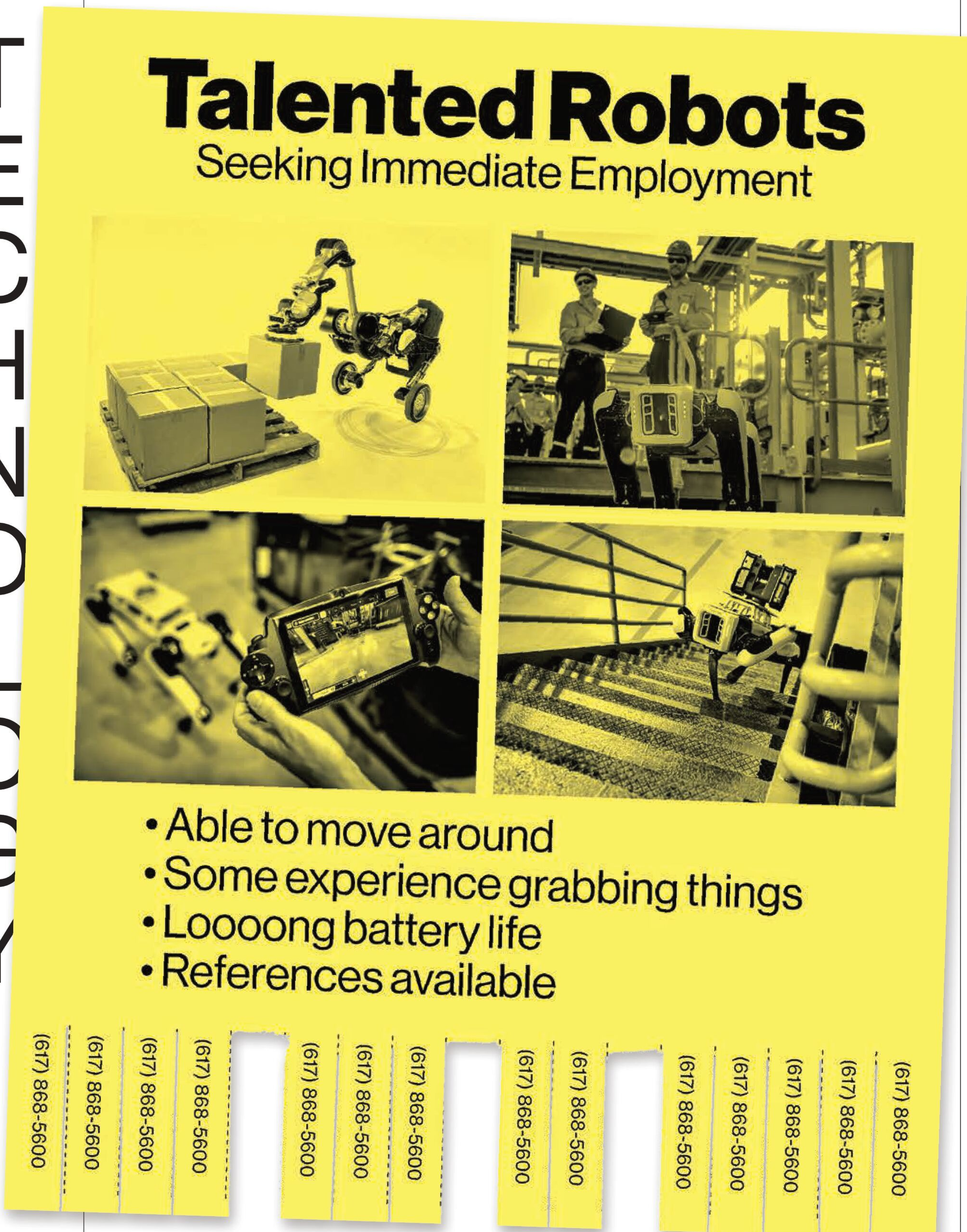
The Delta planes include a single-aisle Airbus A321 jet and six twin-aisle aircraft normally used for longer flights. The A321 was built in Hamburg and sent first to El Salvador—a hub for aircraft maintenance—where it stayed more than two weeks, according to Flightradar24. The jet was then used on routes to Canada and parked in Mexico at the height of the virus lockdown. Since August, it's ferried passengers between Montego Bay, Jamaica, and Atlanta, Delta's home base.

In its statement, the company said its actions enable its planes to be "treated the same as our foreign competitors' aircraft, which allows us to remain competitive in the global markets we serve." —*Siddharth Philip, Mary Schlangenstein, and Shawn Donnan*

THE BOTTOM LINE The U.S. put 15% tariffs on new jets imported from Europe. Delta dodged the fees by starting the planes' service in foreign nations—before using some in the U.S., duty free.

2

TECHNOLOGY



Boston Dynamics's robots are YouTube sensations but have yet to find their fortune

Edited by Joshua Brustein and David Rocks

Human baseball fans weren't allowed to attend the Fukuoka SoftBank Hawks game on July 7, but that didn't keep a collection of humanoid robots from supporting the home team with a peppy fight song while 20 mechanical dogs in baseball uniforms bopped along in unison. The canines were made by Boston Dynamics, and their performance perfectly illustrated the conundrum the company has faced since its founding almost three decades ago: It's created what may be the world's most technologically sophisticated–and expensive–parlor trick.

Boston Dynamics has long represented the cutting edge of robotics in popular culture, captivating YouTube audiences with the fluid movements of its animal- and human-like machines. The company has had bouts of profitability over its 28 years, but recently it's been losing millions of dollars annually, vexing SoftBank Group Corp., as it did its previous owner, Google. SoftBank is now preparing to sell it to Hyundai Motor Co. for about $1 billion, Bloomberg reported earlier in November.

The deal isn't complete and would require approval from the Committee on Foreign Investment in the United States (Cfius). Hyundai and SoftBank declined to comment, and a spokesperson would only say Boston Dynamics "continues to excite partners interested in exploring a deeper commercial relationship with our company."

Boston Dynamics also recently changed its longtime leader and hired its first head of sales. Chief Executive Officer Rob Playter says SoftBank was looking for profits. "While they want us to be a disciplined and commercial company, the actual direction of the company they are leaving to us," he says. "Pressure? Sure, there's pressure."

Playter became CEO late last year, replacing Marc Raibert, who founded Boston Dynamics in 1992 as an outgrowth of his academic work on walking robots at MIT. The company developed an increasingly impressive series of machines that moved in smooth, eerily lifelike ways. Many were funded by the Defense Advanced Research Projects Agency and other arms of the U.S. military.

Google purchased Boston Dynamics in 2013 and cut short the company's military contracting work to focus on research and development. Owning the company cost Google about $50 million annually, according to a person familiar with the matter who asked not to be identified discussing private information. It sold Boston Dynamics to SoftBank, a famously deep-pocketed tech investor, in 2017 as part of a broader attempt to shed business units with weaker prospects for near-term profitability. The price wasn't disclosed at the time, but two people familiar with the matter say SoftBank paid about $165 million.

Because of the potential military applications, the sale needed approval from Cfius. The agency stipulated that executives at the Japanese conglomerate couldn't hire or fire management, direct the product road map, or have access to Boston Dynamics's intellectual property, according to people familiar with the matter.

By then the machines had started to seep into popular culture. The company's latest robotic dog model, Spot, has become a YouTube sensation. In one 2018 clip with more than 60 million views, one of the yellow, four-legged machines is thwarted by the knob as it tries to open a door. Another version of Spot, this one equipped with a mechanical hand, turns the handle, and the pair pass through. Although the robots trot along amiably enough in the video, many viewers likened it to a scene from *Jurassic Park* in which velociraptors learn to open doors, to terrifying effect.

Since joining SoftBank, Boston Dynamics has tripled its staff, to 300 people, and moved into new headquarters at a cost of $20 million, according to a person familiar with the matter.

Paying for the robot company's operations cost SoftBank upwards of $150 million annually, one person familiar with the matter says. Late last year, SoftBank made a new push to steer Boston Dynamics toward profitability, accelerating an effort that had started under Google. Playter describes the changes as a logical development after years of internally funded R&D under Google. "Since the SoftBank acquisition and with the maturation of the Spot robot, the company has resumed commercialization of our technologies," he says. The billion-dollar price tag would be justified largely by progress on applications like these.

In October the company played host to 800 virtual attendees at its first customer and developer conference. Videos showed Spot conducting dangerous power plant inspections of pipes, monitoring a thermal exhaust treatment facility, and taking temperatures of Covid-infected patients at a Boston hospital.

Some of these things are already happening. The company has sold about 400 of the machines, which start at $75,000 each, bringing in at least $22 million in revenue. Architectural giant Foster + Partners is testing out a Spot robot topped with a scanner to track progress at building sites. The robot is safer than the drones the company has tried for the same tasks, has longer battery life, and elicits more favorable reactions from human staffers, according to Foster partner Adam Davis. ▶

"Could those robots do something we haven't thought of yet?"

● Spot's tasks include site inspection and taking temperatures of Covid-infected patients

PHOTO ILLUSTRATION BY 731; PHOTOS: BOSTON DYNAMICS (1); FORD (2); WOODSIDE ENERGY (1); SPOT: TRIMBLE

◀ These capabilities are impressive but hardly unique to Boston Dynamics, says Remy Glaisner, a Boston-based robotics analyst at International Data Corp. "The applications they are right now displaying, it's not just that there are other types of robots that do that, and probably do that much better," he says. "It's more about, 'Could those robots do something we haven't thought of yet?'"

Playter says he's most excited about a robot called Handle, which Boston Dynamics won't release for sale for two years. Handle, which spins adroitly on two large wheels, is designed to automate tasks like moving boxes on and off pallets and perhaps even unloading boxes from trucks, a notoriously tough job for a robot. These may be the kinds of unglamorous tasks the company focuses on if the sale to Hyundai goes through. But the carmaker, which has experimented with ideas for walking cars, could also have an interest in the company's quadruped technology.

The robotics industry's lack of an obvious leader leaves room for Boston Dynamics robots to mature into more than automated baseball fans, according to Glaisner. "There's no Google of the robotics industry," he says. —*Sarah McBride, with Kyunghee Park*

THE BOTTOM LINE Boston Dynamics may soon be sold again, as SoftBank grows impatient with the company's prospects for turning its remarkable robots into a profitable business.

A Covid Boost for Flu Fighters

● Developers of influenza vaccines are benefiting from the focus on the coronavirus

The billions of dollars plowed into Covid-19 vaccines have yielded promising results in tests by Pfizer, BioNTech, and Moderna–welcome news in the battle against the global outbreak. But for scientists studying another respiratory ailment known to trigger pandemics–influenza–the news is equally important, because it augurs an acceleration of their research. "What you are seeing are several technologies that will be tested all at once," says Gregory Glenn, research chief for Novavax Inc., which is working on Covid and flu vaccines. "It's kind of the world's greatest technology bake-off: You're going to see how the vaccines perform."

The influenza viruses that infect people change constantly, so twice a year–around the peak of the flu seasons in the Northern and Southern Hemisphere winters–the World Health Organization makes its best guess about the strains likely to emerge the following year. Pharmaceutical companies use the information to develop vaccines and soon begin production, typically by injecting viruses into hundreds of millions of chicken eggs where they grow for a few days before extraction. After several weeks of further processing, in late summer manufacturers send the flu shots to clinics and pharmacies for distribution to patients throughout the fall.

Some years the procedure works reasonably well; other times its performance is abysmal. Vaccines have been anywhere from 10% to 60% effective over the past 15 years, according to U.S. infectious disease expert Anthony Fauci. "Once the vaccine production process is initiated, it is nearly impossible to begin anew if a different strain emerges," Fauci told Congress last year.

The technology for incubating viruses in eggs was developed in the 1940s by an Army-backed research team co-lead by Jonas Salk, who later became famous for his polio vaccine. A drawback of the process is that viruses can mutate while they're growing in eggs, so they don't always offer protection from the illnesses circulating among humans. Egg-based "technology got kind of stuck in time, a victim of its own success," says John Shiver, vaccine development chief at Sanofi Pasteur Inc., the No. 1 maker of flu shots.


● Shiver

Some techniques being explored by Covid researchers are fundamentally different. Instead of virus proteins, the Pfizer-BioNTech and Moderna vaccines contain so-called messenger RNA, or mRNA–genetic instructions that prompt the body to produce disease-specific antigens, effectively turning it into its own vaccine factory. The technology is still new, and a successful debut against Covid would bolster public confidence in mRNA vaccines for flu and other diseases, says Meagan Fitzpatrick, an assistant professor at the University

▲ A Sanofi flu vaccine lab in Pearl River, N.Y.

of Maryland's medical school. "This is going to be a huge boost," she says. "The biggest hurdles will already have been overcome."

A second flu technology poised to get a lift from Covid research is the so-called recombinant vaccine, an idea being pursued by Novavax and Sanofi. In this process, scientists remove from the virus DNA that triggers a response from the immune system. Technicians combine the DNA with genetic material that can penetrate cells of insects such as moths, which grow proteins well and are easy to cultivate. These then produce antigens that can be harvested for use in a vaccine. A subsidiary of Sanofi signed a $226 million deal last December with the U.S. Department of Health and Human Services to expand production capacity of recombinant flu vaccines at a facility in Pennsylvania.

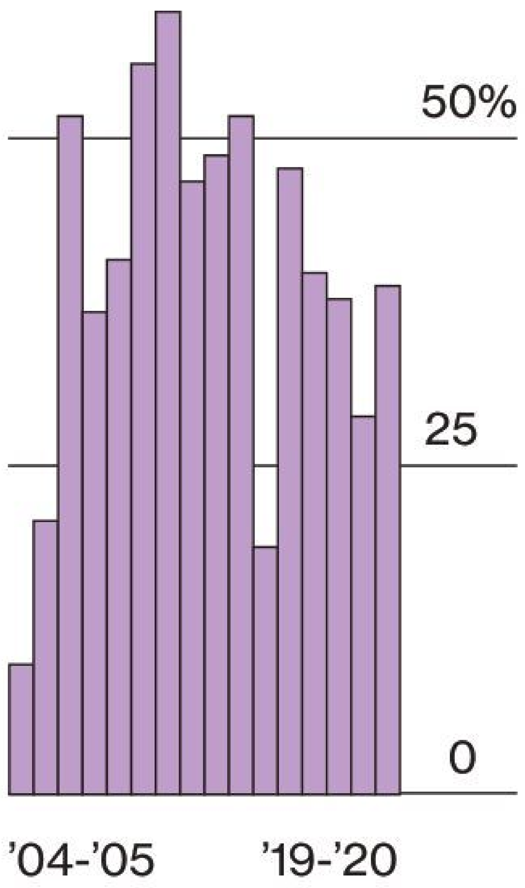
Growing fears of what some are calling a "twindemic" have sparked record interest in flu shots this year, with almost 200 million doses available in the U.S., an increase of as much as 13% from 2019. Although not being used for Covid research, so-called cell-culture vaccines—which also avoid using eggs—are benefiting from that interest. In this approach, the virus is grown in cells originally derived from mammals, which are preferable because the virus doesn't seek to adapt to its avian host. Australia's CSL Ltd., the No. 2 maker of flu shots, has expanded annual production of cell-based vaccines at a North Carolina plant from 2 million doses to 30 million, and it says it will largely phase out egg-based flu vaccines in the U.S. by 2026. On Nov. 16, CSL said it will spend about $585 million on a new cell-based facility in Australia to make flu vaccines and anti-venoms for snake bites.

Only a handful of companies have embraced the cell technology, which requires a lot of expertise and upfront investment. Some in the business say there's scant reason to give up on flu prevention methods they know. While Sanofi plans to expand production of its recombinant flu vaccine, it will continue to use eggs as well. And GlaxoSmithKline Plc says eggs enable fast and inexpensive production of the millions of doses needed to make sufficient supplies every year.

Still, the renewed focus on influenza and the money being spent on Covid prevention will hasten the shift away from eggs as new technologies become more widely accepted, says Leo Poon, head of public-health laboratory sciences at the University of Hong Kong. "That will definitely help develop better and more effective vaccines for other diseases," he says. Pfizer, BioNTech, and Moderna, which don't offer flu shots today, are already applying mRNA vaccines to more than just Covid. The technology "will also disrupt the flu market," Mikael Dolsten, Pfizer's chief scientific officer, said on a call with analysts in July. "We see a very large opportunity." —*Bruce Einhorn*

THE BOTTOM LINE Almost 200 million flu shots will be available in the U.S. this year, but they're typically only 10% to 60% effective. Ideas borrowed from Covid research promise to improve results.

▼ U.S. flu vaccine effectiveness by flu season



PHOTOGRAPHS BY BRYAN ANSELM FOR BLOOMBERG BUSINESSWEEK. DATA: CDC

This Market Is for Noobs

Professional money managers aren't beating the market. The novice trader next door might be

At a time of peak complexity in markets—when a pandemic rages, a recession seethes, and new-wave experiments are conducted in fiscal and monetary policy—it's not the quants or the mutual fund managers or the proprietary traders or any other Wall Street constituency who are figuring out the situation first. It's the amateurs.

A basket of the stocks that newbie traders love most soared 62% for the year through Nov. 17, according to Goldman Sachs, which created the list. That beat the usually bulletproof S&P 500 by 50 percentage points and almost doubled the return on a list of hedge fund favorites. Thanks to bets on cruise operators, airlines, and electric cars, screenshots of six-figure brokerage accounts inundate Twitter. In the age of behavioral economics, the financial world is obsessed with diagnosing the biases and talents that explain investing success. In that context, two theories are usually offered to explain how retail investors came to rule 2020.

The first is that individual investors, unlike the pros, don't have to worry about their careers. Unencumbered by risk controls and unconcerned with how their decisions would look to others, quarantined amateurs flush with time were simply freer than their suited counterparts to invest at the March bottom. They correctly surmised that a recovery would rescue the companies that bore the brunt of the plunge. They "bought low" and reaped rewards equal to their daring.

The second theory is that they had a stroke of tremendous fortune. Believing a $5 price tag made a stock cheap and $1 a share must be the bargain of the century, newbie day traders made virtually every error amateur investors are capable of, including mistaking the stock drops after bankruptcy filings as buy signals in penny stocks. Egged on by Twitter impresarios whose main expertise is aggregating followers, everyone got saved when the Federal Reserve's rescue efforts and a bit of happenstance caused virtually every one of the decisions to pay off.

Ask the day traders, and they'll say they know what they're doing. Assailed by the pros for believing stocks only go up, they point out that in a year when 60% of sessions have been positive, closing your eyes and buying has been exactly the right investment model. Already, 240 days have gone by

Edited by Pat Regnier

since the bottom on March 23 of the quickest fall into a bear market ever, and $11 trillion in equity value has since been added. Still, the suits see it ending in tears. "You get in, you open up a Robinhood account, make a few successful trades, and you ride the trends," says Giorgio Caputo, senior fund manager at J O Hambro Capital Management. "The risk is that someone might get lucky, and unfortunately they may put too much emphasis on what ultimately was a lucky outcome."

At least 8 million new accounts have been opened in 2020 across brokerages including Charles Schwab, E*Trade Financial, TD Ameritrade Holding, and Robinhood Markets, all of which permit some version of free trading. Altogether, retail traders now make up a fifth of equity trading volume, second only to behind-the-scenes middlemen such as market makers and high-frequency traders, according to Larry Tabb, Bloomberg Intelligence's head of market structure research.

Ayden McCloskey, 22, says he learned on the fly. A construction worker and delivery driver for DoorDash Inc. in Minnesota, he says he lost $20,000 shortly after he started day trading in March, in part because of bets he made on the market going lower. "I fought the Fed for too long," he says. "That was something, as a newbie, that I shouldn't have done." So he changed course and made it all back. He says this agility makes investing fun in a way it can never be for a Wall Street veteran. "It really is my life," he says. The pros "burn out because of the pressure."

The pros, for their part, are skeptical. As of now, says Dan Egan, managing director of behavioral finance and investing for robo-adviser Betterment LLC, the retail hot streak hasn't lasted long enough to say anything definitive about it. "It's been an easy market to think that you're a genius in," he says. "It will be interesting to see if those people who have been playing a very simple version of the stock market game, if they are going to say, 'Oh, I just got lucky that I was in during a period when these things were going on,' vs., 'I actually have some ability to play the market in all environments.'"

Quantitatively speaking, a good summer comes nowhere near proving anyone has investing skill. In a 2017 paper titled *What's Past is NOT Prologue* by James White, Jeff Rosenbluth, and Victor Haghani of Elm Partners Management, the trio suggest that even two decades of performance isn't enough to fully distinguish whether a fund manager is anything other than average.

Still, give credit where it's due, says Julian Emanuel, chief equity and derivatives strategist at BTIG. Retail investors rode the waves for months. While Wall Street counseled prudence, some of the stock market's highest fliers went on to gain on average an additional 20%. Tesla Inc. surged 80% in August, to as high as $498 a share, adding to what was already a 240% year-to-date gain. Shares of Zoom Video Communications Inc. doubled, to $458 a share, in roughly the same time period. Apple Inc. added $400 billion, or 26%, to its market value. "The public can be credited for outperforming the markets simply because there was what we would call a suspension of disbelief and a willingness to stick with the trend," Emanuel says. "We wouldn't call that luck. In certain environments, that's a ▶

▼ Change in index since Dec. 31

Stocks popular with retail traders*

S&P 500

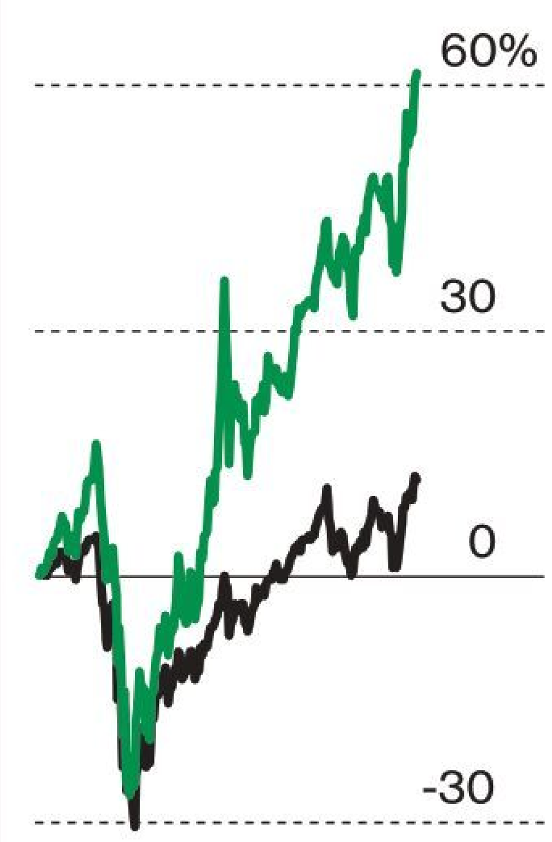


PHOTO ILLUSTRATION BY 731. GETTY IMAGES (5); ALAMY (1). * AS MEASURED BY GOLDMAN SACHS'S BASKET OF THE MOST POPULAR U.S.-LISTED STOCKS TRADED ON RETAIL BROKERAGE PLATFORMS. DATA: GOLDMAN SACHS, BLOOMBERG

◀ tragic flaw, but in 2020 that has been a strength."

While the S&P 500 has swung an average 1.5% a day in 2020, the second-most in the last seven decades behind 2008, data compiled by Bloomberg show, the trend of those moves has been remarkably constant in its direction: higher. Either despite or because of that, only 39% of large-cap active fund managers are beating their benchmarks, data from Jefferies LLC show.

The market has cooperated to an uncanny extent with certain appetites of day traders—particularly their love of stocks with low per-share price tags. On March 23, the day stocks bottomed after the coronavirus crash, more than 420 stocks in the Russell 3000 carried prices below $5. Since then, those shares have surged an average 124%. Meanwhile, companies with a share price above $5 have gained an average 74%. A solid gain, either way, but an even bigger win for fans of lottery tickets.

Robinhood clients bought the dip in March, with daily trading volume three times what it was in the fourth quarter of 2019 and the amount of cash added to accounts 17 times the monthly average that same quarter, according to a Robinhood spokesperson. At TD Ameritrade, clients were net buyers in March, "way before the rest of the market," says the firm's chief market strategist, JJ Kinahan, and have remained so. Users of TD Ameritrade, especially millennials, gravitated to travel-related stocks at the bottom. At E*Trade, "traders acted quickly to buy the dip" and moved into sectors associated with a growing economy, says Chris Larkin, the firm's managing director of trading and investment products.

Zilla Saldana, 33, who works in public relations, has been trading for only a few months, but she says she hasn't made a single trade without doing her research. First, she bought shares of Apple. Then she branched out to the likes of electric vehicles. "I wouldn't say I got lucky," Saldana says. "I would say I did research and chose stocks based off of my findings."

To the professionals, all the euphoria may amount to a negative signal for markets, but knowing when to back down isn't easy. "When the casino starts printing money for the gamblers, there's something wrong going on," says Peter van Dooijeweert, managing director of multi-asset solutions at Man Solutions. But if in 1999 you used retail activity as a reason to sell stocks or bet against them, he adds, "you might've gotten fired six times before the market collapsed in 2000." —*Sarah Ponczek and Claire Ballentine, with Casey Wagner and Vildana Hajric*

THE BOTTOM LINE Retail investors are having a remarkable run in 2020, but the stars have all aligned their way. It takes years—or even decades—to distinguish skill from luck.

The Secret in the Sand

● The SEC investigates a company that said its sand could help frackers pump more oil

One by one, four employees of Fairmount Santrol were ushered into a cramped hotel conference room in Stafford, Texas, where they took turns explaining to their bosses why they thought the company was committing fraud. Some of the proprietary sand it was selling, they said, wasn't so special.

Sand? During the shale boom, this simple-sounding stuff was a hot commodity. Drillers use sand and water deep underground to blast hydrocarbons from rocks in the process known as fracking, and Fairmount was selling specially manufactured sand, including one product that was touted as "revolutionary." After the May 2017 meetings, nothing much changed in the way the business operated, attendees say. But others were watching, too. This summer the U.S. Securities and Exchange Commission informed the company, now called Covia Holdings Corp., that it was considering enforcement action.

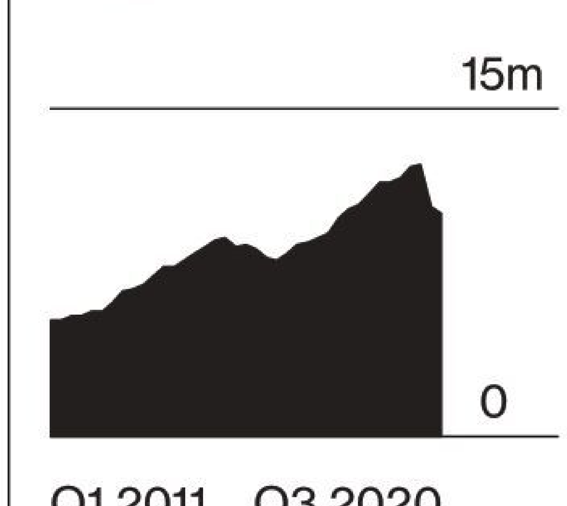
The company's special sand was never a dominant product, but in a competitive industry its marketing campaign drew attention to Fairmount Santrol. The company merged with another to form Covia in June 2018. It became the biggest frack sand producer in the country. Houston investment bank Tudor Pickering Holt & Co. called the new company the "800-pound gorilla in the sand game."

Some of its success, however, may have been based on a lie, according to interviews with former employees, multiple whistleblower complaints, and other court documents. They tell the story of Fairmount Santrol scientists running tests on the proprietary sand that found that some of the company's most-hyped products didn't perform all that much better than the stuff that came straight from the ground. But they saw a different story being pitched to customers.

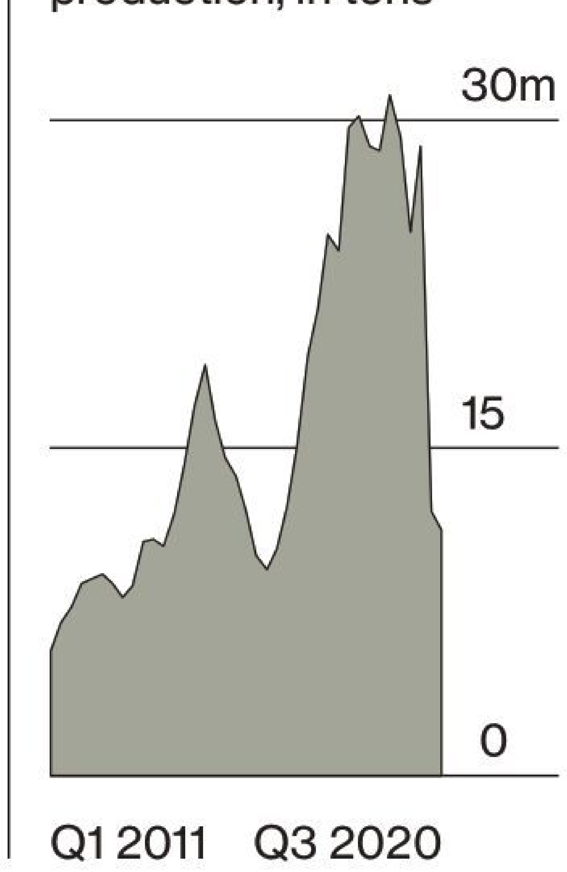
"This fraud is particularly brazen because the company aggressively markets scientific testing to create the illusion of proven performance and reliability," one whistleblower said in 2017 in a complaint to the SEC seen by Bloomberg. The next year another whistleblower blamed executives who "wholly adopted and reinforced a culture of covering up its lies without regard to who might suffer."

Covia, which first disclosed the SEC's inquiry in May 2019, says in a statement that Fairmount Santrol "fully investigated issues that were raised by employees" and determined there was no instance of fraud.

▼ U.S. oil production, in barrels



▼ Fracking sand production, in tons



It says it reported an employee complaint to the SEC in 2017 and has been cooperating with the regulator on its investigation into disclosures related to three products that have been discontinued.

In the wake of the shale bust, many investors have discovered that some oil driller assets are not as valuable as they thought. The sand business has echoed that idea. For Covia, the SEC probe adds a layer of uncertainty on top of a broader economic drubbing. The sand industry peaked at about $4 billion in market value in 2018, according to researcher Rystad Energy, but it's collapsed along with the 2010s fracking boom it fed. Next year the market for frack sand is expected to sink to half of what it was in 2019, Morgan Stanley says. The industry has suffered as the coronavirus continues to play havoc with oil consumption. Demand has plummeted, and Covia has suffered especially because many drillers grew tired of fancy sand and decided the cheaper, local type worked just fine. The company is one of four leading frack sand producers to seek bankruptcy protection this year, joining Vista Proppants & Logistics, Carbo Ceramics, and Hi-Crush.

In the 2010s, though, as fracking pushed the U.S. toward energy self-sufficiency, sand was a burgeoning business, and executives at Fairmount Santrol found a way to differentiate themselves. The company filed patents for products with names such as PowerProp. Its sales force went from company to company, hawking the new products to the biggest drillers. Drillers looking for a way to improve their output paid a premium at the time for specialized sand from Fairmount and other producers. At its peak price in the mid-2010s, a type of sand whose grains are coated with resin went for $250 a ton, a markup of $150 a ton over the cost of raw sand.

But inside Fairmount Santrol, scientists voiced their skepticism of some of the company's products. By May 2017 it was enough of an issue that the company rented the hotel conference room a few miles from its suburban Houston offices and set up a folding table. According to attendees, who spoke on condition of anonymity because they didn't want to jeopardize their job in the industry, four employees took turns speaking to a pair of executives.

The executives met with each employee for at least an hour, some for more than two. One of the people says it felt more like an interrogation than a fact-finding mission. A few weeks later, one employee, who'd received a negative work-performance evaluation two years before for questioning his bosses, says he received a message that the demerit would be removed from his file. Aside from that, Fairmount Santrol executives never talked about the meeting, he says.

The SEC first approached Covia about its investigation in March 2019. Weeks later, Jenniffer Deckard, Covia's chief executive officer, resigned. Covia said in a statement at the time that it was pursuing "a different direction" with its leadership. (Deckard was not one of the executives at the hotel meeting.) In June 2020, Covia filed for bankruptcy protection. Soon after, the SEC sent notice that its staff was recommending formal action against the company.

In a recent quarterly filing, Covia disclosed that the SEC had subpoenaed "certain former employees to testify regarding certain value-added proppants marketed and sold by Fairmount Santrol prior to the merger." (Proppants are materials, including sand, that prop open rock fissures to keep oil flowing.) Agency staff have interviewed all four employees who filed complaints with the SEC, some more than once, according to a law firm representing the whistleblowers.

More often than not, notices such as the ones the SEC sent to Covia lead to formal action. Whatever happens, the company faces an uphill struggle. In its bankruptcy filing, Covia warned that after emerging from Chapter 11, it most likely won't generate cash flow for the next two years unless creditors grant the company temporary relief from making interest payments. And sand, it turns out, isn't such a precious commodity anymore: Drillers have plenty of places to get it. "Bankruptcies aren't wiping out any capacity," says Joseph Triepke, founder of Infill Thinking LLC and a former analyst at Citadel LLC's Surveyor Capital. "It's going to be a very miserable slog." *—Rachel Adams-Heard and David Wethe*

THE BOTTOM LINE Fracking created a big market for sand—and for claims that pricier sand could help drillers pump more oil. Whistleblowers say one company exaggerated.

ILLUSTRATION BY DANIEL ZENDER FOR BLOOMBERG BUSINESSWEEK. DATA: RYSTAD ENERGY

Florida and the Fight for $15

● The Sunshine State is called a bellwether in the nationwide campaign to boost hourly pay

Pressure on Congress to boost the federal wage floor for the first time in 13 years is building after voters in Republican-leaning Florida approved a ballot initiative to raise the state's minimum wage to $15 an hour by 2026.

Seven states already have passed laws that will eventually bring their minimum wage to $15, but they're ones including California and New York that typically back Democrats and progressive labor policies. That Floridians bypassed their Republican-controlled legislature to enact the new wage by constitutional amendment will be impossible to ignore, says Chris Melody Fields Figueredo, executive director of the progressive Ballot Initiative Strategy Center in Washington.

"If there is a state that would be kind of a bellwether, it would be Florida because it is the first Southern state," says Saige Draeger, a research analyst at the National Conference of State Legislatures. "It would be the first major change in wages that we've seen in the South."

President-elect Joe Biden wants to more than double the federal minimum wage, currently $7.25 per hour, to $15, and is proposing an indexing system that will allow increases for lower-paid workers to keep up with those for middle-income earners.

Carrying out the plan will be easier if Democrats win both Senate seats up for election in Georgia on Jan. 5, which would give each party 50 seats in the chamber and allow Vice President-elect Kamala Harris to break a tie vote. The GOP has tended to block wage increases at the federal and state levels.

"Everyone who follows this recognizes that the main obstacle to raising minimum wages is Republican legislatures," says Ben Zipperer, an economist at the Economic Policy Institute, who's testified in Congress in support of lifting the federal minimum to $15.

In Florida, 51.2% of the electorate voted for Trump, and 61% approved raising the state's $8.56-an-hour minimum wage in increments, until it hits $15 in 2026. It "just goes to show that minimum wages are something that even the most conservative and most liberal voters in the country value," Zipperer says.

Emmanuel Hunt earned $5.54 an hour, not including tips, as a wheelchair attendant at Orlando International Airport before being laid off during the pandemic. He says his take-home pay was so low he couldn't afford to bring his children from St. Lucia to live with him in the U.S.

Elated as he is by the idea of making $15 an hour, he worries that the Florida Legislature will try to pass a bill to weaken the constitutional amendment before it takes effect.

"This $15 amendment was not about party, it was about workers," says Hunt, who's worked to organize his workplace on behalf of the Service Employees International Union. The union has been a driving force in the

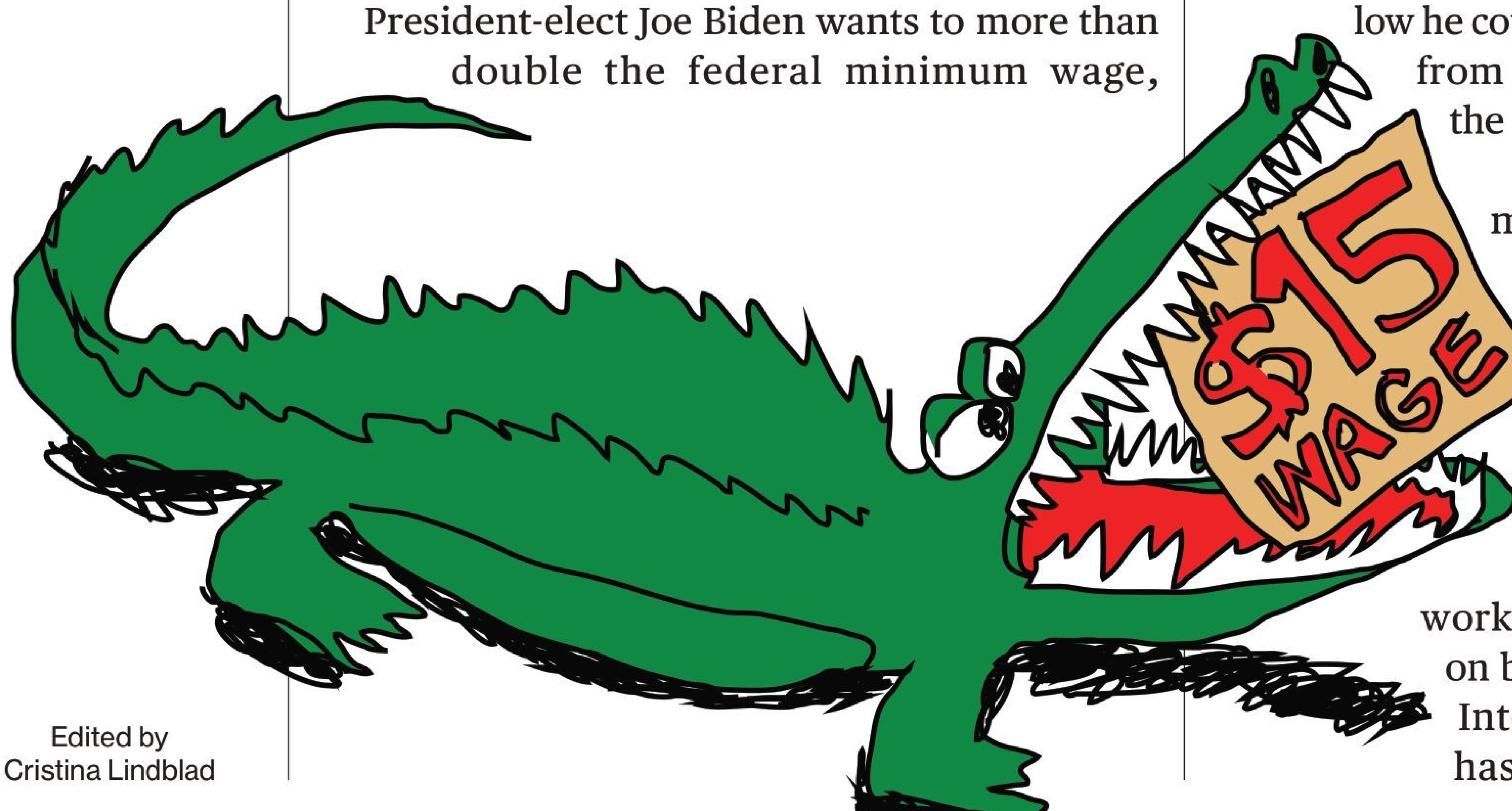


ILLUSTRATION BY 731

Edited by Cristina Lindblad

state-to-state battle for a $15-an-hour minimum.

Supporters and critics of minimum wage laws cite dueling studies to show how the measures boost people out of poverty—or lead businesses to cut jobs or employee hours.

Bolstering the argument for a wage floor, three researchers at the Federal Reserve Bank of New York studied retail and hospitality employment in counties along the New York-Pennsylvania border after New York hiked its minimum wage in 2013. Because Pennsylvania hadn't raised its minimum, the experiment offered a chance to see whether the New York counties would lose jobs.

In fact, as New York's minimum wage climbed to above $10 an hour, leisure and hospitality employment rose in those counties when compared with ones in Pennsylvania. Meantime, employee earnings rose significantly more on the New York side, the researchers found. At retail businesses, employment dropped on both sides of the border at roughly the same rate, reflecting an industry decline, but New York workers still saw stronger earnings growth.

A 2019 analysis by the nonpartisan Congressional Budget Office found that increasing the minimum wage to $15 by 2025 would boost the income of 17 million Americans, but would also cause 1.3 million to lose their jobs. Losses would fall disproportionately on part-time workers and adults without a high school diploma, according to the study.

Organizations that represent industries with a high proportion of hourly workers warn against increasing costs for companies during a pandemic that has millions of small businesses clinging to life. "With many businesses struggling to keep their doors open, now is not the time to place additional burdens on employers and stifle the job creation our economy desperately needs to recover from the pandemic," says David French, the National Retail Federation's senior vice president of government relations.

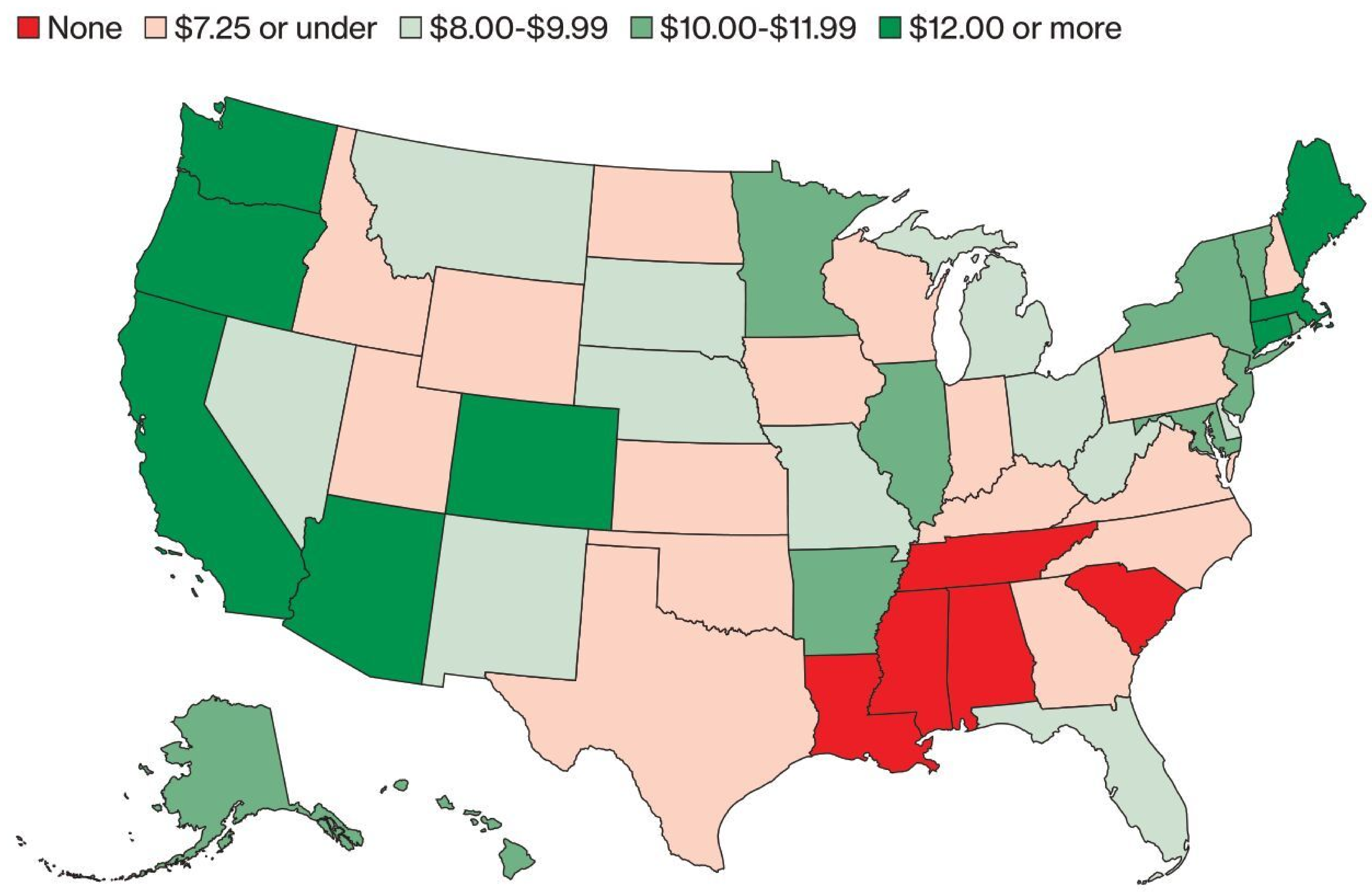
Several large corporations have increased hourly wages on their own accord in recent months. In July, Target Corp. raised its starting wage to $15 an hour. And in September, Walmart Inc. hiked wages for 165,000 hourly associates nationwide.

Labor groups pushing for a higher minimum wage are drawing inspiration from the Florida vote. It "absolutely does create more momentum and pressure," says Allynn Umel, national organizing director for the union-funded Fight for $15 campaign. "The fact that 6.4 million Floridians voted to increase the minimum wage last week, including millions from both parties—it shows the power of worker voices."

The last increase to the federal minimum wage passed in 2007, when a Republican was in the White House but Democrats commanded both houses of Congress. President Barack Obama called for an increase in his 2013 State of the Union address, but was unsuccessful in getting any adjustments through a Republican-controlled Congress.

Major business groups in Florida, including the Florida Chamber of Commerce, fought against the wage amendment, warning that in a worst-case scenario it could wipe out as many as 500,000 jobs. If, for example, states neighboring Florida keep the lower federal minimum wage, businesses in northern Florida might relocate to southern Georgia or into Alabama and still be able to ship their products into Florida, argued Jerry Parrish, chief economist for Florida Chamber Foundation.

State Minimum Wages



MINIMUM WAGES AS OF OCT. 1, 2020. DATA: U.S. DEPARTMENT OF LABOR

Ordinarily, an increase to $15 an hour over several years would give businesses enough time to compensate for the higher labor costs, says Dilip Kanji, a businessman from Tampa who owns a mix of hotels, restaurants, and rent-to-own retail franchises. But he hastens to add that these aren't ordinary times.

"We're now in a pandemic, with unemployment very high," Kanji says. "We now have a Democratic government coming in, and we don't know how that's going to be." *—Olivia Rockeman, Claire Miller, and Michael Sasso, with Cataria Saraiva*

THE BOTTOM LINE Voters in Florida approved a measure to raise the state's minimum wage to $15 by 2026, lending momentum to a national campaign to raise the federal wage floor.

Unfreezing the Everest Economy

● Nepal has lifted a seven-month travel ban and is welcoming climbers again. But will they come?

After closing its mountains to climbers in March because of the coronavirus pandemic, Nepal is trying to restart the economy that revolves around Mount Everest. But it's pretty clear that 2020, which officials had christened "Visit Nepal Year," is going to be a washout.

The tiny nation is home to 8 of the 14 highest mountains on Earth. Tourism accounted for almost 8% of gross domestic product in 2018, according to the London-based World Travel and Tourism Council, with the sector supporting more than 1 million jobs. Everest expeditions alone contributed more than $300 million last year.

The Nepali government had set an ambitious target of welcoming 2 million visitors to the country this year, almost double 2019's number. Instead, international arrivals fell to 180,131 through October, from 795,199 in the same period last year.

Authorities banned incoming international flights in March out of fear the novel coronavirus would overwhelm the country's limited health-care infrastructure. (The nation of 29 million had recorded approximately 213,000 Covid-19 infections and 1,259 deaths as of Nov. 17.) The Ministry of Culture, Tourism and Civil Aviation permitted flights to resume in September, subject to several restrictions. But trekkers and mountaineers weren't allowed into the country until the middle of last month.

New arrivals must submit proof of a negative Covid-19 test administered in the previous 72 hours and are required to quarantine in a hotel for seven days before heading into the mountains.

They must also be insured against the possibility that they contract the virus while in the country so they won't saddle the government with the cost of caring for them.

Despite the lifting of the travel ban, there's little hope that Nepal can make up its tourist shortfall in what remains of the year. Spring is peak season in the Himalayas, with only 10% of summits occurring in the fall, according to the Himalaya Database.

More than 320 mountains are available for mountaineering expeditions, but Everest is the main attraction. It generated $4 million in royalties last year, four times more than the rest combined. Expeditions to reach the 29,035-foot summit have a maximum of 15 climbers per permit, with a per-head cost ranging from $35,000 to more than $100,000. The sum covers transportation within Nepal, provisions, base camp tents and other gear, as well as the wages of mountain guides, porters, and cooks.

None are more dependent on the Everest economy than the more than 100,000 Sherpa people living in Nepal, who are famous for their ability to labor at high altitudes where the air contains less oxygen.

Expeditions usually have a 1:1 ratio of trekkers to hired climbing Sherpa. During the spring climbing season, which starts in May and ends around the first week of June, a Sherpa guide can pocket $6,000 to $12,000—a princely sum in a country where the minimum monthly wage is less than $200. It's hazardous work that involves installing about 40 ladders and more than 12 kilometers (7.5 miles) of rope to create a secure path across the melting Khumbu Glacier. Meanwhile, a Sherpa cook working at base camp can earn around $2,000, while porters transporting baggage and camp supplies on foot make approximately $1,000 per season.

Most Sherpa have barely had any income this year. "I spent the last seven months in my village helping my mother in potato fields, working in maintenance of my own lodge, and other regular activities. It was very difficult," says Phurba Tenzing Sherpa, a prominent mountain guide who's logged 14 ascents and is managing director of Nepali adventure company Dreamers Destination Trek and Expedition Pvt Ltd. Some expedition companies have started fundraising campaigns on GoFundMe to support the community of porters, cooks, and guides.

There's the possibility that this year's tourist drought could turn into a deluge next year, with potentially fatal results. The government, which doesn't limit the number of climbers on Everest,

▲ Sherpas guide climbers up the Khumbu Glacier

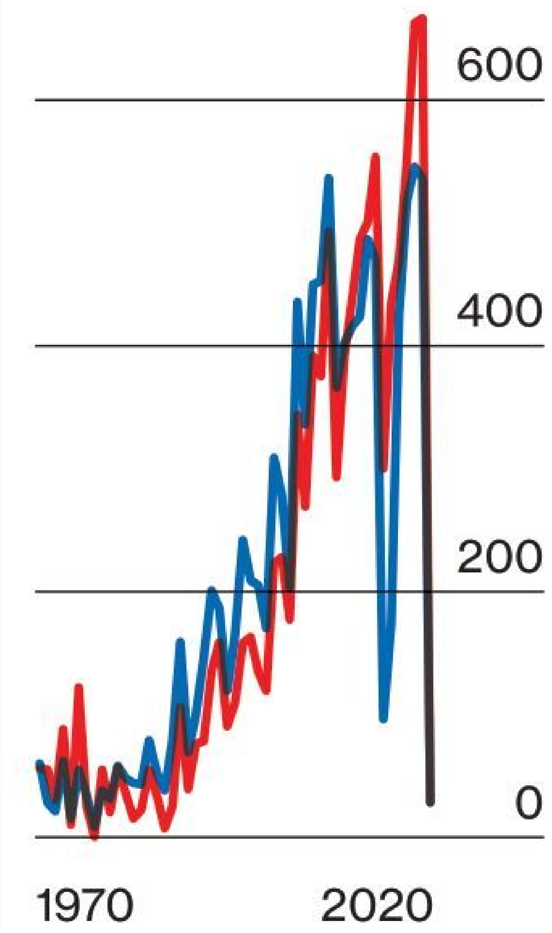
◀ Phurba Tenzing Sherpa

FROM LEFT: RAJNEESH BHANDARI/BLOOMBERG; GILES PRICE/INSTITUTE

▼ People above base camp on Mount Everest during the spring season

Climbers

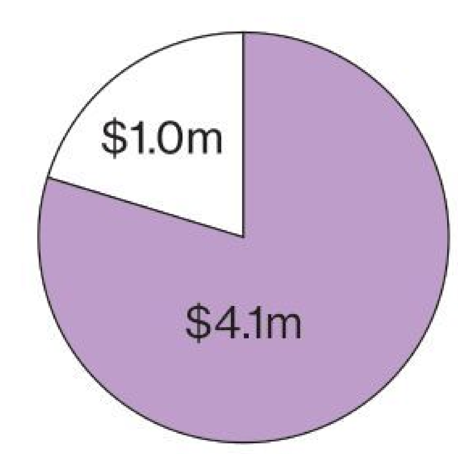
Hired Sherpas



▼ Government royalties from mountaineering in Nepal in 2019

Mount Everest

Other peaks



issued a record number of permits in 2019, leading to overcrowding near the summit that played a role in 11 deaths.

"I have a feeling that there will be a surge in climbers in 2021, as many climbers who had already planned their climb in 2020 had to postpone their climb due to the pandemic," says Ang Tshering Sherpa, president of the Nepal Mountaineering Association and chairman of Asian Trekking Pvt., based in Kathmandu. However, he thinks the risks of overcrowding can be mitigated, saying "the traffic jam on Everest in the previous years was due to lack of coordination among the expedition operators and government officers at base camp."

At the same time, he worries that economic difficulties in the U.S., Europe, and elsewhere could lead to a drop in new bookings, with climbers struggling to raise corporate sponsorship money to defray the cost of the ascent. "I would say I have a mixed feeling, but at the same time I am keeping a positive thought for 2021." —*Pablo Robles*

THE BOTTOM LINE Nepal's government had set its sights on luring 2 million visitors in 2020. Instead, a seven-month travel ban has devastated the industry that revolves around Mount Everest.

DATA: THE HIMALAYAN DATABASE; NEPAL MINISTRY OF CULTURE, TOURISM & CIVIL AVIATION

America Needs

YOU to Track Covid-19

ILLUSTRATION BY 731; POSTER: COURTESY LIBRARY OF CONGRESS

● The government struggled to publish high-quality data on the virus, so the unofficial Covid Tracking Project stepped up

At the start of 2020, Amanda French was in between academic jobs. Her mother had died about a year earlier, and she'd taken time off to help settle her affairs. Then the pandemic hit, interrupting her employment search, and she was alone outside Raleigh, N.C., with little to do but doomscroll through Twitter, as she described it.

Someone she followed online put out a call for volunteers to assist with a new project tallying how many Covid tests were being run across the U.S.—something the public wasn't getting a straight answer on from the federal government. "I had nothing to do. I was at home alone, anyways," French says. "It was much healthier than reading all the scary news." So on March 18, she signed up.

Since then, the Covid Tracking Project—run by a small army of data-gatherers, most of them volunteers—has become perhaps the most trusted source on how the pandemic is unfolding in the U.S. The website has been referenced by epidemiologists and other scientists, news organizations,

Edited by Amanda Kolson Hurley

state health officials, the White House Coronavirus Task Force, and the Biden transition team. There are other reliable sources for pandemic statistics, but the project stands out for its blend of rich, almost real-time data presented in a comprehensible way. "I think they've done extraordinary work and have met an important need," says Jennifer Nuzzo, a senior scholar at the Johns Hopkins Center for Health Security, which publishes its own set of pandemic data (and draws some information from the Covid Tracking Project). "They're tracking things that aren't being tracked."

This critical repository of health information started, improbably, with three journalists, a data scientist/biotech investor, and a couple of spreadsheets. Back in late February, the coronavirus was still a sleeper threat in the U.S., with new cases popping up in ones and twos around the country and signs of hidden spread on the West Coast. Officials in the Trump administration held briefings touting the government's rapid rollout of testing. But they couldn't answer one important question: How many tests were being done?

Alexis Madrigal, a technology writer at the *Atlantic*, and Robinson Meyer, an environmental writer at the magazine, decided to call every state and find out how many tests had been performed, plugging the numbers into a spreadsheet. While federal officials were talking about having distributed millions of tests, the two journalists reported on March 6 that fewer than 2,000 people in the U.S. had been checked for Covid.

Soon after the story published, Madrigal heard from an old friend, Jeff Hammerbacher. He and Madrigal had attended Harvard together. Madrigal got an English degree and became a journalist; Hammerbacher studied mathematics and went on to start the data team at Facebook.

Unbeknownst to Madrigal, Hammerbacher—who now helps found biotechnology companies but previously worked in medicine, applying data-science techniques to research—had his own sheet. He posted it online, kept updating it, and got feedback from readers. "I thought, 'I guess I'll keep doing this,'" Hammerbacher recalls.

When Madrigal's first analysis was published at the *Atlantic*, Hammerbacher emailed him: "Hey, did you guys use my spreadsheet for this?" Madrigal and Meyer's sheet was full of quotes from health department officials, while Hammerbacher's was set up to become a proper database. They decided to team up until the data from the government got better. (Co-founder Erin Kissane, an editor and community manager who works in journalism and technology, joined around this time.) They thought the project would last a week or two. "We just sort of figured, of course the CDC would put out this information," Madrigal says. "But it just never happened."

Search for the Covid Tracking Project on Google Scholar, which compiles academic literature, and you'll get more than 500 results, a sign of its standing in the scientific community. The project has helped force states to improve their disclosure of Covid data: In April, it started giving states letter grades on the quality of the data they reported. At first only 10 states got an A or A+; now 40 states and territories have reached that grade.

The project is a demonstration of citizen know-how and civic dedication at a time when the country feels like it's being pulled apart. Yet it's confounding that, almost a year into the pandemic, the Covid Tracking Project is doing what might be expected of the U.S. government. "It's kind of mind-boggling that it's fallen to a group of volunteers to do this," says Kara Schechtman, one of the project's early volunteers, who's since become the paid co-lead for data quality.

For decades the U.S. Centers for Disease Control and Prevention has tracked the flu and other illnesses in the nation. But its systems weren't designed for real-time surveillance of a new pandemic. Typically, states get information from health-care providers and put it into their systems, and that data is then sent to the CDC, a process that can take several days, according to the agency. "It's become abundantly clear that our systems of surveillance, both acquiring data and tracking data, are woefully inadequate," says Nuzzo. (Johns Hopkins's school of public health has received significant funding from Michael Bloomberg, the majority owner of *Bloomberg Businessweek*'s parent company.)

In late spring the CDC, which is part of the U.S. Department of Health and Human Services, created a team of more than a dozen people to scrape state health websites overnight and then confirm the information with the states in the morning. This is, essentially, what the Covid Tracking Project started doing in early March. The CDC's information flows into HHS Protect Public Data Hub, a tool launched in April to aggregate different sources of data on tests, cases, and hospitalizations.

If you visit HHS Protect to find Covid data for, say, Virginia, you might click through to the CDC's Coronavirus website, and from there to the CDC Covid Data Tracker homepage. It has state total cases and new cases over the past seven days, but new cases over the past 24 hours are under a different tab. Click on Virginia on the map, and ▶

● Approximate number of data points that Covid Tracking Project volunteers enter and check each afternoon

800

you're redirected to the Virginia Department of Health. By contrast, the Covid Tracking Project has an easily findable Virginia page that tells you new cases today, patients in ICUs, patients on ventilators, and other granular data points. (HHS Protect also has information on hospital capacity, but separate from the CDC pages; in July, the government directed hospitals to send their data to the HHS instead of the CDC, causing concern among some health experts.) A search on Google Scholar for HHS Protect yields only about 30 results, compared with the Covid Tracking Project's 500.

Ryan Panchadsaram, an adviser to the Covid Tracking Project who was deputy chief technology officer in the Obama White House, says the CDC is well-positioned to be a Covid data hub. "They can ask every hospital in the country for data, and they can ask all the labs and they can aggregate it," he says.

The CDC does, in fact, gather most of the same data as the Covid Tracking Project, and gets quite a bit more from its own channels. But that hasn't translated into data that's fully public, easily usable, or transparent. "The part which is frustrating is that only a few of those datasets are being made public," Panchadsaram says. "They've got all the pipes, they've got all of the relationships; they just aren't following through on the other side."

Paula Yoon, director of the CDC's Division of Health Informatics and Surveillance, talks about a shortage of resources and the difficulty of attracting talent to the public sector. There also needs to be a tighter relationship, she says, between public health bodies and the hospitals and doctors—and their records and IT systems—dealing with diseases on the front lines. "Until those two pieces come together and use common data standards, common messaging standards for moving data from one place to another—until we get to that point it's going to continue to be really hard," Yoon says.

In April, CDC Director Robert Redfield said that the pandemic would strengthen the agency: "The core capabilities are going to be finally brought to where they need to be." But the agency hasn't gotten the resources it needs. Earlier this year, the Trump administration pulled $700 million meant for the CDC's vaccine distribution planning and redirected it to Operation Warp Speed, a White House-run vaccine research and development effort. In October, Bloomberg reported that most of a $1 billion package meant to help the CDC with surveillance, testing, improvements to data systems, and other measures was stalled for five months.

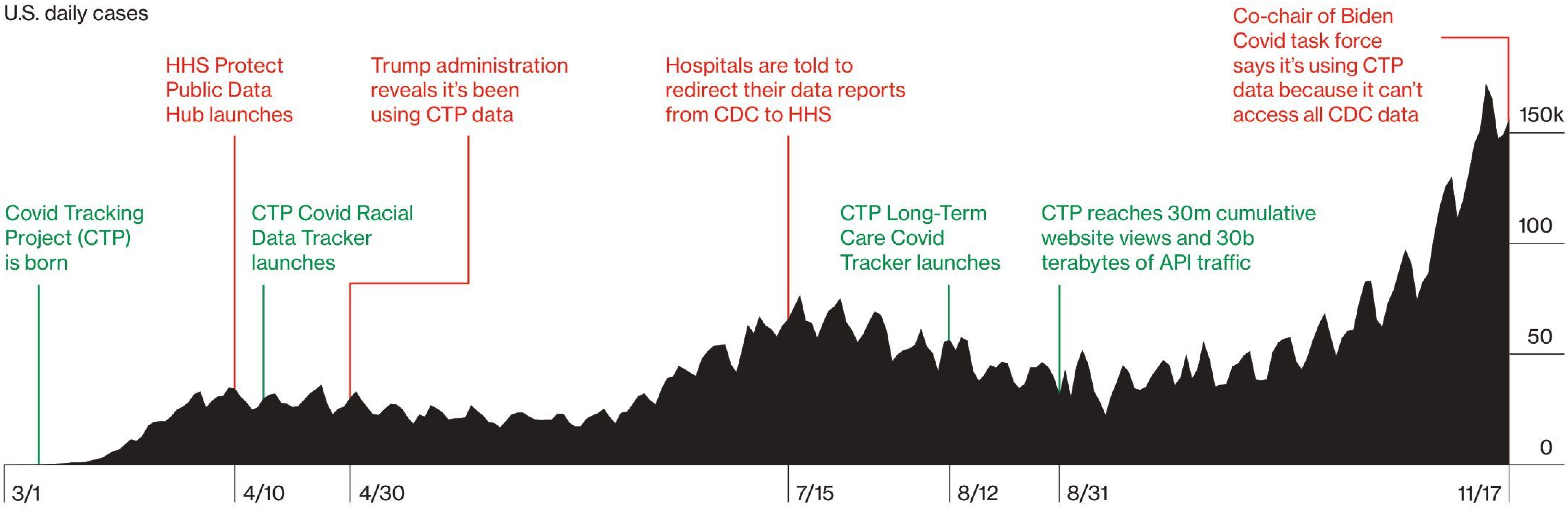
"It's kind of mind-boggling that it's fallen to a group of volunteers to do this"

In addition to 300 active volunteers, the Covid Tracking Project now has 30 paid staffers. The *Atlantic* provides it with legal, communications, and technology support and, crucially, has been the conduit for $1.42 million in donations from such groups as the Chan Zuckerberg Initiative, the Rockefeller Foundation, and the Robert Wood Johnson Foundation. But the magazine is otherwise hands-off. "I don't think [the project] could have been built inside the walls of a research institution or a media organization," says Kissane, the project's managing editor.

It is in some ways the quintessential pandemic-era startup, existing almost entirely on Slack, the workplace messaging platform. Most of the staff and volunteers have never met in person and know each other only through digital avatars and Zoom chats. They have a wide range of professional backgrounds: French, who is now a paid team leader, has a doctorate in English.

Racing to Keep Up With Covid Data

U.S. daily cases



DATA: COVID TRACKING PROJECT, BLOOMBERG REPORTING

I was recently allowed to sit in on a volunteer training session, watch a data shift, and do an afternoon's worth of data entry myself. Volunteers start as "checkers" who take a first pass at pulling data from the state websites. "Double-checkers" review it, and more-experienced staff help sort out problems and make judgment calls. Every afternoon the group enters and checks close to 800 data points from 56 states, territories, and the District of Columbia.

On my observation shift in early October, I see how fragmented state reporting systems are. Hawaii's hospital data, for example, is usually posted first on Twitter or Instagram by Lieutenant Governor Josh Green. But the afternoon is dragging on and Green hasn't posted yet—he's been doing a live online chat with Anthony Fauci. "I think he's too excited about Fauci," someone says on Slack. Eventually, the day's data is found in his Instagram stories, the disappearing posts on that platform.

"Lt. Gov Green is sneaky with his hospital data. Always got to check the stories!" one shift veteran posts. It's charming, but depressing: Instead of a data feed sent directly to the CDC, the Covid Tracking Project, and other organizations, the state put crucial public health data up on a social media site better known for vacation and food photos. Hawaii has since begun posting the data on its website.

When it's my turn to work a shift the next night, states with data at the ready begin to show up in a queue on the spreadsheet. I spot an error in the Kansas numbers, and one of the shift leads flags my post with a disco ball emoji. "Nice catch!" a person tells me on Slack. I make a mistake with Maine's data, transposing a digit, that's quickly caught.

From interviews with half a dozen staff and volunteers, and after spending time on the project's Slack, I pick up on a sense of disappointment at the decline of technocratic competence in government. I ask French if there are things about the project that depress her or make her angry, given that it can be seen as a fill-in for the government. "What gets me is the failure of the CDC to provide data standards to the states," she says, and then adds a few moments later, "That sounds like a very nerdy thing to be activist about."

There are signs the CDC is making changes. On Nov. 2, the agency posted a request for information seeking a company to help create a centralized platform for reporting Covid-19 test results. The agency is at work on the Covid Electronic Laboratory Reporting System, which will collect detailed information on each test performed in the U.S. It's already operational in more than 40 states,

▲ French

Yoon says, and gives the agency a closer look at how the virus is spreading: "We've been able to set up, in a very short period, a new system where the electronic laboratory data that is being sent to the states is in turn shared with us at CDC." The agency is also building new automated systems that can pull data directly from states and front-line health providers, according to Yoon.

President-elect Joe Biden has said his administration will create a "Nationwide Pandemic Dashboard" with real-time, local data down to the ZIP code level. The Covid Tracking Project has published a set of recommendations for the transition team. Madrigal says there are "many people in the CTP network who are in contact with the Biden team" but that the project doesn't plan on working directly with the new administration.

On Nov. 17 the project reported a grim statistic: 76,830, the number of people in the U.S. hospitalized with Covid-19, more than at any other point in the pandemic. As cases have surged, states have renewed restrictions on businesses, and officials are urging people to hold Thanksgiving on Zoom. President Trump has been touting vaccine candidates while Biden has cautioned that "we are still months away" from the end of the pandemic.

Because the country's response to the disease has become so politicized, Panchadsaram says, it's crucial to have a standard set of facts to agree on. "The shared reality we have binds us," he says. "If we can't all agree to what's happening with Covid, we can't agree what happens next." —*Drew Armstrong*

THE BOTTOM LINE The volunteer-powered Covid Tracking Project has become indispensable with the continuing absence of a robust, accessible U.S. government data hub on Covid-19.

PHOTOGRAPH BY PHYLLIS B. DOONEY FOR BLOOMBERG BUSINESSWEEK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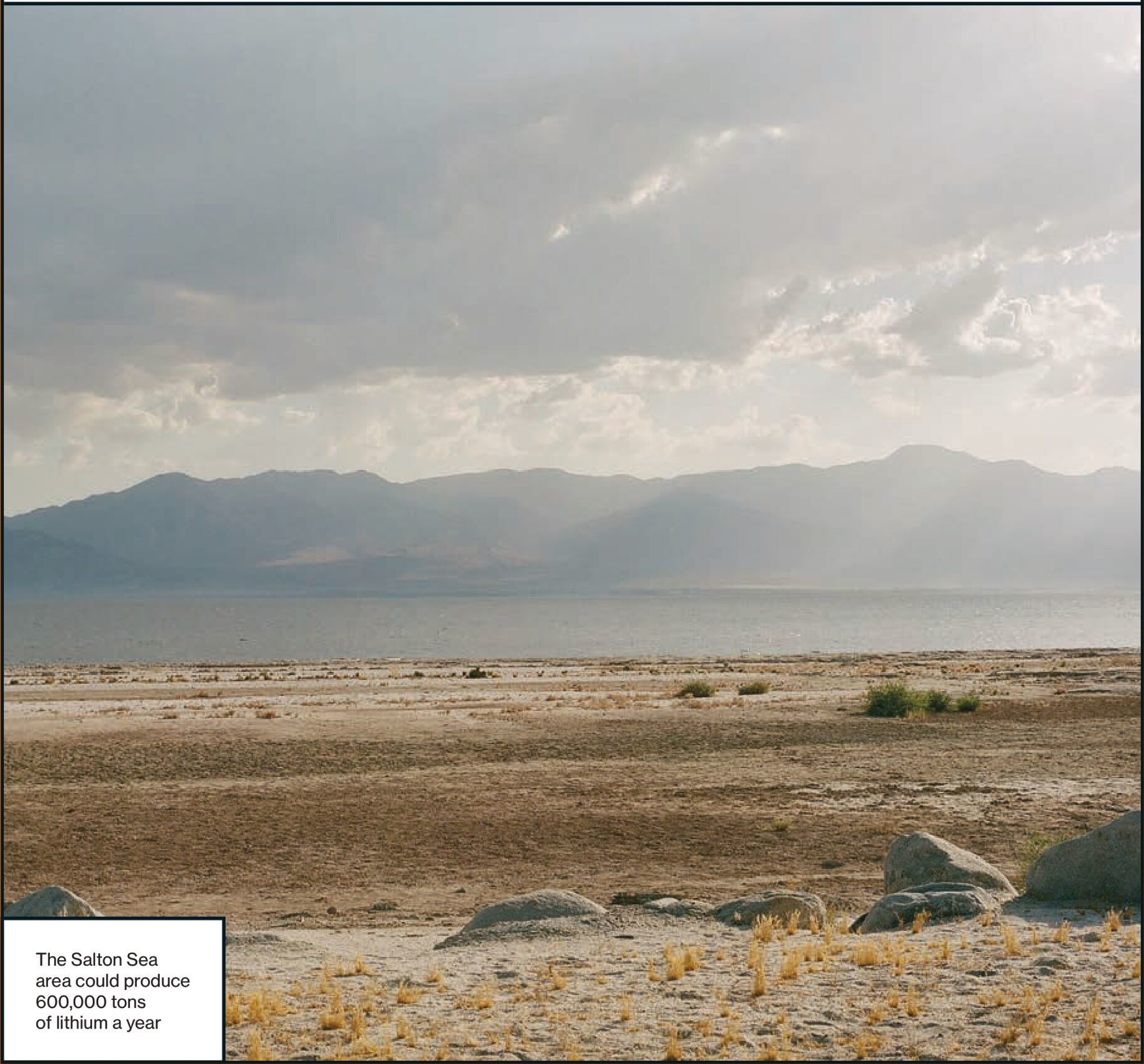
Innovation

Welcome to Lithium Valley

A dusty stretch rich in deposits of the metal used to make batteries may host California's next gold rush



The Salton Sea area could produce 600,000 tons of lithium a year

DEBBIE BENTLEY

November 23, 2020

Edited by Dimitra Kessenides

Read more on electric vehicle technology and the future of transportation at bloomberg.com/hyperdrive

Dust storms laced with toxins sweep across California's Imperial County, where mud volcanoes spit and hiss near the shores of the slowly shrinking lake known as the Salton Sea. The county is one of California's poorest, most of its jobs tied to a thin strip of irrigated land surrounded by desert. San Diego and the Golden State's prosperous coast lie only 100 miles away across a jumble of mountains, but it might as well be another world.

Yet this overlooked moonscape may hold the key to America's clean-car future. Hot brine trapped beneath the desert floor contains potentially one of the world's biggest deposits of lithium. Demand for the metal is soaring as automakers worldwide shift to electric cars powered by lithium-ion batteries. Most of that lithium now comes from Australia, China, and South America. The U.S. badly wants its own supply.

There's no doubt the lithium is there. The brine containing it already flows to the surface day and night through a series of 11 geothermal power plants, clustered around the southeastern edge of the Salton Sea. The plants, operating for decades, convert the 500F water into steam to generate electricity. All that's needed is a way to strip out the lithium before pumping the rest of the brine back underground. A March 2020 report from research organization SRI International estimated that the Salton Sea area could produce 600,000 tons of lithium a year, almost eight times last year's global production.

But it's one thing to extract lithium from the region's brine as a test and another to do so in bulk, at a reasonable cost. "This is not alchemy," says Jonathan Weisgall, vice president for government relations for Berkshire Hathaway Energy Co., which owns 10 of the region's geothermal plants. "The lithium's there, and we have recovered it in the laboratory. The question is, can it be done in a commercial way?"

Deep-pocketed Berkshire is one of three companies developing facilities to pull lithium from the brine. Elsewhere in California, mining giant Rio Tinto Group has been pulling the metal from old mine tailings. Tesla Inc. has announced plans to produce its own lithium from Nevada clay—something never done at commercial scale. Six years ago startup Simbol Materials LLC claimed to have cracked the code at its Salton Sea demonstration plant, attracting a $325 million buyout offer from Tesla, the *Desert Sun* newspaper reported. The deal didn't go through, and Simbol collapsed in 2015, shuttering its plant.

California officials, who have spent years studying the idea, don't merely see Imperial County as a glorified mine. The lithium, they say, could become the foundation of a local market that could make the U.S. a force in a battery industry that China dominates. They want as many future jobs to be clustered in California as possible. They've even started using the name "Lithium Valley" to brand the idea. Because the lithium is there, they reason, why not make the batteries there, too, at factories powered by clean geothermal energy? And if the batteries are made there, why not the whole electric car? "The infrastructure is there, the workforce is there," says Rod Colwell, chief executive officer of Controlled Thermal Resources Ltd., which plans to build a new geothermal plant complete with lithium extraction at the lake. "If we manage to snag one battery plant, you're talking 3,000 jobs. That's a big deal for Southern California."

It would be a bigger deal for Imperial County, where even before the coronavirus pandemic the unemployment rate often ran to 15% or 20%. The county, 85% Latino, suffered one of the state's worst Covid outbreaks this summer. Its two hospitals were so overrun that some

The Alamo River on the U.S. side as it begins its journey to the Salton Sea

patients were airlifted 500 miles away to San Francisco. "This pandemic has only uncovered what many people were not aware of," says state Assemblyman Eduardo Garcia, who grew up in the area and now represents it in Sacramento. "We who live here and have been living with the economic challenges have been ringing the bell for years now."

Governor Gavin Newsom in September signed a bill written by Garcia creating a committee to explore how best to develop the county's lithium resources. Garcia calls the opportunity a "Wayne Gretzky moment," citing the hockey great's famous method of skating to where

DEBBIE BENTLEY (2)

he thought the puck was going to be. “You can say this is where the puck is going, in terms of our need for lithium batteries and the electrification of our nation,” Garcia says.

The Imperial Valley straddles the Mexican border. In 1905 the levee of an irrigation canal bringing water from the Colorado River about 60 miles to the east burst open. Water poured into a depression in the desert, the Salton Sink, creating a lake whose surface lies more than 200 feet below sea level. It’s slowly drying and shrinking, growing saltier by the year. Pesticides from irrigated fields nearby settled in the lake bed and now sit exposed to the winds, to be swept aloft during dust storms.

Beneath the lake, a bubble of magma—partially molten rock—heats the water that the geothermal plants use. That water, far from pure, holds a sizable chunk of the periodic table. When the power plants were built in the 1980s, no one gave the lithium much thought; the first commercial lithium-ion batteries didn’t hit the market until 1991.

The plants at the Salton Sea draw their superheated brine from wells thousands of feet deep, let it turn to steam inside the plant, use the steam to turn turbines and generate power, then pump it back underground to reheat. Removing the lithium before reinjecting the brine would add a few steps to the existing cycle, giving the plants a new product worth far more than the electricity they sell.

It’s not easy to extract commercial quantities of lithium from the brine, which is packed with potassium, iron, manganese, and sodium. In part that’s because lithium and sodium atoms behave similarly, says David Snydacker, founder and CEO of Lilac Solutions. His startup in Oakland, Calif., has developed its own version of ion-exchange technology—the same concept behind water softening—that uses ceramic-based beads to collect the lithium, without the impurities. Lilac in February won $20 million in funding from investors including Bill Gates’s Breakthrough Energy ventures (Michael Bloomberg, founder and majority owner of Bloomberg LP, which owns *Bloomberg Businessweek*, is an investor in Breakthrough Energy), and Controlled Thermal Resources plans to use Lilac’s technology at the Salton Sea.

“Lithium is particularly hard to separate,” Snydacker says. “If you tried to use conventional exchange technologies, you’d just end up with a lot of sodium.”

Each company with projects at the lake—Controlled Thermal Resources, Berkshire Hathaway, and EnergySource Minerals LLC—has its own approach to the technology, and each insists reaching full-scale production won’t require further breakthroughs. The pandemic came at an awkward time, when the companies had intended to be finalizing plant designs and raising money.

Bombay Beach on the Salton Sea. Even before the pandemic, unemployment in Imperial County typically ran 15% to 20%

EnergySource, whose sister company operates one of the area’s existing geothermal plants, needs about $400 million for its facility, says Chief Operating Officer Derek Benson. The company expects to begin construction in a year or so and enter production in late 2023. It’s been running a pilot project at its plant, off and on, for about four years, he says. The full-scale facility would yield a little less than 20,000 metric tons of lithium per year.

If the plants open as planned and work as advertised, California officials anticipate parlaying them into something far bigger. With its eco-conscious population and aggressive climate change policies, California has become home to half of all electric vehicles sold in the U.S. Despite its reputation as an expensive place to build anything, the state boasts a growing number of EV manufacturers, including Tesla and would-be rival Lucid Motors, Zero Motorcycles, and bus maker Proterra. Creating a battery manufacturing cluster with Imperial County as its base would help the EV makers thrive, lure investment from Detroit as U.S. automakers shift to electric transport, and bring good jobs to a corner of the state that desperately needs them. “California has some of the highest standards of labor relations and environmental regulations,” Assemblyman Garcia says, “so we really want to tout the idea that we’re going to do it, and we’re going to do it right.” —*David R. Baker*

THE BOTTOM LINE California officials say one of the poorest parts of the state could turn into a giant source of lithium for electric cars—and they won’t have to tear up the earth to get it.

Lidar Makers Lower Their Sights

With full autonomy a long way off, they focus on adding features to ordinary cars

As timelines for fully self-driving cars stretch into the next decade, makers of lidar—the laser sensors critical to autonomous technology—are pitching automakers on using it for advanced driver assistance systems (ADAS), such as hands-free driving on the highway. For startups such as Innoviz Technologies, Luminar Technologies, and Velodyne Lidar, the more gradual approach to autonomy is potentially a more lucrative one.

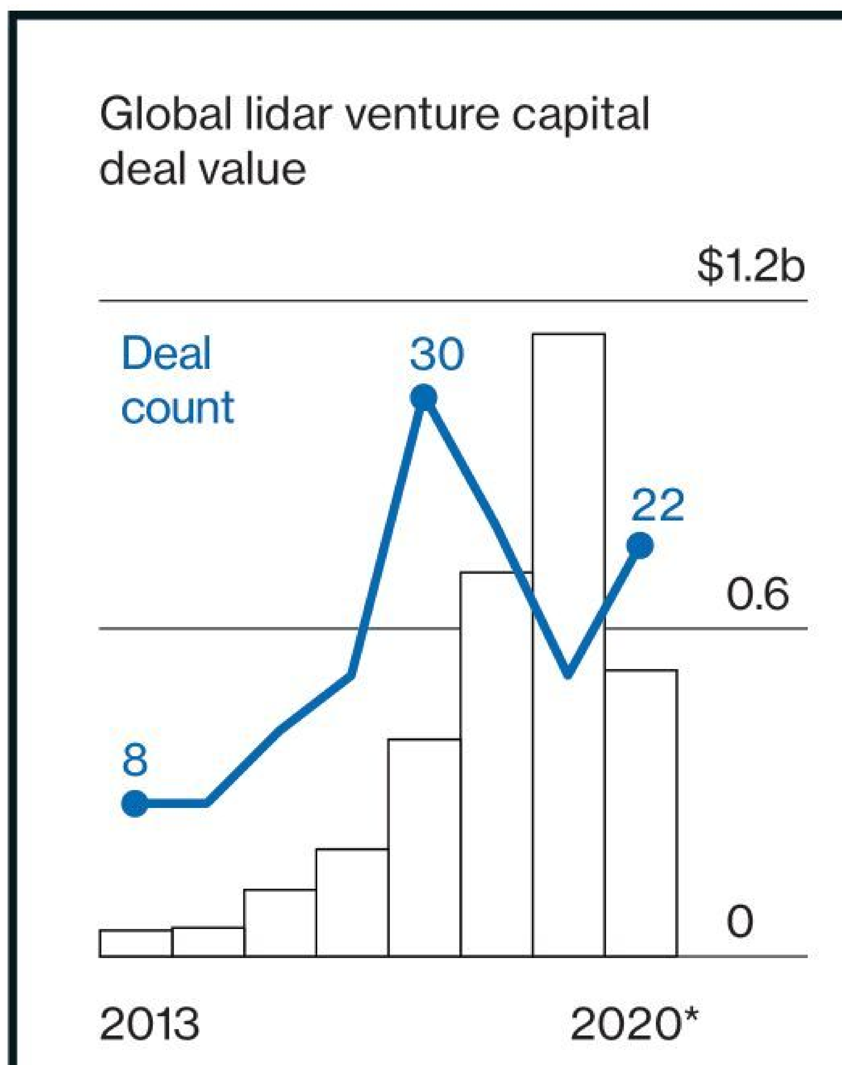
Luminar has struck deals with Volvo Car and Daimler Truck. Innoviz's technology will be in BMW's iX, an electric SUV expected to go into production in 2021. The lidar companies have brought down the cost of their sensors, among the most expensive components of autonomous vehicles (AVs), to make the technology practical for mass car production.

Velodyne Lidar and Ouster, founded by a veteran of troubled lidar startup Quanergy Systems, are also pursuing markets with less rigorous safety requirements than passenger cars, including drones and industrial robots, such as automated forklifts. For Velodyne Lidar Inc., driver-assist systems represent about 35% of the projects it's won or hopes to win in the next five years, whereas AVs and industrial robots make up about 20% each.

It's not yet clear if these pivots are enough to sustain the startups, but the promise of delivering self-driving technology to conventional passenger cars has allowed them to raise hundreds of millions of dollars in fresh capital. Some are going public in deals with special purchase acquisition companies, or SPACs. Velodyne completed such a reverse merger in September with Graf Industrial Corp. Luminar Technology Inc.'s 25-year-old founder and chief executive officer, Austin Russell, is set to become one of the world's youngest billionaires when the company completes a $3.4 billion reverse merger later this year.

"It will likely take hundreds of thousands of vehicles to enable autonomy," Russell wrote in a letter to investors in October. "That scale is exactly what we can deliver with series production on consumer vehicles."

Innoviz, an Israeli venture backed by auto suppliers Aptiv Plc and Magna International Inc., is pitching its latest software and sensors as a better way for carmakers to develop self-driving tech. The startup builds on data collected from consumer vehicles. The lidar it will supply for BMW AG's iX will gradually introduce so-called Level 3 autonomy, meaning drivers can take their hands off the wheel and eyes off the road in limited contexts.



Tesla, whose CEO, Elon Musk, famously dismisses lidar, rolled out a beta version of what it calls full self-driving to select customers in October. Despite its name, the system, which costs $10,000, doesn't offer full self-driving. FSD's terms of service states drivers must be prepared to take control of their car and leaves them liable for collisions.

The market for lidar sensors in light-duty vehicles could reach $46 billion in sales by 2030, with much of that going to enable partial autonomy, says Sam Abuelsamid, principal analyst with research company Guidehouse Insights.

The only way for lidar startups to make money in the transportation sector now is through ADAS, says Grayson Brulte, who runs a consulting company in Palm Beach, Fla., focused on autonomous vehicles. "As higher levels of autonomy mature," he says, "then you can start to have that additional revenue growth." —*Gabrielle Coppola*

THE BOTTOM LINE Lidar makers have been attracting fresh capital as they work with automakers to introduce limited autonomous features. The pivot will potentially be more lucrative for these startups.

COURTESY VELODYNE LIDAR (2). *AS OF NOV. 13. DATA: PITCHBOOK

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WHO'S a good business model?

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Yes it is!

You're *SUCH* a good business model!

Yes you *are!*

Locked-down Americans are pampering their pets like never before, and Chewy is reaping the benefits

By Anders Melin and Bryan Gruley Photographs by Devin Christopher

D, companion to Chewy
CEO Sumit Singh

The usual suspects topped the list of the best-paid executives in the U.S. published by Bloomberg News in July. No. 1 was Tesla Inc.'s Elon Musk, with a 2019 payday of nearly $600 million, followed by Apple Inc.'s Tim Cook at $134 million. The top 10 also included bosses at Intel, Alphabet, and Blackstone Group.

The list did contain one surprise: At No. 5 stood one Sumit Singh, chief executive officer of Chewy Inc., an online retailer of food, toys, apparel, and medicine for pets. Singh joined Chewy in 2017, was elevated to CEO after seven months, and in 2019, his first full year on the job, earned $108.2 million in salary, bonus, and stock grants. That sum was even more remarkable given that Chewy, in nine years of existence, has yet to post a profitable quarter.

But Singh's haul is another indicator, among many, of the company's rise as a force in e-commerce. In the fiscal year ended Feb. 2, it sold products to 13.5 million customers, up 27% for the year, while revenue jumped 37% to $4.9 billion. Then came the coronavirus, and things for Chewy got even better.

About two-thirds of U.S. households have pets, and their coddling owners—"pet parents," as Chewy calls them—will spend a record $99 billion on them this year, according to the American Pet Products Association. With these pet moms and pet dads avoiding walk-in stores and animal adoptions soaring in many places, Chewy's business has boomed. From February to July, the company added more customers than in all of fiscal 2019. Its shares, which traded at about $30 early this year, shot up to $72 in October, valuing Chewy at almost $30 billion.

Even the most lovable pet can soil the carpet, though, and there's been a whiff of unpleasantness at Chewy. Since PetSmart Inc. bought it for $3.35 billion in 2017, the founders and several executives have departed, partly over disagreements about Chewy's culture and direction. A last-minute rewrite of pre-IPO equity awards rankled some at the company, who griped that Singh didn't deserve to stand with Musk and Cook.

In some ways, Chewy is reminiscent of a young Amazon .com Inc., with a ferocious focus on long-term growth at the expense of short-term profits. "To me, the story of Chewy is one of taking a beautiful startup and scaling it to become a world-class institution," says Singh, himself an Amazon alumnus. "I believe that we have a clear path to profitability in the not-so-distant future. So we're building something amazing here."


D with Singh

The New York Stock Exchange opening bell rattled Theo, the white labradoodle reluctantly occupying the exchange's famous podium on June 14, 2019. A Chewy executive cradled the dog and patted him on the back. The company's shares were about to start trading. Singh beamed as he clanged the bell.

Watching from the exchange floor were Ryan Cohen and Michael Day, friends who co-founded Chewy in a dingy North Miami Beach office in 2011. The night before the IPO, Cohen had sat on the street outside the exchange, talking on the phone with his father and weeping about his baby becoming such a success. Neither he nor Day were with the company or owned a single share anymore. "It was surreal," Cohen recalls. "It really was the American dream."

Ten years ago, he and Day were twentysomethings with a knack for writing code and using Google AdWords to sell stuff. They'd met in a chatroom and decided to start an e-commerce business. Teaming up with Alan Attal, a friend of Cohen's, they settled on jewelry.

Then, shortly before the launch, Cohen had an epiphany while shopping for his teacup poodle, Tylee, at his neighborhood pet store: They should ditch jewelry and start a pet food retailer that could marry low prices and fast shipping with the expert service offered in a local shop. Attal, who had a Chihuahua named Ruby, and Day concurred. In June 2011, they launched Chewy, a name Cohen had tested on pet owners in a PetSmart parking lot. Their inspiration and primary rival were one and the same: Amazon.

Skeptics asked whether Chewy wasn't just another Pets.com, the doomed startup that went public in early 2000 and shut down before the year was out. But by 2011 online shopping had become part of everyday American life. There were plug-and-play options for warehousing, shipping, and cloud computing. U.S. households were spending more on higher-quality food and veterinary visits for their pets, which they increasingly considered part of the family.

Chewy was determined to outdo Amazon in serving customers. When a customer phoned, a representative said hello within six seconds. Emails were answered within an hour. Messed-up orders were replaced without question or cost. Customers received greeting cards on their pets' birthday and flowers when their pets passed away. Those who emailed pet pictures were sent free hand-painted portraits. "It was all from the beginning about wowing customers," Cohen says. "We can surprise the customer with a portrait, and all of a sudden they're a customer for life."

By early 2012, Chewy was posting monthly sales in the range of $1 million, which would grow in under two years to more than $10 million. Still, investors remained dubious. Cohen went door-to-door in Silicon Valley without raising a penny of venture capital. Then, in September 2013, Larry Cheng, co-founder of Volition Capital and owner of a labradoodle named Coco, agreed to invest $15 million. "Chewy was the great untold story," Cheng says. "Back in that day, people were talking about Casper and Warby Parker, and we all knew Chewy was doing way better than all those companies."

Chewy's path to success was all about scale: getting big as fast as possible. "If we were going to be able to survive Amazon, we needed to build a larger pet business than they did," Cohen says. Chewy spent heavily on AdWords and, later, on television and direct mail to attract customers. Some companies will pay suppliers upfront in exchange for a price discount; Chewy, following Amazon's lead, chose instead to pay full price a few weeks later—gaining, in effect, a short-term, interest-free loan it could plow into customer acquisition. As long as new customers kept shopping—and even, in many cases, subscribed to regular, periodic purchases of food and other staples—the model worked.

Chewy's existing customers generated a profit. But that income was funneled directly into attracting new customers, which consistently led to financial losses. The approach was a facsimile of Amazon's vaunted "flywheel" model for growing. By 2016, Chewy was averaging $2.5 million a day in sales, for an annual take of $900 million. Never mind that it lost $107 million that year. At any point, Cohen says, he could have turned off the marketing spigot, and Chewy would have become profitable. But it would be a smaller business today.

Early in 2017, Cohen became a father for the first time, and his own father suffered a major heart attack. The latter event "really shook me to my core," he says. Around the same time, he received an email from Raymond Svider, chairman of BC Partners, a private equity firm in London. Two years earlier, BC had bought PetSmart, which had 1,400 stores in the U.S. PetSmart executives had noticed Chewy eating into their market share, and Svider, who owns Siberian cats named Pearl and Cashmere, was now interested in buying the startup. Cohen told him he was plotting an IPO, but he'd consider an all-cash bid if it came fast. That April, BC and PetSmart agreed to buy Chewy in what was then the biggest e-commerce deal ever. Cohen and his co-founders each pocketed hundreds of millions of dollars.

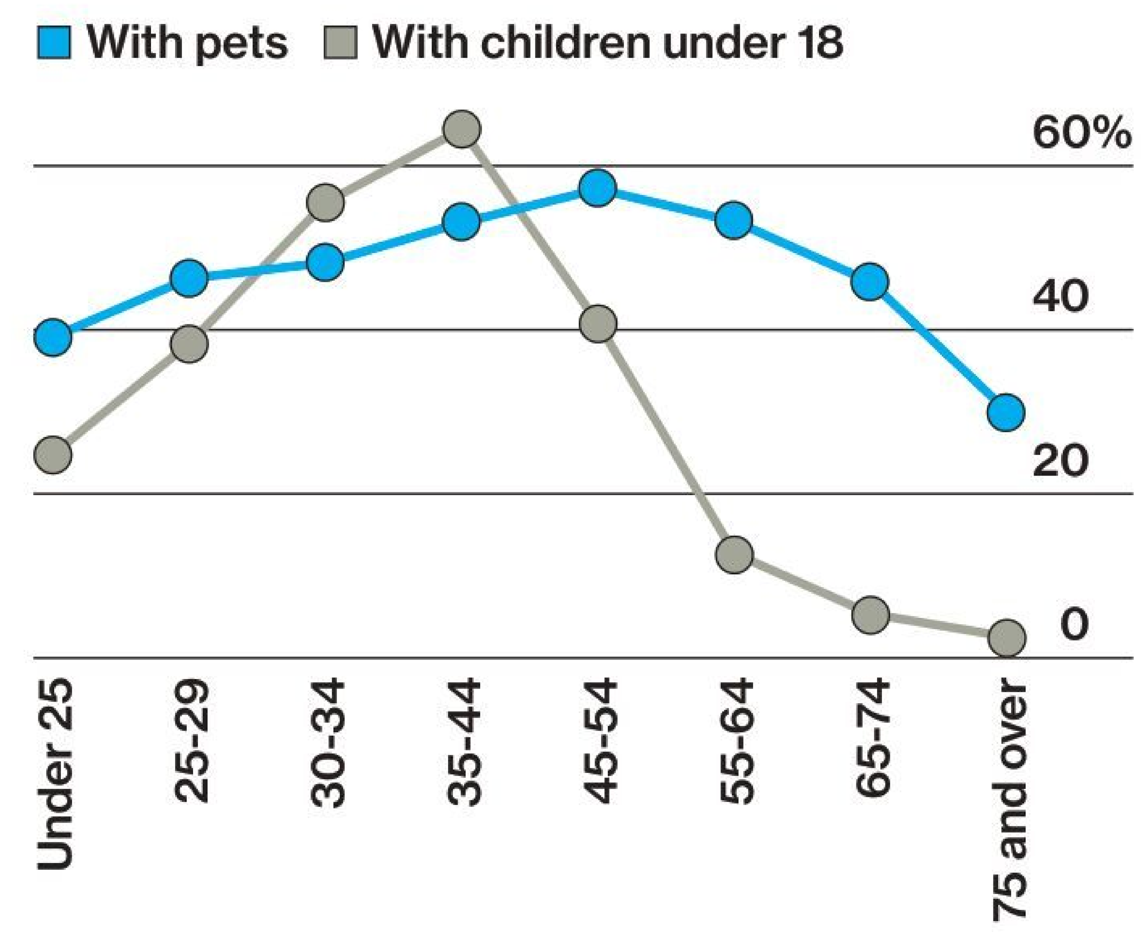
As part of the deal, Chewy's executives and some senior employees got golden handcuffs: "profits interest units," a type of equity that was set to vest over five years. If a recipient left Chewy before the end of May 2019, BC could buy back his or her securities at a fraction of their value.

Late one evening in March 2018, Cohen sent an email announcing his immediate resignation. The news came as a surprise, though a few of his colleagues were aware that Cohen was frustrated with the new owner's questioning of some of his decisions, according to former executives.

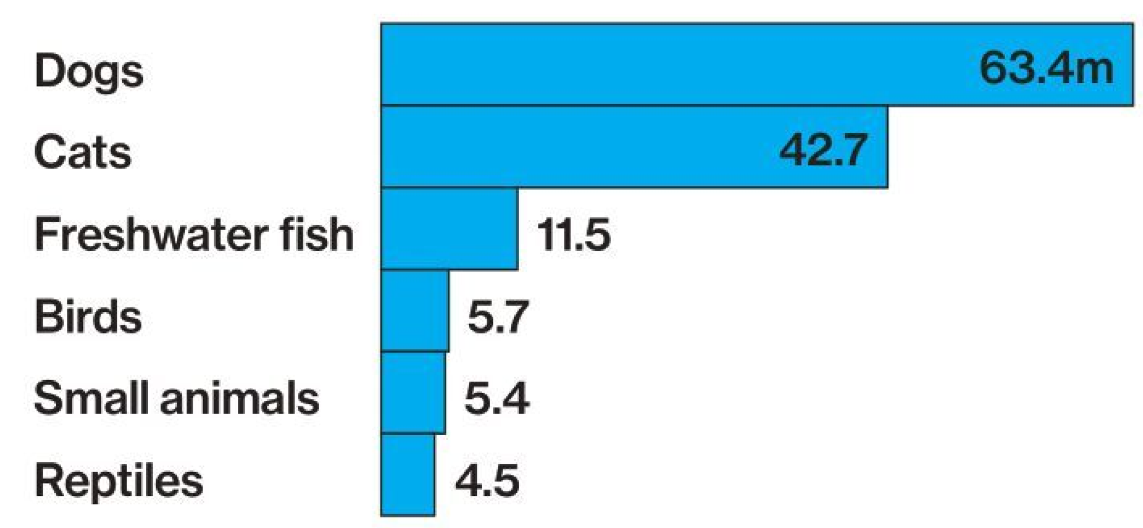
Cohen later wrote in *Harvard Business Review*, "I felt I had done all I had set out to do…and I didn't want a boss." He did want to spend more time with his new son and with his father, who died last December. Singh, ▶

Americans and Their Pets

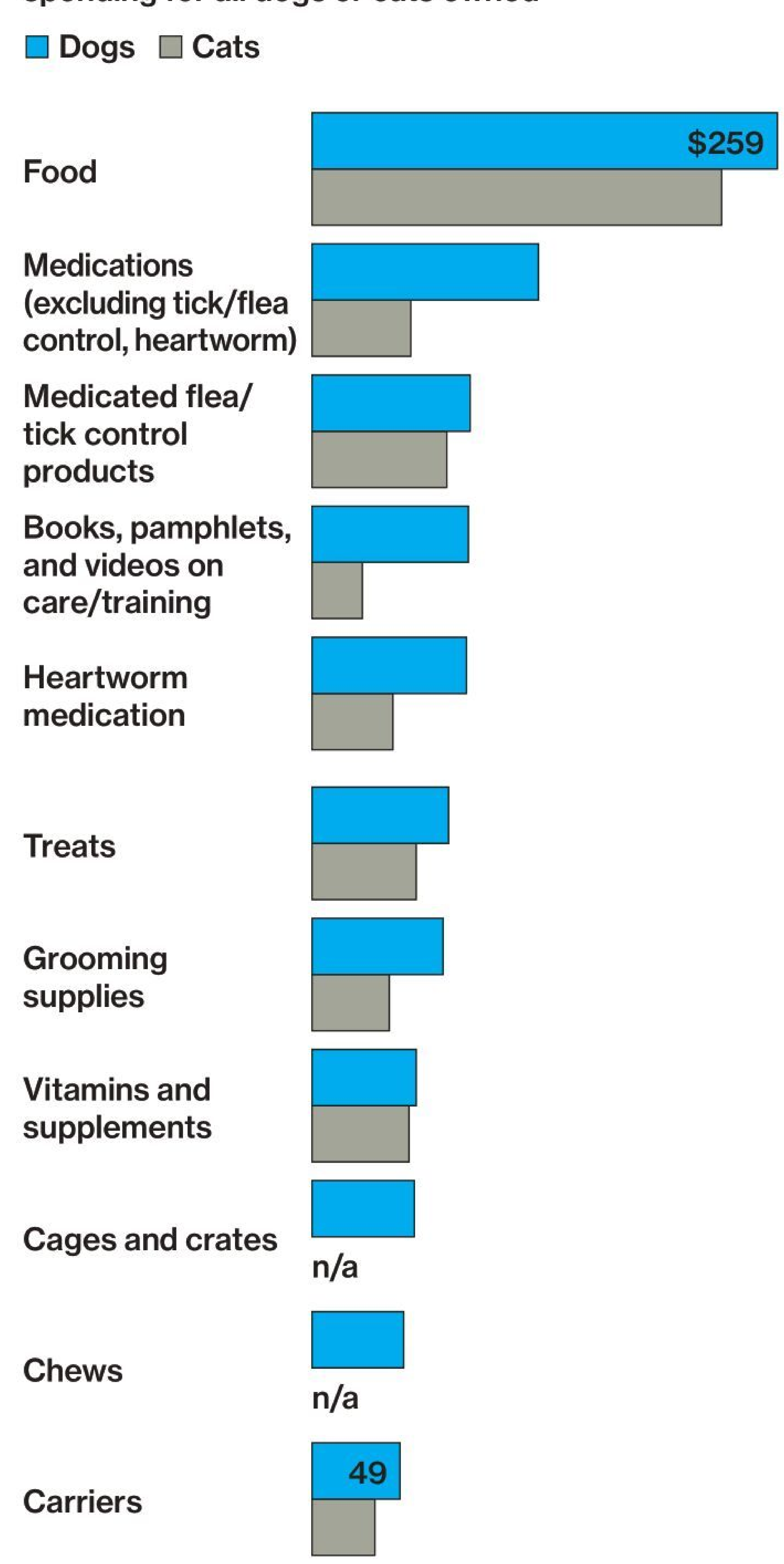
Share of U.S. households, by age of head of household



U.S. households with at least one pet, by type of pet



Major pet supply categories, average annual owner spending for all dogs or cats owned



DATA: AMERICAN PET PRODUCTS ASSOCIATION, AMERICAN HOUSING SURVEY 2017

◀ who'd been hired by Cohen as chief operating officer less than a year before, was named the new CEO.

When Singh, who owns a Shih Tzu named D, took over, the company counted 10,000 employees. Cohen had laid out a step-by-step plan for board members for achieving profitability in a few years, according to internal company documents reviewed by *Bloomberg Businessweek*. Sales of private-label products, which carry higher margins than third-party brands, were growing. A pet health-care and pharmacy business was almost ready for launch, and the company had laid groundwork for an IPO.

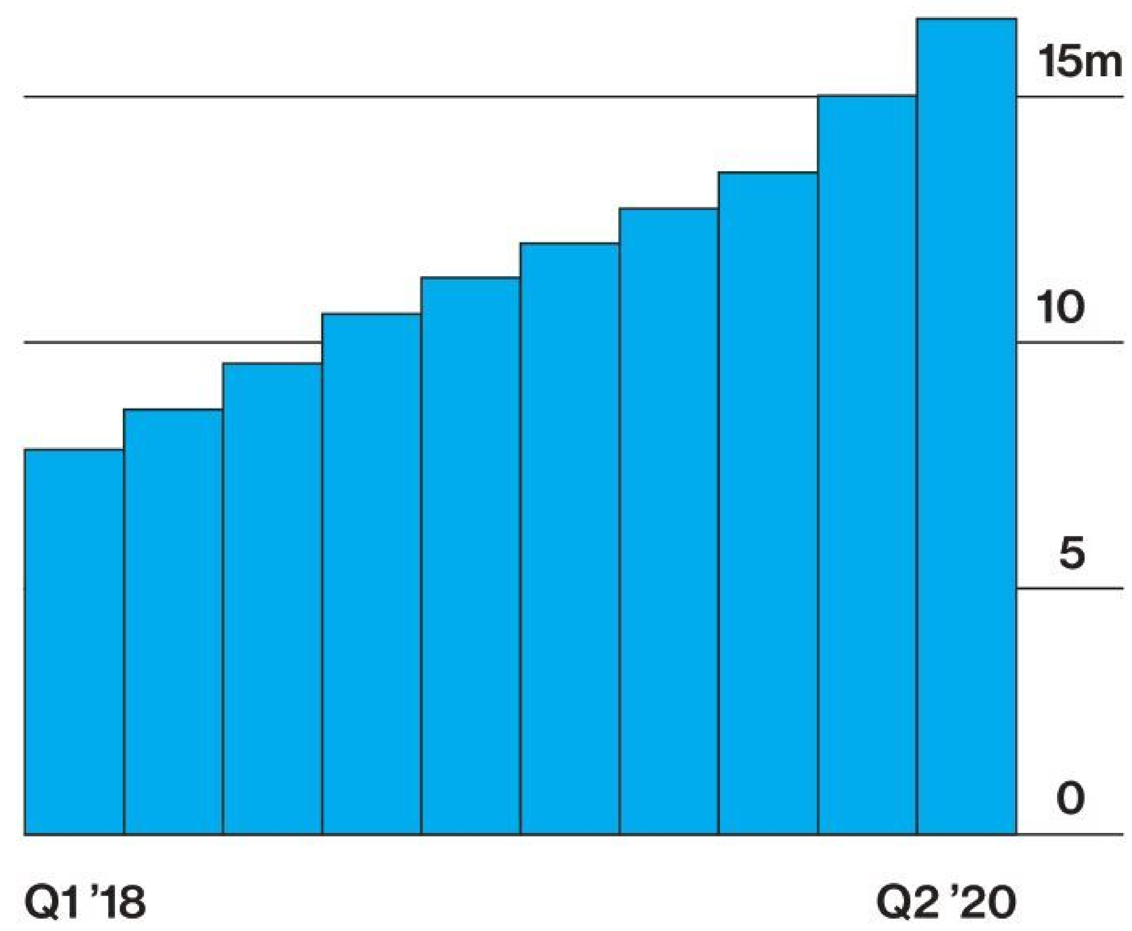
But as Singh saw it, Chewy needed more structure, better data analytics, a greater product assortment, and stronger inventory and supply chain management. Despite the plan prior management set out, Singh says, "there wasn't a road map for sustained growth. How do you take the company from $2 billion to $20 billion?"

Singh, who grew up in India, has a master's degree in engineering from the University of Texas and an MBA from the University of Chicago. After 10 years with Dell Technologies Inc., he helped build Amazon's grocery-delivery business in the U.S. and three other countries. Those who interviewed him to be Chewy's operating chief saw a brainy data geek with a strong background in operations and experience working at large organizations.

Singh improved Chewy's automated forecasting and supply chain management with machine learning and expanded a tech-centric office in Boston. The company's product catalog increased by more than half, to 67,000 items. Again mimicking Amazon, Singh banned PowerPoints and told staff to argue their cases in narrative prose. He also identified key metrics and held executives to them during weekly, monthly, and quarterly reviews. "It's a relentless focus on data and experience that allows us to do hard things well," he says.

Last year, Singh learned that Chewy

Chewy customers



DATA: COMPANY FILINGS

was getting a disproportionate number of complaints about cat litter boxes being damaged in delivery. Cat litter is heavy, and a small problem can make a big mess. But customers need to reorder it periodically, fitting with Chewy's focus on recurring purchases. A small team at Chewy gathered data and tracked down the warehouses, delivery routes, and ZIP codes with the most botched deliveries. The team worked with suppliers to create better packaging, set up fulfillment-center prep stations for packages prone to sustaining damage, and took other steps to reduce the likelihood of problems in transit. "If you're living in New York on the 36th floor, and your cat litter came open on your expensive hardwood floor, you're never going to order from me again," Singh says.

Some longtime employees struggled to get along with the new boss. The abundantly confident Singh struck a different chord than Cohen, an unassuming Canadian who'd never worked at a big company before founding Chewy. Singh personally involved himself in matters Cohen had delegated, and he encouraged executives to openly challenge each other during meetings, which some say created an atmosphere of competition that made some employees reluctant to speak up. His apparent obsession with data, big meetings, and Amazonian "six-pager" memos grated on some underlings, particularly those who'd joined Chewy because the founders' scrappy, just-get-it-done approach wasn't like that of a large corporation. "We all knew we were just a pet store, but we really believed we were making a big difference in the lives of pets and people," says Andrea Wolfe, Chewy's former vice president for marketing, who left in late 2017. "It was more than just meeting numbers and building efficiency. With Sumit, you could tell he was just a numbers guy."

In Singh's view, it's all a necessary part of getting bigger. "As Chewy continues to scale, it is critical to combine our spirit of innovation with data and insights," he says. "We believe that practices like metrics and data have made us better, faster, and more scrappy." This approach, Singh says, allows the company to automate routine tasks and shorten meetings, and promotes critical thinking.

Early in his CEO tenure, Singh questioned a number of practices that had been fundamental to Chewy's success. For instance, in the summer of 2018, Amazon rolled out a 40% discount for new customers placing subscription orders for pet products, besting Chewy's standard 20% markdown. Singh resisted immediately matching the deal, even as his lieutenants argued that the company's growth stemmed in part from its commitment to having the lowest prices. Singh suspected customers valued the subscription service enough that they didn't need a big price cut. After a weekslong analysis and debate, Chewy eventually installed a discount of 30%.

A year after Singh became CEO, Chewy prepared to go public. The profits interest units that senior employees had received when PetSmart bought Chewy were scheduled to be 40% vested at the end of May. But Singh told employees the units were being canceled because of the impending June IPO. The value of the units was tied to how much Chewy and PetSmart would have been worth if they went public together; that no longer applied, because PetSmart wasn't participating in the IPO. The employees instead received restricted shares in Chewy, only 10% of which would be vested when the company went public. Yet when Chewy's registration statement became public, it showed that Singh's award had its own vesting schedule: He could pocket 25% of his shares on the day of the IPO.

In an internal email reviewed by *Bloomberg Businessweek*, Singh told his team he'd fought "very hard" for them in negotiations with Chewy's controlling shareholder, BC Partners. He also said his own vesting was justified: The payout depended on factors beyond his control, such as the stock hitting certain price thresholds. But other executives' payouts were tied to the same benchmarks. The company says the new plan "has generated exponential returns" for shareholders and employees alike.

On the day of the offering, Chewy's shares jumped 59%, to $35, temporarily ballooning the paper value of Singh's equity award to $139 million. (Chewy says Bloomberg's calculation of Singh's 2019 compensation is inflated, because it includes shares that have yet to vest.) The shares slid back and hovered at about $30 until the coronavirus invaded the U.S.

Singh was attending his daughter's school fair on Feb. 29 when he took an urgent call from his chief supply chain officer. Customer demand had spiked over the past two days, even though Chewy wasn't running special deals. "OK," Singh says he thought. "Something is about to break loose."

Over the next few weeks, inventories that were normally 99% stocked suddenly declined by as much as 23%. It was like the holiday season had arrived unannounced. "Our backlog levels were higher," Singh says. "Our customer service levels started degrading."

Grooming products, for example, were in especially heavy demand, because groomers had closed their doors and owners were opting to wash and clip their pets themselves. Lucky for Chewy, it had stocked up in late 2019 to prepare for the Chinese New Year in January, when factories in China that supply those and other goods would shut down. Chewy also regularly reserves ample stocks for its subscription, or autoship, clients, which effectively shielded about two-thirds of the company's business from acute shortages. Algorithms were tweaked so customers could more easily find different brands and sizes if their preferred choices weren't available; that had the added benefit of attracting fresh eyes to Chewy's private-label offerings. The company also created a free online chat service that connected autoship customers with veterinarians.

Tylee, an inspiration for Chewy, with company co-founder Cohen

Shipping was "the monster," Singh says. The company might have something a customer wanted, but in a warehouse on the other side of the country. During April and May, deliveries were taking as long as nine days. Chewy started splitting orders into multiple boxes, using express shipping, and taking other measures; the added cost was about $20 million. All of this was done to protect the company's relationships with customers, Singh says. It worked. When new ones complained on Facebook, long-time customers jumped to Chewy's defense.

Six thousand workers joined Chewy this spring. The company says it temporarily increased wages and benefits to attract new people, most of whom were deployed in the warehouses. Some shifts doubled in size.

Chewy projects its sales for the current fiscal year will approach $7 billion—up more than 40% from 2019 and about what Cohen forecast before he left. The obvious question is when Chewy will turn a bottom-line profit. In an email to *Bloomberg Businessweek* addressing that, Singh attached a photo of a diagram he'd drawn on a whiteboard with blue and red markers. A big circle labeled "growth and profit flywheel" illustrated the cycle of existing customers generating cash to lure new ones and expand offerings. An arrow pointed to a word in red: "PROFITABLE!!"

It doesn't indicate when, but Singh says the company is on its way. The cost of marketing relative to revenue has been falling, the private-label and pharmacy businesses are thriving, and Chewy has said it could post a profit for fiscal 2020 of as much as $20.4 million, albeit without counting charges for interest, taxes, depreciation, and amortization. That would presumably be good for shareholders, including Singh. As of Nov. 16, his equity award had swelled in value to $256 million. Ⓑ

A PRIN

PRINCE ANDREW was an unofficial door opener for David Rowland and his private bank

FINAN

ROWLAND made a fortune in real estate and lending to clients who might have trouble borrowing elsewhere

AND A

PRIVATE BANK

BANQUE HAVILLAND is being investigated by prosecutors in Luxembourg

ICE, A NCIER... VERY

Prince Andrew's friendship with David Rowland gave cachet to Banque Havilland, a Luxembourg lender that wooed sketchy clients in high places

By Gavin Finch and Harry Wilson

ROWLAND: DAVID PARKER/ANL/SHUTTERSTOCK. BANK: MAURICE SAVAGE/ALAMY. PRINCE ANDREW: STAR MAX/AP PHOTO

It isn't much fun these days being Prince Andrew, eighth in line to the British throne. Last year he was grounded by his mother, the queen, after a disastrous TV interview about his links to the late money manager and convicted pedophile Jeffrey Epstein. The prince rarely leaves the confines of Windsor Great Park, where he lives in a 30-room house, and he hasn't made a public statement in months. When he does communicate, it's through lawyers sparring with U.S. prosecutors who want to question him.

But Epstein is only the most infamous wealthy financier the prince has had dealings with. There's another one the public knows less about. For years, Andrew acted as an unofficial door opener for David Rowland and his private bank in Luxembourg, Banque Havilland SA, according to a trove of emails, internal documents, and previously unreported regulatory filings reviewed by *Bloomberg Businessweek*, as well as interviews with 10 former bank insiders. His royal cachet and his role as the U.K.'s special representative for international trade and investment until 2011 helped the Rowland family pitch their services to potential clients from the ranks of the world's dictators and kleptocrats.

Then in 2011 a photograph published in the *Daily Mail* drew unwanted scrutiny. It showed the prince with his arm around a young woman in Epstein's entourage as Ghislaine Maxwell, Epstein's former girlfriend and alleged co-conspirator, looked on. Andrew would later claim that the photograph may have been doctored, but the image came at a bad time for the Rowlands: Jonathan, David's son and Banque Havilland's then-chief executive officer, was planning a trip to Cameroon, Equatorial Guinea, and Gabon to scout for business, and he wanted Andrew to join him.

The previous year the Rowlands had accompanied the prince on an official visit to China, where Andrew had given them access to some of his meetings. In other countries and on other occasions, they introduced themselves as investment advisers to the prince and the royal family when wooing clients. But Andrew never went on that trip to Africa. "Disappear for a while," Jonathan advised the prince in an email obtained by the *Daily Mail*, which has reported on some aspects of Andrew's dealings with the Rowlands.

"We are business advisors to HRH and travel with him"

Andrew's relationship with the family was mutually beneficial. It afforded him a lifestyle beyond the reach of his reported $320,000 annual stipend, including trappings such as the use of the Rowlands' $45 million jet. He had a private bank account at Banque Havilland and a credit card in the name of Andrew Inverness, a pseudonym that's an apparent nod to one of his many titles, Earl of Inverness. For the Rowlands, Andrew's involvement brought some class to a tiny financial institution they'd purchased on the cheap in 2009 from the ruins of Iceland's Kaupthing Bank.

They rechristened it after Havilland Hall, David Rowland's estate on Guernsey, a tax haven in the Channel Islands, and settled on an unusually bold business model. Most banks have become increasingly selective about their clients to avoid running afoul of anti-money-laundering rules. Governments on both sides of the Atlantic require them to vet the sources of their clients' wealth, monitor their transactions, and report any suspicious activity—with more stringent checks for those who hold prominent public positions. But the picture of Banque Havilland that emerges from the documents and interviews is of a bank willing to work with people most other financial institutions would shun.

There was Kolawole Aluko, an energy magnate who got a €25 million ($30 million) loan at a time when he was the subject of media reports about a bribery scandal in Nigeria's oil industry. Joshua Kulei, the personal assistant to former Kenyan President Daniel Arap Moi, received a £2.2 million ($2.9 million) mortgage despite being banned from the U.S. because of graft allegations he's denied. And a company controlled by the heirs of deceased Georgian businessman Arkady Patarkatsishvili borrowed more than $5 million from the Rowlands. The money was routed through one of their accounts at the bank, over objections from a senior compliance officer who described Patarkatsishvili, in emails to Jonathan Rowland and other bank executives in 2010, as an alleged criminal and his money as tainted.

The emails don't connect Andrew to any of these clients, and it isn't known whether the Rowlands mentioned him in the course of these dealings. A Buckingham Palace spokeswoman, regarding the prince's former role of special trade representative, says that "the aim, and that of his office, was to promote Britain and British interests overseas, not the interests of individuals." She didn't respond to specific questions about his relationship with the Rowlands or Banque Havilland.

A spokesman for the bank says that none of its current or former clients had been introduced or referred by Prince Andrew, that it had never employed him, and that he was never "a paid advisor or ambassador." The spokesman also says that "compliance with legal and regulatory requirements are the foremost priority" and that the bank had "never extended a loan where it has received the explicit objection to proceed of its compliance officers." David Rowland declined to comment. Jonathan, now a nonexecutive director of a small bank in the U.K., said in an email that he has never been censured or criticized by a regulatory body, and that he has been approved by U.K. regulators to be a director and owner of a bank.

The prince and the financier were an odd pair. David Rowland is 75, the son of a London scrap-metal dealer. He

THE PRINCE visited Azerbaijan often and met more than a dozen times with President Aliyev

dropped out of school at 16. Short and barrel-chested, with a near-permanent scowl, he peppers his speech with expletives. He's said he made his first million pounds in his 20s, buying and selling real estate. He moved on to shipping, timber, and chemicals, eventually setting up a company called Blackfish Capital Management, which he claimed managed $1 billion of his own money and that of his friends.

Through Blackfish and other entities, Rowland made loans to clients who might have had trouble borrowing from big banks. He sometimes charged annual interest of more than 10% and demanded collateral two or three times the value of the underlying loan, according to people with knowledge of Blackfish's business. He parlayed his financial success into political capital, contributing more than £4 million to Britain's Conservative Party in the two years after buying Banque Havilland, making him one of its biggest donors. David Cameron, prime minister at the time, named Rowland the party's treasurer, its chief fundraising position, but he resigned before assuming the post when articles came out about his business dealings and offshore tax status.

Andrew, 60, came from the other side of the realm: born in Buckingham Palace, baptized by the Archbishop of Canterbury, and raised by a governess. He stood little chance of ascending to the throne; he also didn't have much appetite for school. After joining the Royal Navy at 19, Andrew served as a helicopter pilot during the 1982 Falklands War.

He had a roguish side, too. He liked to party and had a string of girlfriends. A whiff of scandal accompanied him. In 2007 he sold a home his mother had given him to a Kazakh businessman for £3 million above the asking price. More recently he's been embroiled in a dispute with the former owner of his Swiss chalet over an unpaid portion of the purchase price. His friendships, including with a son of former Libyan leader Moammar Qaddafi, have been a source of annoyance for Britain's diplomats and politicians.

Andrew's relationship with Rowland dates back to at least 2005, when he was the guest of honor at the unveiling of a larger-than-life statue of Rowland at the financier's estate. A photograph from the event shows them standing side by side in tuxedos, Andrew's head thrown back in laughter. They attended each other's parties and met for private dinners. Andrew introduced David to his mother and took him to tea with his brother at the queen's Scottish estate, according to the *Daily Mail*. The Rowlands were regular guests at Andrew's country house, and he'd visit them at Havilland Hall.

A few years after the statue's unveiling, Rowland set up a venture called Inverness Asset Management. It was domiciled in the British Virgin Islands, a former colony that's become an offshore tax haven. Blackfish marketing documents from 2007 describe Rowland as the prince's mentor in business matters and say Andrew owned 40% of Inverness. (A lawyer for Rowland denies that the prince had a financial interest in the company.) Another document shows Inverness had hundreds of thousands of pounds of investments. The prince told Jonathan Rowland in one email that he had proposed using Inverness as a vehicle for Qataris interested in investing in a property company associated with his brother Charles. Inverness was wound down in January 2019.

Whatever David Rowland's intentions were for Inverness, they paled in comparison to his ambitions for the private bank in Luxembourg he purchased for €50 million. The deal transformed him from a scrappy capitalist on the fringes of finance into the owner of a private bank with about 100 employees and €1 billion of assets. Jonathan was given a top executive job, even though he had no banking experience and had left school at 16. (He stepped down in 2013 after a stroke.) Six of his seven siblings would also join the firm. Its new logo featured eight dots around a capital "H"—an echo of the five arrows on the Rothschild coat of arms, one for each brother.

David Rowland took the title of honorary president in 2009, but he's never been a director or had an executive role. He'd bought the bank through a Luxembourg-based company, Luton Investments, which at the time was owned by a company based in Guernsey. That entity was in turn controlled by a series of nesting British Virgin Islands companies, the last of which was half-owned by eight businesses controlled by eight discretionary trusts whose beneficiaries are his children. The other half, and all of its voting rights, are controlled by an entity called Rowland Purpose Trust 2001.

Despite the complex structure, former insiders say there was never any doubt David Rowland was in charge. The plan was to use his network of contacts and family office clients to tap into emerging markets in Eastern Europe, the Middle East, and Asia, offering services to wealthy individuals. They called it their "Very Private Bank," and, like other private banks, it offered to look after investments, suggest trading ideas, and provide basic banking services including checking accounts and mortgages. What set Banque Havilland apart, the former insiders say, was the type of client the Rowlands sometimes pursued.

Luxembourg doesn't have a reputation for being the world's toughest enforcer of money laundering laws. But some of the clients Banque Havilland brought on were so toxic, and its efforts to vet them so lax, that in 2018 the country's regulator alerted prosecutors. That led to a criminal probe, according to ▶

◀ a spokesman for Luxembourg's judicial administration. The matter is currently before an investigative judge, the spokesman says, adding that there's a presumption of innocence in the absence of a final ruling. Among other things, the investigation is looking at the bank's relationship with the political elite of Azerbaijan, say two people familiar with the probe.

Prince Andrew has been a frequent visitor to the oil-rich country, both while he was the U.K.'s trade envoy and after, and met more than a dozen times with President Ilham Aliyev. Aliyev had taken over from his father, a former KGB major general who'd ruled the former Soviet republic for a decade. The younger Aliyev changed the constitution in 2009 so he could be reelected an unlimited number of times, and in 2017 he appointed his wife first vice president.

He's also been accused by human-rights groups of torturing opposition politicians, imprisoning journalists, and rigging elections—a leaked U.S. diplomatic cable from 2010 compared him to a mafia boss and said Azerbaijan was "run in a manner similar to the feudalism found in Europe during the Middle Ages." Aliyev's family and close associates hold assets worth more than $3 billion at eight of the country's biggest privately owned banks, as well as mansions in London, the Czech Republic, Dubai, and Russia, according to the Organized Crime and Corruption Reporting Project (OCCRP). In 2007, Transparency International ranked Azerbaijan among the worst countries—150 out of 179—on its Corruption Perceptions Index.

David and Jonathan Rowland accompanied Andrew on a trip to Azerbaijan in 2008. Afterward, Jonathan emailed a relative of Aliyev's wife who ran the country's largest company, Pasha Holding. "We are business advisors to HRH and travel with him on various engagements globally where we believe we can operate as independent investors/advisors with his assistance through his unique network," he wrote.

Jonathan went on to detail the services Blackfish, his family investment office, could provide. He said it handled money for other heads of state and ultrahigh-net-worth individuals. And he asked for the contact details of Aliyev's daughters, Leyla and Arzu Aliyeva, whom he'd invited to stay aboard the yacht of British investor Joe Lewis when they visited St. Tropez later that summer. The daughters are among the beneficial owners of Pasha, according to a 2014 company filing made public by the OCCRP.

A SOURED LOAN to one Banque Havilland client led to a foreclosure on a $49 million apartment at One57 in New York

Andrew and the Rowlands made another trip to Azerbaijan later that year. The prince was there in his official capacity as trade envoy. It was dark by the time the visitors descended the steps to the tarmac at Baku Heydar Aliyev International Airport. Sporting matching gold ties and dark business suits, Andrew and David were met by Britain's ambassador to Azerbaijan and an Azeri government minister. Later that evening, Andrew met with Aliyev.

A Roster of Risky Business

ARZU AND LEYLA ALIYEVA
Azerbaijan / Daughters of President Ilham Aliyev

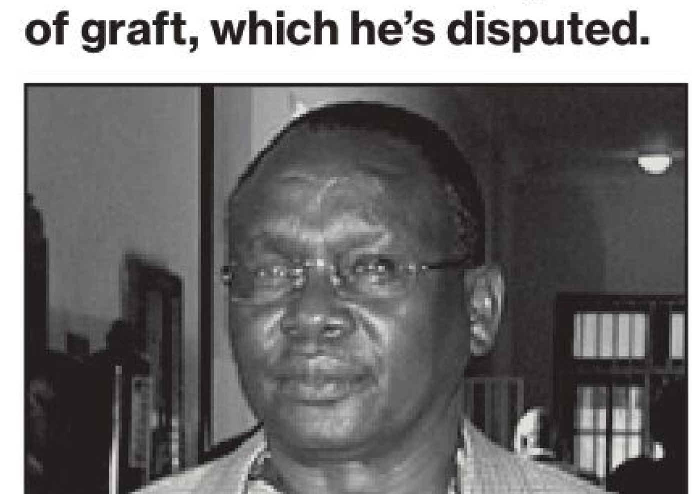
U.S. diplomats have privately described the country under Aliyev as being run in a feudal manner, and he's been accused of rigging elections. The Aliyev family and its associates hold assets of more than $3 billion, and the sisters are among the owners of the country's largest business. They opened several accounts at Banque Havilland. Luxembourg's regulators said the bank didn't have appropriate measures in place for such "high-risk clients."

ARKADY PATARKATSISHVILI
Georgia / Billionaire businessman and politician

Although Patarkatsishvili died in the U.K. in 2008, a company controlled by his heirs borrowed $5 million from the Rowlands, which was routed through one of their accounts at Banque Havilland. A compliance officer at the bank warned that the Georgian was an alleged criminal and that his money was tainted.

JOSHUA KULEI
Kenya / Former assistant to President Daniel Arap Moi

Received a £2.2 million mortgage from the bank even though he'd been banned from the U.S. after allegations of graft, which he's disputed.



KOLAWOLE ALUKO
Nigeria / Energy executive

Borrowed €25 million from the bank, pledging a 213-foot yacht and his New York penthouse as collateral. The U.S. Department of Justice would later allege that he conspired to bribe a government minister to steer contracts from Nigeria's state-owned oil company his way. Both Aluko and the minister have denied this.

ONE57: ROBERTO MACHADO NOA/GETTY IMAGES. CUSTOMERS: GETTY IMAGES (3); COURTESY YOUTUBE (1)

The president's reputation was no obstacle to the Rowlands. In 2009, the emails show, Pasha routed $5 million to an investment fund controlled by the Rowlands that had an account at Banque Havilland.

The Rowlands' ties to the Aliyevs deepened from there. In 2014, Banque Havilland bought a Bahamas-based bank where Aliyev's daughters had accounts. The sisters subsequently opened five additional accounts at Banque Havilland in Luxembourg, according to a 2018 report by the country's financial regulator, the Commission de Surveillance du Secteur Financier (CSSF). Despite classifying the sisters as politically exposed people—a flag to give a customer special scrutiny—the bank didn't obtain sufficient supporting documentation to establish the source of their wealth, the report shows.

It also shows that the sisters subsequently used one of the Luxembourg accounts to lend money to two companies whose main role seemed to be making loans to the family of Mikhail Gutseriev, another potentially politically exposed person. The largest shareholder of RussNeft PJSC, Russia's sixth-largest oil producer, Gutseriev has interests in Azerbaijan, too. In 2007 he fled to London after being charged with tax evasion and fraud by Russian authorities—accusations that were later dropped. The Aliyeva sisters cooperated with him on various deals, according to a note in their Banque Havilland file, which the report shows didn't give further details. Gutseriev says he doesn't know Aliyev's daughters and never had any business dealings with them or their father. Aliyev and his daughters didn't respond to a request for comment.

There should have been little doubt about the difficulties of banking the daughters. Documents held by Banque Havilland showed that the Aliyev family's transactions had been under surveillance by U.S.-based banks and that two banks in Dubai no longer wanted to be used as conduits for their cash, according to Luxembourg's regulator. Its report concluded that Banque Havilland hadn't put appropriate measures in place for these "high-risk clients" or obtained sufficient documentation to establish the purpose of their business relationship with Gutseriev. The Banque Havilland spokesman says he can't comment on whether specific individuals held accounts, citing confidentiality laws.

In October 2018, David and Jonathan Rowland and their wives had front-row seats at the wedding of Andrew's youngest daughter, Princess Eugenie, at St. George's chapel in Windsor Castle. Dressed in a morning suit, a silver tie, and a matching waistcoat, David sat next to supermodel Kate Moss. Demi Moore and Liv Tyler were seated nearby, as was Johnny Hon, a businessman from Hong Kong. Hon had arranged the Rowlands' 2011 visit to North Korea, where they pitched their services to a representative of leader Kim Jong Il and his family. Although Andrew didn't join the Rowlands on that trip, Hon had introduced them as friends of the prince, emails show. (Hon declined to comment.)

That day at Windsor Castle may have marked the high point in David Rowland's social rise. But a legal noose was tightening around the bank. Banque Havilland's 2015 loan to Aluko, the Nigerian energy executive, was coming under scrutiny. As collateral, Aluko had pledged a 6,240-square-foot penthouse at the One57 tower in Manhattan, bought for $49 million in cash in 2014, as well as his $80 million, 213-foot yacht, *Galactica Star*.

The bank stood to get its money back and make tens of millions of dollars more if Aluko defaulted. Within days of the loan papers being signed, a former oil minister of Nigeria was arrested for bribery and money laundering offenses. The U.S. Department of Justice would later say Aluko made payments to her to win lucrative oil contracts, allegations both of them have denied. Aluko defaulted on the loan in September 2016, putting the penthouse into the biggest foreclosure in New York history.

But the transaction backfired on the bank. After it started foreclosure proceedings on the apartment, the bank was publicly linked to the scandal. Luxembourg's regulator was soon asking questions. (Aluko, who is under investigation, declined to comment through his lawyer.)

In March 2018, Banque Havilland filed a suspicious activity report with the regulator regarding one of Aliyev's daughters, according to the report. It was too late for the bank to avoid the regulator's wrath, though. That month it sent the firm a letter announcing its intention to fine the bank for anti-money-laundering failings regarding the Aluko loan. Investigators searched the bank's offices.

In April another letter arrived. The 16-page document accused the bank of flouting Luxembourg's laws to prevent money laundering and terrorism financing. It described serious breaches of internal governance, inadequate monitoring of client relationships, and an insufficiently critical mindset among its compliance officers. And it referred scathingly to the timing of the suspicious activity report for Aliyev's daughter, saying the bank should have filed one the day it took them on as clients. "We consider that the significance/importance, frequency, duration, and persistence in time of the shortcomings identified, have compromised the sound governance and performance of your Bank," the regulator wrote.

Later that year, two months after the wedding, Banque Havilland was fined €4 million. As part of the settlement, the bank agreed to put further international expansion on hold for an unspecified amount of time. According to its spokesman, it also redefined its approach to risk after the March inspection and ended relationships with some clients. "The bank was fined in relation to historic issues arising from CSSF audit findings" and not in relation to specific clients, the spokesman says. "These findings have been remediated and the bank operates unrestricted."

The breaches identified by the regulator were nonetheless considered so egregious that it referred the case to prosecutors in Luxembourg, who opened an investigation. Insiders describe a bank under siege, with the regulator scrutinizing its activities and executives being interviewed by prosecutors.

That could raise more questions for Prince Andrew, who already has plenty on his gilt-edged plate. Ⓑ —*With Stephanie Bodoni, Irina Reznik, and Gaspard Sebag*

LYSOL IS WORKING ON IT

THE SANITIZER MAKER IS CHURNING OUT MORE PRODUCT THAN EVER BEFORE. BUT WITH A PANDEMIC WINTER ON THE WAY, THAT'S STILL NOT ENOUGH

BY DREW ARMSTRONG
PHOTOGRAPHS BY CHRIS MAGGIO

One of America's most recognizable icons of fresh-scented cleanliness comes from New Jersey. No matter where U.S. shoppers are lucky enough to spot cans of Lysol, the sanitizing spray was almost certainly produced at the same sprawling, tan-colored factory, in a suburb an hour's drive from New York City. Over the noisy plant's concrete floors, a steady stream of empty cans clink through an assembly line, waiting to be filled. On the line, a machine packs them all with a blend of ethanol, another disinfecting chemical called a quaternarylan ammonium compound, or quat, and some scent. Employees call the mixture the Juice.

A machine called a Filtec scans each can to make sure it got exactly 19 ounces, then a device called a crimper adds the metal top that will spray the Lysol through the attached plastic straw. In a separate room, another machine uses the straw to inject the butane that propels the spray; then the can gets a bath in a pool of 140F water surrounded by a half-inch of ballistic glass. This makes it almost impossible for the top to burst later, unless somebody throws one into a bonfire. "If it's going to explode, it will blow here," says Shahzeb Malik, the site director. "Not on the shelf of a Walmart." Other machines push on the plastic nozzle, wrap on the Lysol label, and add a cap up top. The cans are bundled into cases and pallets, which are placed onto distribution trucks by forklift, while new, empty cans arrive from a supplier in Pennsylvania.

The pace has been quicker throughout the pandemic, because the plant has been running around the clock, excepting the downtime for shift changes. Every day the factory uses up at least three tanker cars of ethanol that arrive by train, each carrying about 30,000 gallons. The plant can produce 700 to 800 cans of Lysol a minute, all of them quickly bought and used, or hoarded, by Americans desperate to keep their stuff virus-free.

For the record, Lysol works. SARS-CoV-2 is an enveloped virus, a clump of genetic material wrapped in a membrane of fatty lipid molecules. Lysol's ethanol and quat act as solvents, ripping apart the lipid skin and leaving the viral material inert. That doesn't mean anyone should inject it, a treatment President Trump suggested doctors consider with disinfectants, including bleach, earlier this year. "Under no circumstance should our disinfectant products be administered into the human body," the updated Lysol website currently reads, because that's where people are at these days.

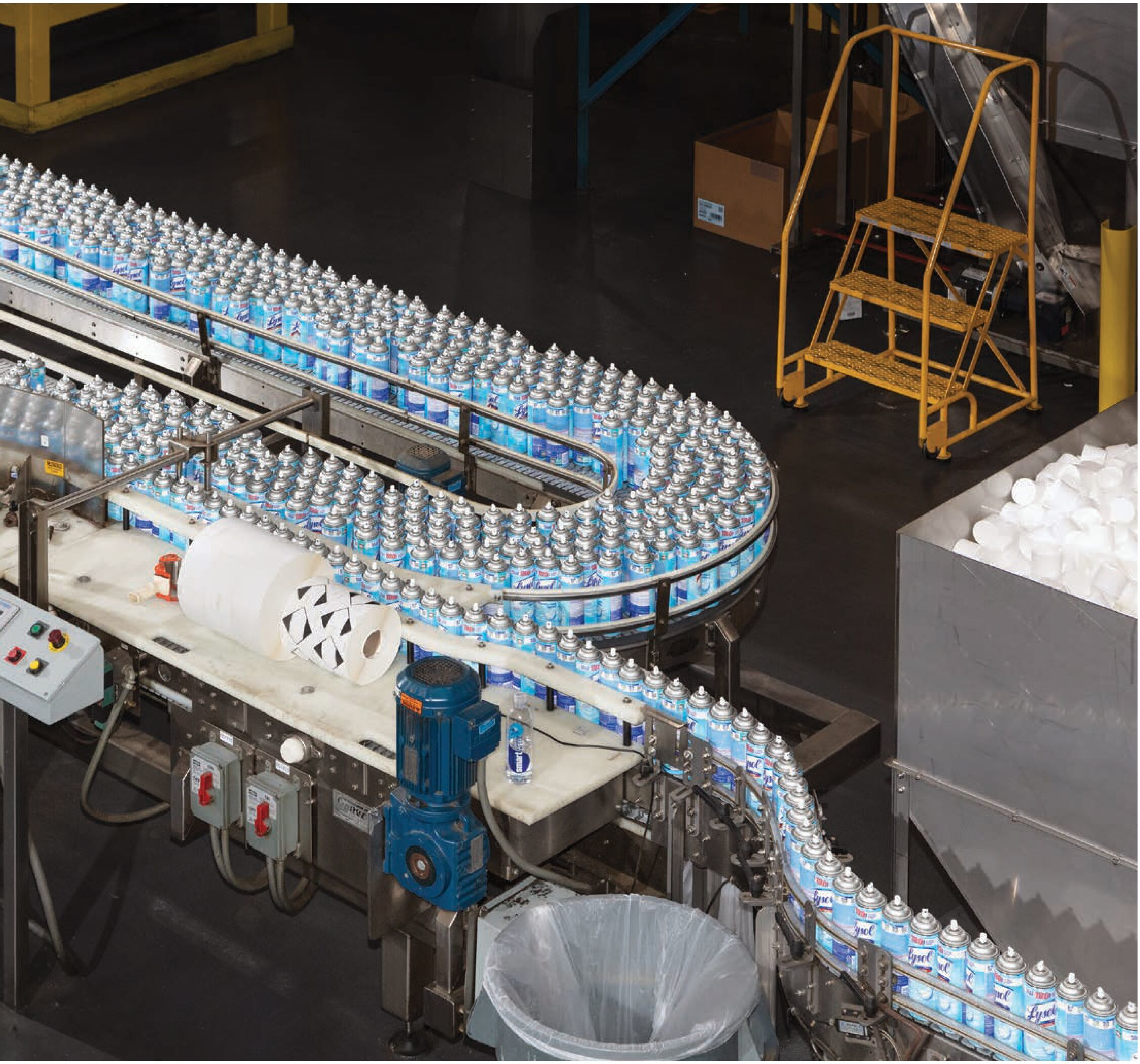
Over the course of this maddening year, Lysol has been one of the few products that's steadily experienced an unprecedented demand. It's approached frenzy, a level of panic-buying on par with purchases of toilet paper and rice. In early March, when the New Jersey sales team tested the fervor by sending one retail store in Florida 10,000 cans, they sold out in less than two hours. Reckitt Benckiser Group Plc, Lysol's corporate parent, says that by yearend it'll be producing 35 million cans of Lysol in North America each month—more than triple its pre-Covid-19 peak and enough to put a can in most American households before winter is over. So far, Lysol sales are up more than 70% this year, pushing Reckitt's market value to well over $60 billion. The company has gained market share while rivals like Clorox Co. have stayed flat or struggled to keep up. And yet the increased production hasn't been enough to keep store shelves consistently stocked.

Reckitt Benckiser saw this coming, both from its corporate headquarters outside London and at one of its biggest manufacturing hubs, located about 140 miles west of Wuhan, China. But there was only so much the company could do to accommodate everyone. Lysol's parent has proven a leading indicator at several key points in the pandemic. With winter

● THE LYSOL PLANT IN NEW JERSEY CAN MAKE 700 TO 800 CANS A MINUTE approaching, the latest is this: For all its successes in adapting its lean global supply chain to a hundred-year plague, the company still hasn't quite managed to match supply to demand. "We've been very transparent about what we have and what we don't have," says Reckitt Chief Executive Officer Laxman Narasimhan. "In some cases, we do disappoint."

Covid terror would have sounded familiar to survivors of the cholera epidemics that swept much of the globe in the mid-1800s. Outbreaks killed hundreds of thousands of people who lacked access to clean water in the U.S. and Europe. One killed 3,000 New York residents in a matter of weeks and chased tens of thousands of people out of the city. By the end of the 19th century, germ theory had for the first time pointed to microscopic pathogens as the cause of infectious disease, and businesses were promising new forms of chemical protection. In 1889 a German chemist named Gustav Raupenstrauch created Lysol. During the snake-oil era, the early owners marketed Lysol as everything from a household cleanser to, more troublingly, a feminine-hygiene product.

Today's owners have restricted Lysol's use to surfaces, not people. Besides the cans, the company sells disinfecting wipes, which rely on milder quats; cleaning sprays for ▶



● CASES OF LYSOL SPRAY ARE PUT ON PALLETS FOR SHIPPING

◀ kitchens; and a toilet bowl cleaner. The modern brand owes much of its luster to Joe Rubino, who started working on Lysol research and development in the 1980s, a couple of owners ago. Rubino, known inside the company as Mr. Lysol, is the R&D unit's go-to communicator. He's spent most of the past few decades running experiments to show just how gross everyday life can be and what a good chemical spritz that kills 99.9% of germs can do about it. "We're designed to share germs," he says in a Garden State accent. "Even if we're healthy, we're spreading our organisms to everybody."

In a 1990s study, Rubino's team coated a toy ball at a daycare center with a harmless virus that could serve as a sort of contact tracer. When the researchers used swabs to test for the virus at the end of the day, all nine kids at the daycare had bits of it on their hands, and they spread it everywhere at home, too, from high chairs to bathtubs to beds. In 2007 the company put 30 people with the common cold in separate hotel rooms for a night, then found traces of the cold virus throughout the rooms.

Some of the more photogenic Lysol science has taken place at the brand's R&D center in Montvale, N.J., located below the New York state line. The R&D team keeps a list of about 1,000 customers it can invite into its mock kitchen or suite of glass-enclosed bathrooms to provide opinions on product scents and spray-bottle sounds. The pièce de résistance is room A-154, better known as Flushing Meadows. It's an ode to the commode, a throne room lined with 104 toilets from around the world, arranged inches apart in three aisles beneath national flags. Tanks and filters in an adjacent room replicate the water conditions in different countries, and above each bowl, mechanized plungers test the toilets at different flush rates. "Laying the foundation for success," a plaque on one wall reads.

During a *Bloomberg Businessweek* visit to the R&D center this fall, the Flushing Meadows toilets were helping to test experimental products code-named for *Donkey Kong*, *Tetris*, and other video games. To conduct smell tests, the staff can fit a plexiglass hood over a bowl, then open a top flap on the hood in turn and breathe deeply. "A lot goes into making toilet bowl cleaners that you would never even think about," Rubino said in an understatement. "We can make rust stains in here. We can make simulated fecal stains, and we'll see how well the products remove that." (The faux poop comprises dirt, brown dye, and sometimes peanut butter, he said. "There is a formula for it.")

This visit was Rubino's first time back at the R&D center in months. Although he semiretired in 2019, he's continued working from home three days a week through the pandemic. His version of the Covid nightmare began in late December, with an email from a medical alert service called ProMed. The subject line was "Undiagnosed pneumonia–China." A week and several escalating alerts later, Rubino sent a note to colleagues: "Here's something we need to watch." ▶

● RUBINO HAS WORKED ON LYSOL R&D FOR MORE THAN 30 YEARS

IN THE ROOM KNOWN AS FLUSHING MEADOWS, TOILETS REPLICATE WATER CONDITIONS FROM AROUND THE WORLD

◀ Up the Yangtze River from Wuhan lies the city of Jingzhou, home to one of Reckitt's biggest manufacturing plants. (Most of the products made there are part of Lysol's sister brand, Dettol.) In late January, when lockdowns began in Hubei province—which includes both cities—David Gao, site director of the Jingzhou plant, called his lieutenants and told them not to go home. The timing could hardly have been worse; it was the start of the weeklong Chinese New Year, when the whole country goes on vacation. About 350 of the factory's 400 workers had already left the city, and not enough remained to restart disinfectant production. With the public-health crisis spiraling, Gao canceled his employees' vacations and negotiated travel permits with the government to allow them to return to work. "I talked to the government and told them we are the factory to make the disinfectant," Gao says.

The permits came through WeChat, and managers helped return close to 300 people. One worker rode a bicycle six hours to get to the plant, Gao says; another walked 13 hours. The government helped put the Reckitt staff up in hotels for weeks, isolated even from their families, and a neighboring factory boss topped up the plant's dwindling supply of masks in exchange for disinfectant. Gao says no one at the plant got Covid. "The employees sacrificed a lot," he says. "Nobody quit."

By the end of January people in Europe were testing positive for the disease, the World Health Organization had declared the coronavirus an international public-health emergency, and Narasimhan, who'd been Reckitt's CEO only a few months, ordered his executives to maximize production by any means necessary. "Guys, turn on the factories 24 hours," he recalls telling them during a conference call. "We went full blast."

One problem with going full blast was that every consumer hygiene company in the world was doing the same thing, and they all rely on a lot of the same key ingredients. With Lysol and its rivals gobbling up hundreds of thousands of gallons of ethanol and tons of quats, there wasn't enough to go around, even when the pandemic-jumbled supply chain was at its best. And like many global manufacturers, Reckitt keeps little spare material on hand; it relies on shipping companies to deliver steady supplies. "It's a global supply chain, and it's not integrated," says Frederick Dutrenit, senior vice president of supply for the company's health division.

The Jingzhou factory, for example, needed outside suppliers to deliver more than 100 different raw materials and parts. When he learned there wasn't enough of a critical chemical left in all of China to meet its increased production

● PRODUCTS BEING TESTED IN THE MONTVALE R&D LAB needs, Dutrenit decided to eat the cost of flying in more from the U.K. For a supply chain executive, having to air-freight tens of tons of raw materials across continents is something close to a worst nightmare. His bosses didn't want to raise prices and be seen as taking advantage of the pandemic. "We decided not to do any compromise on this," Dutrenit says. "Margin has not been a driver."

As Covid spread through the U.S. and Lysol hoarding began in earnest, the assembly lines started running short of quats and ethanol. Again the supply team found answers in Europe, flying in more quats. Eventually the company located a plant in Nebraska with spare ethanol from its lower-grade gasoline additive and retooled it to make purer ethanol for Lysol. It also looked online to see who around the world was selling alternatives to Lysol or Clorox products—the hundreds of small, never-heard-of-it brands that suddenly populated Amazon.com and other websites this spring—and began signing deals with the smaller companies to use their production capacity.

Pre-Covid, Lysol production capabilities in North America topped out at about 10 million cans a month, according to Reckitt. With more than a dozen contractors signed up to produce more, the monthly number should hit the 35 million mark by the end of the year, the company says, plus more than 30 million cans of wipes, up from less than 7 million cans a year ago.

While the company still hasn't been able to meet all of the demand, its gains in market share suggest that it's outpacing competitors. Along with the 70% revenue increase for Lysol products, Dettol sales are up 50% around the world, and Reckitt has managed to keep other cleaning supplies in circulation, too. Because people are staying home more, they're using more of the company's dish detergent. They're lonelier, so they're getting pets and buying more Resolve, its spray product for carpet messes. More cooking and pets mean more smells in the house, therefore people need more air fresheners. Sales of the company's Durex condoms, however, have yet to rebound to pre-pandemic levels.

Reckitt expects something like the current level of demand to last through much of 2021. It says increased capacity from new contract manufacturers will allow it to sell as much Lysol as retailers want by the spring and to resume making products in the scents and sizes it eliminated this year for the sake of efficiency. "People will want to get their favorite fragrance back," says Harold van den Broek, the president of Reckitt's hygiene business. "They will want to get the wipes that they were used to." Narasimhan says he's considering introducing a hand sanitizer in the U.S. market, where Purell dominates.

Reckitt is also investing in more U.S. manufacturing facilities, so it can reduce its reliance on contractors later this year and, it says, be self-sufficient by 2023. The added capacity is a bet that the pandemic has permanently changed how people think about cleaning their houses and themselves. "Even when this all goes away, demand for our products will be structurally higher than what they were pre-Covid," Narasimhan says.

● RECKITT PLANS TO BRING BACK SOME LESS-COMMON SCENTS IN 2021

While that bet seems pretty safe right now, it remains tough for the company to gauge exactly where demand might settle. About three months ago, the Lysol team began sending 10 times its usual shipments to a group of 30 to 50 U.S. retail stores, depending on the day or week. Some days, the company says, every last item sells within two hours. (It's not a perfect test; the Lysol team has received reports that customers post online whenever they spot cans or wipes in the test locations, bringing in more shoppers.) For now, and likely through the winter, many Americans in search of Lysol and other household disinfectants won't be able to buy as much as they want.

During a typical shift at the New Jersey factory, from 7:30 a.m. to 3:30 p.m., a digital counter on a wall keeps track of how many finished cases the assembly line has produced. On that day this fall, with about an hour left in the shift, the count stood at 6,475 cases of Lysol, or almost 80,000 cans. In the packing area, the machines were still loud enough to require earplugs. Cal Swedberg, Reckitt's regional manufacturing director, looked up as hundreds of finished canisters wound down rows of conveyor belts stacked 20 to 30 feet high. Employees call it the Wall of Lysol. As the cylinders rolled off the line to be wrapped into cases, and then into 2,000-can pallets, Swedberg said: "That lasts at Costco about 3 minutes." B

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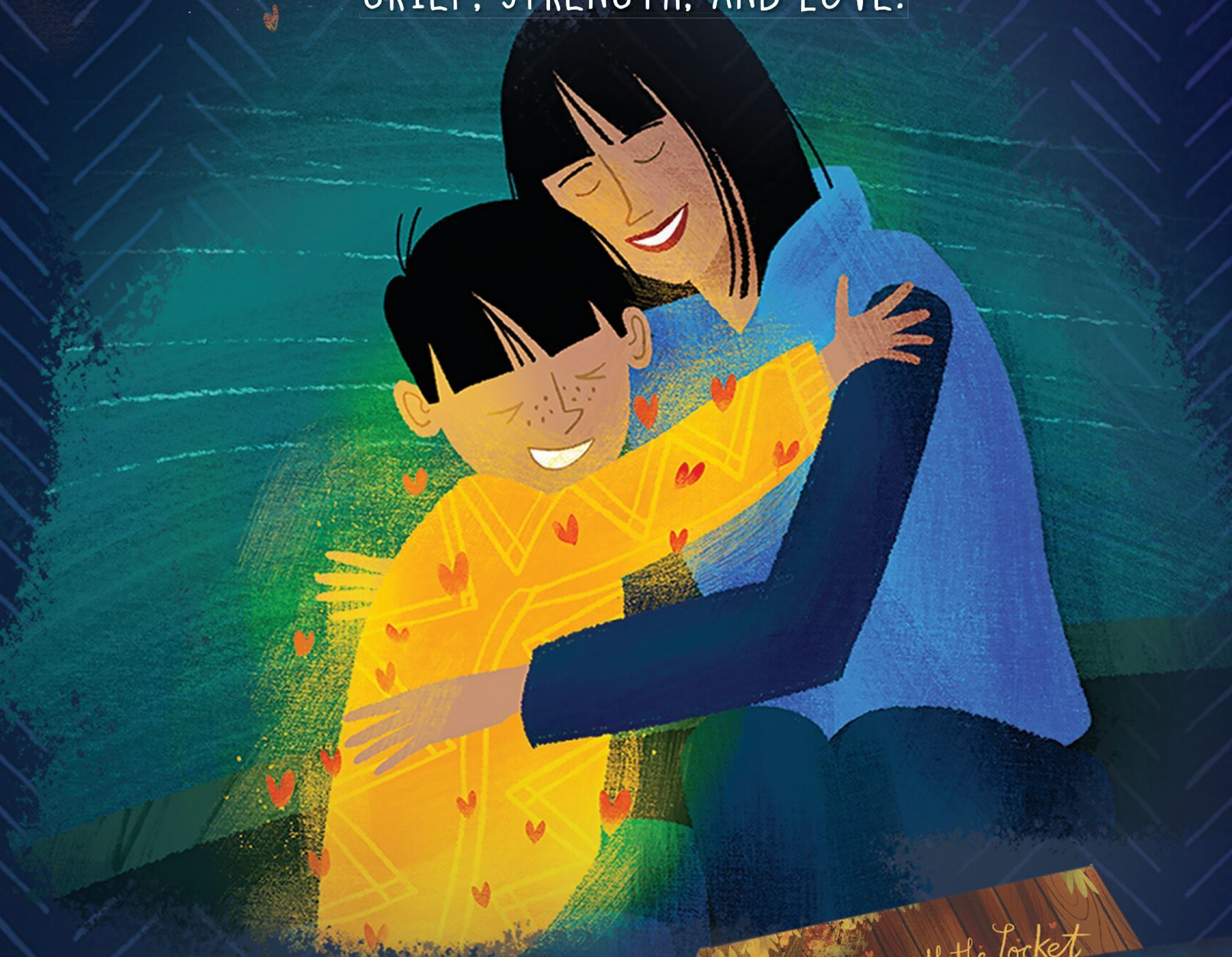

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2020 HOLIDAY GIFT GUIDE

crank up the cozy

There's one thing on everyone's wish list this year: a return to normalcy. Until then, these 43 gift ideas will help you maximize your loved ones' comfort zones

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PREVIOUS PAGE:

WATCH ME CLOCK
Gaetano Pesce's surreal design is emblematic of 2020 time. Handmade from resin in red and orange, it's overlaid with fanciful numbers. *$300; comingsoon newyork.com*

BELGRANO TEA STRAINER
A comfy brew will look better than ever with an angular brass utensil that can either strain loose leaves or steep directly in a cup. *$36; shopsirmadam.com*

CRIMSON CHAI
This relaxing, caffeine-free blend uses South African rooibos and cardamom with cinnamon and other spices. It's naturally sweet—milk and sugar are optional. *$53.50 per lb; inpursuitoftea.com*

1948 TEACUP AND SAUCER
Help them avoid early morning spills with a generously sized vessel, even though brilliant splatters—in real gold, no less—make it look otherwise. *$46; jonathanadler.com*

ROYAL OAK OFFSHORE WATCH
A sportier version of the classic is also available in a blue or green dial. *$45,900; audemarspiguet.com*

The pillow and blanket are available in seven other plant-based colors, including cocoa and champagne

their secret reading nook

REX FUR PILLOW AND THROW
Give them a touch of the louche attitude that interiors studio Roman and Williams brought to the Boom Boom Room. This fur pillow and blanket set is shed-proof and seen here in a shade of buff. *$250 (pillow), $2,400 (blanket); rwguild.com*

MARIAN GLASSES
Offset screen fatigue with blue light-filtering lenses. Garrett Leight can fit any optical frame, including the brand's classic Marian style. *$410; garrettleight.com*

EYEWEAR STAND
One place to keep glasses safe from scratches is this brass pedestal that fits a wide range of frames. When in use it looks like a nose, giving home desks a playful persona. *$48; craighill.co*

MEISTERSTUCK *LE PETIT PRINCE* LEGRAND PEN
Named for Antoine de Saint-Exupéry's beloved children's story, this pen has a burgundy wood cap with a star motif that references the book and a gold-coated nib that bears the titular prince's rose drawing. *$2,165; montblanc.com*

BOOKSCAPE BOOKMARK
Not only will it hold their page, the 14-inch-tall sculpture also makes a handsome freestanding piece of decor. *$380; treyjonesstudio.com*

THE GUCCI MANE GUIDE TO GREATNESS
The Atlanta hip-hop star follows his 2017 autobiography with a self-help book about his rules for success, including: "Nobody cares, work harder," "Avoid lazy and miserable people," and "If you keep looking back, you'll trip going forward." *$28; bookshop.org*

STARLING SLIPPERS
These hunter green women's flats marry a plush velvet with a seven-layer quilted satin insole to provide arch and heel support. An exterior rubber layer gives additional protection if they venture outdoors. *$95; birdies.com*

ABD EL KADER CANDLE
Adorned with the gold seal of Trudon, a king in wax since 1643, the candle is scented with Moroccan mint tea and ginger. It can burn for 60 hours. *$105 for 9.5 oz; trudon.com*

for a rare night out...

A total of 208 diamonds surround this 10.37-carat sapphire

CLUSTER NECKLACE AND RING
The cluster motif has been an icon since the 1940s. This necklace (top) and ring (below right) highlight blue sapphire and pale blue aquamarine and are accented with diamonds. *Price on request; harrywinston.com*

HIGH JEWELRY EARRINGS AND RING
If red is their color, these fan-shaped earrings hold 9 carats of rubies. The ring (below left) is set with a 3.8-carat pink sapphire. *Price on request; bulgari.com*

MAGNITUDE BRACELET AND EARRINGS
Pairing precious diamonds with rock crystal is a unique combination in this strata of bling. Cartier's peridot suite features a bracelet (center) and earrings (bottom) in enviously green hues. *Price on request; (800) CARTIER*

HIGH JEWELRY RING AND WATCH
Give gems that will match wrists with fingers. The Secret watch (left) hides the dial under a hinged 21.64-carat sapphire; the ring above it surrounds a 10.37-carat sapphire with curved waves of diamonds. *$885,000 (watch), $515,000 (ring). All prices subject to change; (800) CARTIER*

... or a spa day at home

PINK MARBLE EYE MASK
The sleep aid that started the mask-as-beauty-accessory craze uses the highest grade mulberry silk blend and comes in a range of lively colors and prints. *$50; slip.com*

ORNELLAIA 2017
This latest vintage of one of Italy's legendary wines has been wowing critics. Big and rich and hailing from the Bolgheri region in Tuscany, it has ripe red fruit aromas with notes of sweet tobacco and vanilla. *$260; vintus.com*

POLPO WINE GLASS
Italian artist Simone Crestani creates intricate glasses that often use animals in the design. This one features an octopus climbing the stem with its tentacles, as if reaching for a sip. *€185 ($219); simonecrestani.com*

NANO GOLD REPAIR LIP MASK
This collagen-based application locks in moisture and heals fine lines around the mouth with tiny particles of colloidal gold. Think of it as a down payment on a kiss for weather-beaten lips. *$18; knesko.com*

OVER THE MOON GUA SHA SET
Give the gift of self-care that's based on a 4,000-year-old Chinese practice. The set includes a "Lunar Drops" formula, made from a base of sunflower and moringa, and a rose quartz tool that has a cooling effect. Together they'll help release facial tension in case 2021 turns out to be more of the same. *$75; pinkmoon.co*

CASHMERE THROW
At 50 by 70 inches, this luxurious blanket is large enough for someone to curl up in, yet also compact enough to fold on the end of a king-size bed. It's made from 555-gram-weight Mongolian cashmere, which is as cozy as it is durable. *$399; rh.com*

SLOW BURN CANDLE
A collaboration between on-trend Boy Smells brand and country star Kacey Musgraves, this scent elicits a warm amber and incense aroma accented with raspberry. *$39; boysmells.com*

WOOL TURTLENECK
Dior's new ski collection for men is an elegant way to channel the slopes. This white pullover features "CD" embroidery—for Christian Dior—in a purple and gray Fair Isle-inspired motif. *$2,200; (877) 903-4671*

CHESTERFIELD CARDIGAN
Or give a knit made from double baby cashmere, which comes solely from the underfleece of Hircus goats less than a year old. So, yes, it's the softest thing ever. Unlike Granddad's sweaters, the clean silhouette bestows warmth without the bulk. *$2,050; us.loropiana.com*

RAFA JUMPER
For those who like to look put together (without looking like they're trying too hard), this jumpsuit for either men or women zips up the front for easy stepping in and out. Made in Los Angeles from cotton twill and corduroy, it has deep front pockets and is also available in saffron and moss colors. *$325; selvanegra.us*

CAROL BOOTS
Hiking meets high fashion in these stylish shoes, which sport graphic colors, a padded collar, and a lace-up closure with a strap over the top. It all stands on a thick rubber lug outsole. *$715; moncler.com*

to brave the elements

A 5cm block heel on the boot rises above almost any level of snow or slush

a grand entrance...

The difference between toasty hands and overheated ones lies in the tiny perforations in the suede

ORIGAMI FLOWERS
Order a bouquet that won't fade by January with a few stems made from leather. Designed by Atelier Oï as part of Louis Vuitton's Petits Nomades collection, this poetic take on paper folding stands 20 inches tall and bears metal rivets to hold it all together. *$375 per flower; us.louisvuitton.com*

SWIRL VASE
The psychedelic patterns catch eyes even when this vase is holding an arrangement. Created from a new material made of powdered marble, the 11-inch vessel stands on a heavy base that can support even the largest floral creations. *£550 ($725); tomdixon.net*

SHEARLING-LINED GLOVES
Once unwrapped, these perforated suede gloves should remain near the front door. Made by Brunello Cucinelli, the master of laid-back luxury, they're lined with ultrasoft shearling and have elastic cuffs and snap fasteners to stay snug. *$1,195; mrporter.com*

ANA SUNGLASSES
The Brazilian brand Lapima is known for vibrant colors and bold styles. This retro cat-eye shape in a tropical red hue will grab attention, even if their only outdoor time is running to get the mail. *$485; us.lapima.com*

...or an elegant adieu

TIGER-PRINT SCARF
At almost 4 feet long and made of wool and mohair jacquard, this Saint Laurent stole is an indulgently soft option for those who want to stay warm with a bit of Parisian cool. *$445; ysl.com*

SADDLE BAG
Rothy's new handbag uses 100% recycled materials, including marine-bound plastic, and is just big enough for a wallet, keys, sunglasses, and hand sanitizer. A slim interior pocket can fit a new phone, too. *$175; rothys.com*

REPLICA BY THE FIREPLACE FRAGRANCE
If the scent of holiday cheer were bottled, it would be the aptly named By the Fireplace. It channels a crackling hearth with notes of chestnut and balsam mixed with vanilla and red berries. *$130 for 3.4 oz; maisonmargiela-fragrances.us*

SATIN LIPSTICK
Leave it to Hermès to create the perfect makeup accessory. The limited-edition Rose Ombré has long-lasting color and comes in a refillable color-blocked case. *$72; hermes.com*

an occasion for celebration

CHOCOLATE-CHERRY CAKE
Inventive bakery Ovenly has a dedicated following for its salty-meets-sweet confections. This two-layered cake is vegan, though they wouldn't know it from the brown sugar-caramel filling and decadent buttercream. *$85; ovenly.goldbelly.com*

WABI SABI STAND
Ceramicist Julie Hadley creates tableware for some of the world's most discerning restaurants. Her perfectly imperfect cake stands, roughly 4 inches tall and 8 inches across, are made by hand, so none are exactly alike. *$90; food52.com*

CALLA LILY CAKE SERVER
Give their dessert table a romantic air with a cake server inspired by a flower that's ubiquitous at weddings. (Remember those?) A delicate brass handle that looks like intertwining twigs completes the effect. *$65; michaelaram.com*

GALERIE DES ROIS TUMBLERS
They'll sip spirits like a royal highness with one of these crystal tumblers, whose name translates as "Kings' Hall." The design is taken from the Palace of Versailles, where Saint-Louis started providing glassware in 1767. *$130 each; saint-louis.com*

A TALE OF CAKE SCOTCH
The latest from Highlands whisky staple Glenmorangie is initially matured in bourbon casks then finished in Tokaji dessert wine barrels, which layers sweet, honeyed notes over the brand's smooth, fruity character. It's an ideal treat after (or during) the last course. *$99; glenmorangie.com*

LA GRANDE DAME 2012 CHAMPAGNE
Japanese artist Yayoi Kusama, the princess of polka dots, mimics the look of bubbles in the package's gorgeous, collectible design. Inside is the first new vintage of Veuve Clicquot's tête de cuvée—the best of the best—since 2008. *$195; veuveclicquot.com*

GANACHE BLUE BOX
Made from complexly flavored Criollo cacao beans, each piece of this rich chocolate ganache is topped with whimsical designs. Its holiday vibe extends to a gift-ready package wrapped in brown ribbon. *$72 for 25 pieces; mariebelle.com*

Boom Times for Streaming, Not for Hollywood Jobs

By Justin Fox

That the Covid-19 pandemic has been a disaster for those who work in live entertainment is no surprise. But it's also been devastating for those employed in movie and video production. People have been consuming the industry's goods at record rates—mostly via streaming services—yet employment fell almost as sharply from February to May as it did in the arts, live entertainment, and recreation sector (49% vs. 52%). Through September only a third of the lost jobs had come back.

In September, Hollywood studios and industry unions announced their return-to-work agreement—with safety protocols, you'll be happy to learn, designed in part by *Contagion* director Steven Soderbergh—so one would expect more hiring in the future. Still, there wasn't much sign of that in October's jobs numbers, which didn't break out motion picture and video production but did show a slight employment decline for the broader industry that includes theaters. Los Angeles-area permit data shows filming activity stabilizing at about half its normal levels as of late October.

That those coronavirus safety protocols increase filming costs by 10% to 20% is one reason for the slow revival, one producer estimates. Another is that some production has shifted from the U.S. to Canada and other places where Covid is less rampant. Finally, there's cause to worry that revenue added by the streaming services to the existing flows from theaters, cable, and broadcast television won't continue as streaming matures, cable and broadcast decline, and many theaters don't survive their pandemic shutdowns. Ⓑ *—Fox is a columnist for Bloomberg Opinion*

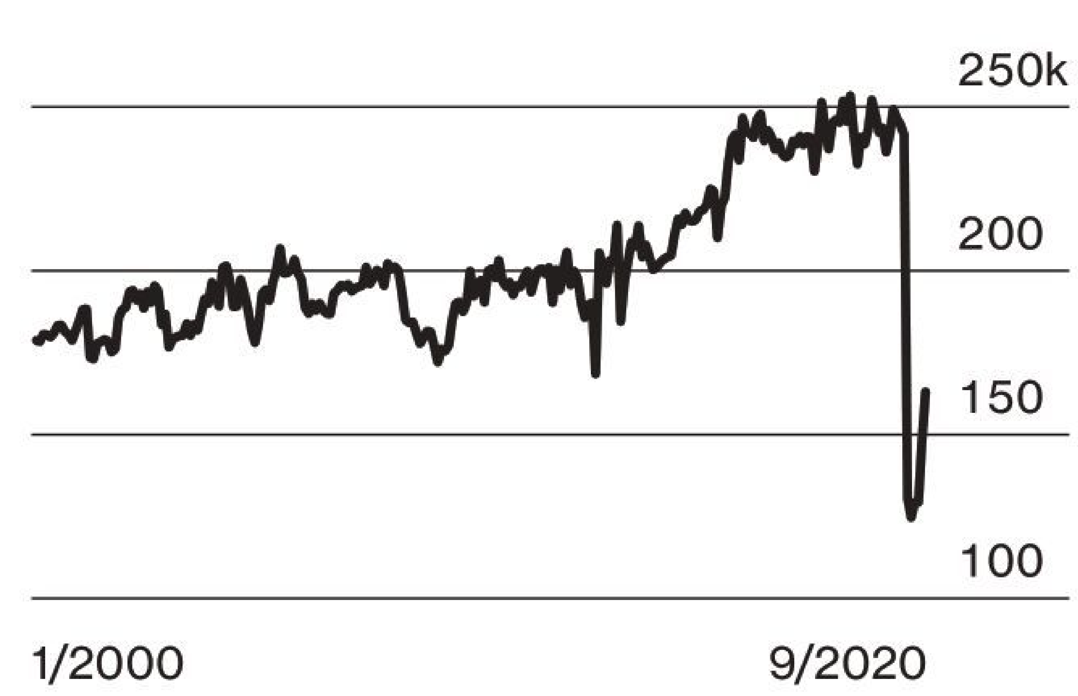
● SHORT CUTS
There were 1,967 productions with permits to shoot in and around Los Angeles at the end of October, about 47% of the normal level, according to FilmLA, the county's film office. Only 4% were feature films.

● 9 TO 5
The average weekly wage in motion picture and video production was

$1.9K

in the first quarter. The private-sector average was just under $1,000.

● Employment in motion picture and video production, seasonally adjusted



● LA-LA LAND
Before the pandemic, 52% of U.S. jobs in motion picture and video production were in the Los Angeles metropolitan area, 16% in New York, and 5% in Atlanta.

● TOP GUN
The highest-paid occupation in the motion picture industry in 2019 was lawyer, at $216,800 a year. The average annual wage for actors, producers, and directors was $91,350.

ILLUSTRATION BY GEORGE WYLESOL. DATA: U.S. BUREAU OF LABOR STATISTICS

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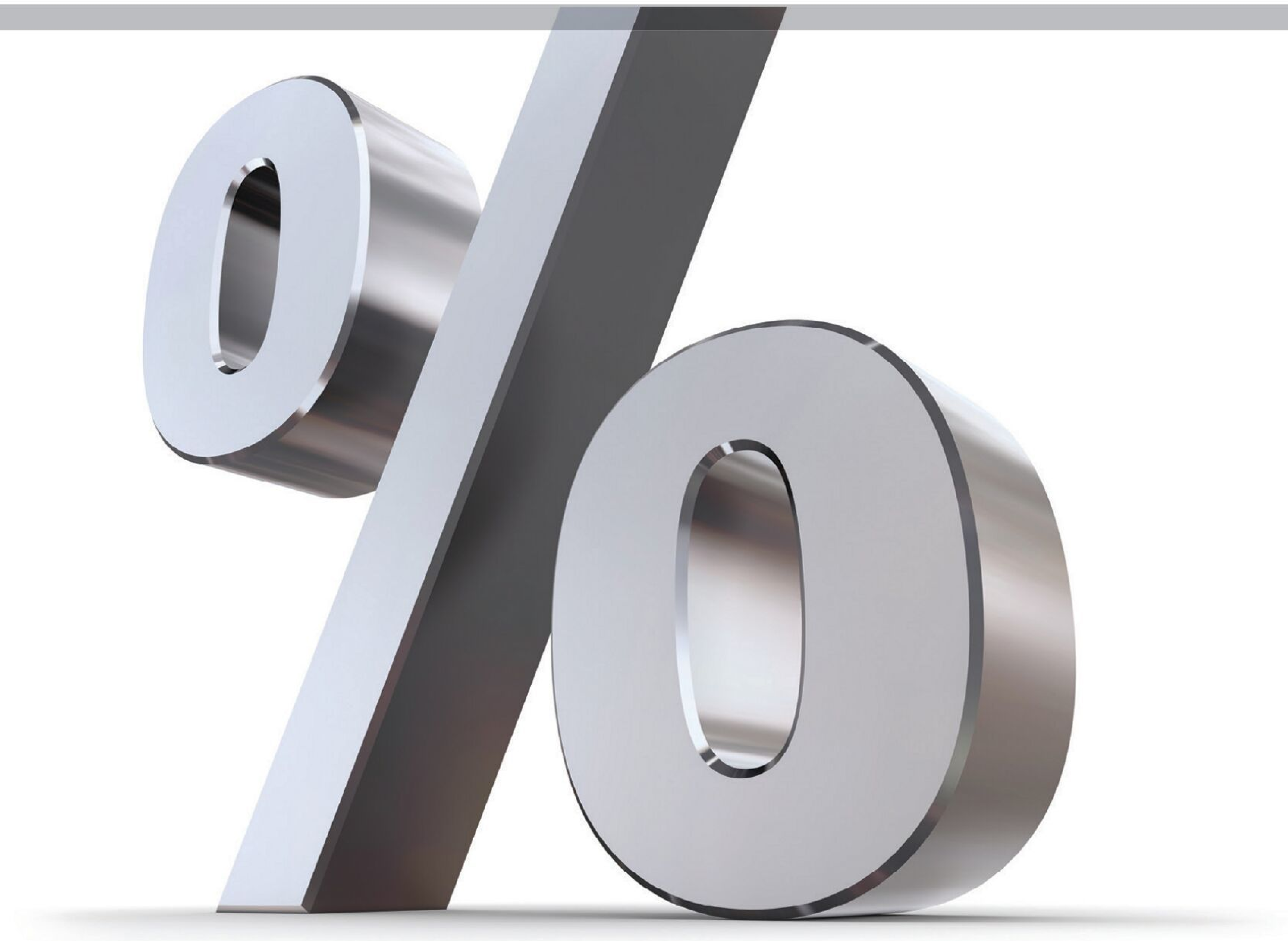


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