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Bloomberg Businessweek

January 28, 2019

BEST SHUTDOWN EVER

8


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Bloomberg Businessweek

January 28, 2019

◀ "It's halfway between *Law & Order* and *Judge Judy*, except nobody's wearing robes"

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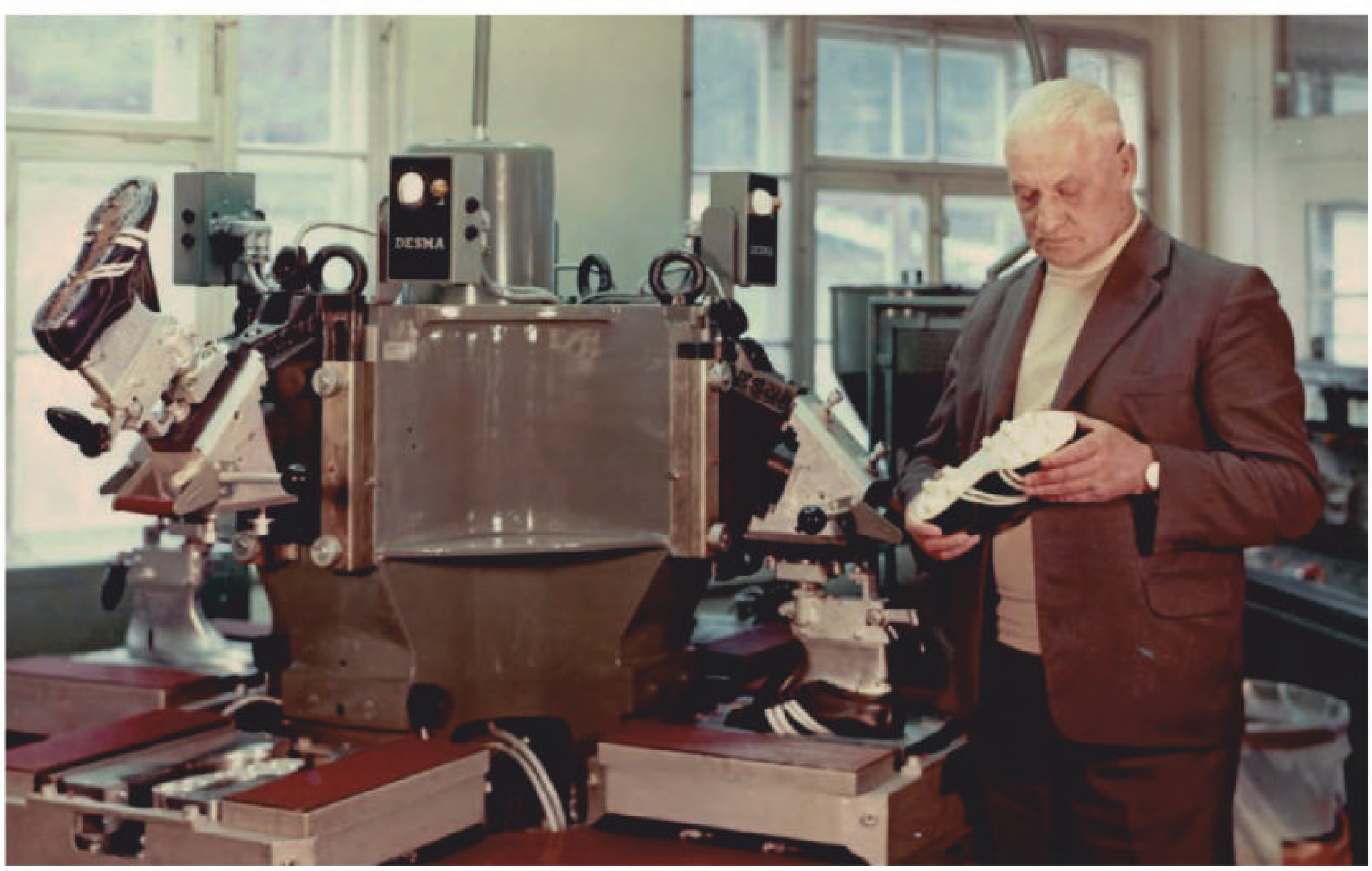

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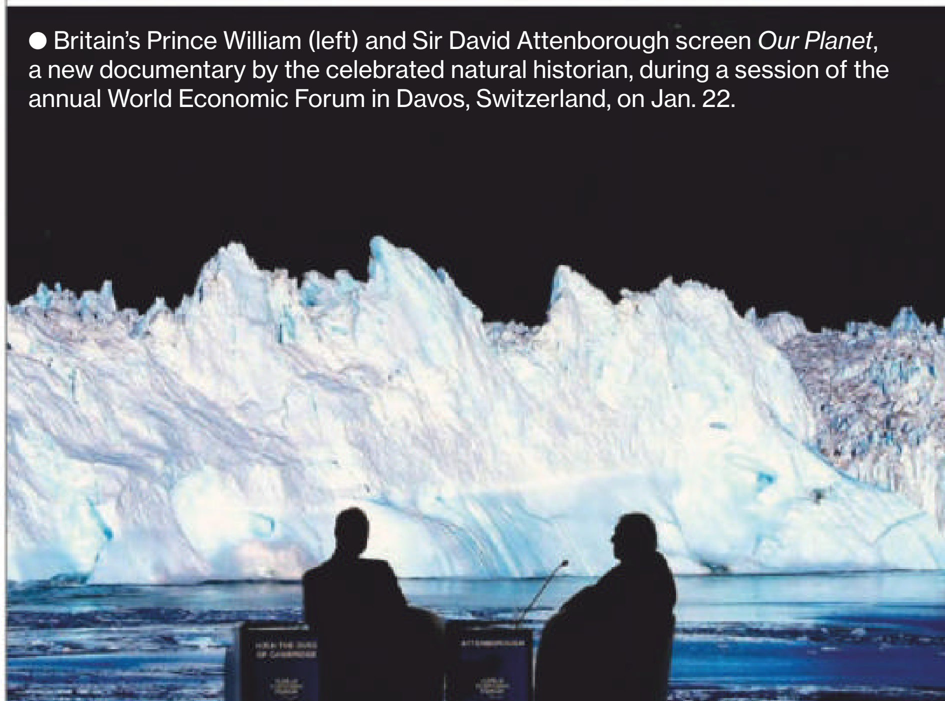
By Benedikt Kammel



● Britain's Prince William (left) and Sir David Attenborough screen *Our Planet*, a new documentary by the celebrated natural historian, during a session of the annual World Economic Forum in Davos, Switzerland, on Jan. 22.

● The International Monetary Fund cut its forecast for the world economy, the second downgrade in three months, citing weaker demand in Europe. Adding to the gloomy picture was China, which last quarter reported its slowest expansion since 2009.

● Senator Kamala Harris of California said she'll pursue the Democrats' 2020 presidential nomination.

If elected, the daughter of Jamaican and Indian immigrants would be the first woman and the first Indian American in the Oval Office.

● President Trump is backing Juan Guaidó as Venezuela's interim leader. Vice President Mike Pence had already urged locals to rally around the opposition, which has called for protests against President Nicolás Maduro. The autocratic ruler, who won a six-year term last year in an election widely viewed as fraudulent, is cracking down on open demonstrations.

● IBM rebounded from disappointing earnings with a strong fourth quarter and forecast for this year, thanks to demand for cloud computing and artificial intelligence.

IBM share price

● Activist hedge fund Elliott Management took a

$1.4b

position in EBay and pressed the online e-commerce platform to focus on its core Marketplace business, arguing the company could be worth twice as much as it is today.

● Ex-Ukrainian Prime Minister Yulia Tymoshenko kicked off her third stab at winning the presidency when the country holds elections in March. Tymoshenko lost two previous presidential elections, to Viktor Yanukovych in 2010 and to incumbent Petro Poroshenko in 2014.

● "The president has terrorized someone who wanted to tell the truth before Congress."

Lanny Davis, lawyer for Michael Cohen, President Trump's former lawyer and fixer, who's postponed his scheduled Feb. 7 testimony to Congress, citing concerns for his family's safety after calls by Trump to investigate Cohen's father-in-law.

● Brexit backer James Dyson is packing up the headquarters of his company, known for its high-power, high-price vacuum cleaners, and relocating to Singapore, in pursuit, he says, of Asia's future growth prospects.

● Citadel hedge fund founder Kenneth Griffin closed on the penthouse at 220 Central Park South in New York City. The

$238m

price makes it America's most expensive home. Earlier this month, the billionaire paid about £95 million ($124 million) for a 200-year-old London home around the corner from Buckingham Palace.

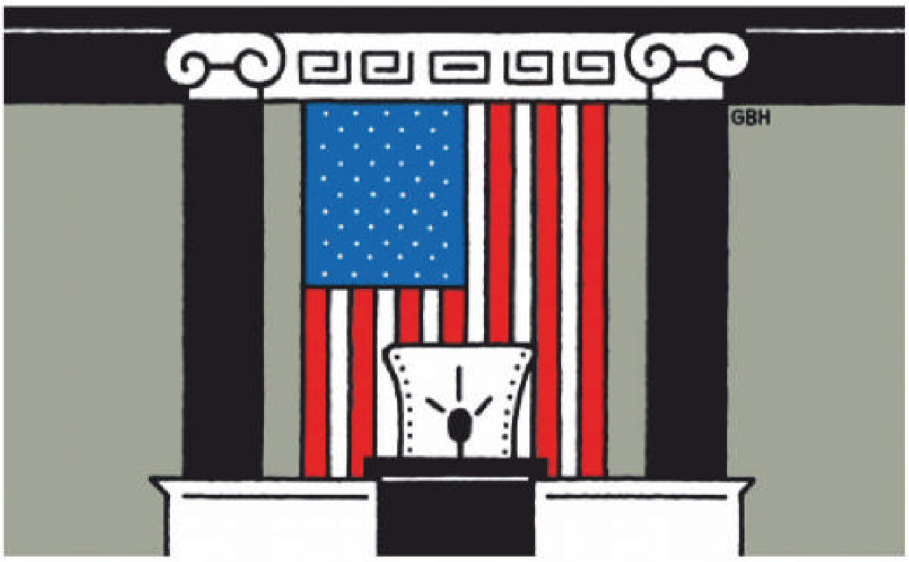
● Google News service may pull out of Europe in protest of copyright laws that would give original content providers a cut.

● *The Favourite* and *Roma* lead this year's Oscar nominations with 10 each, including best picture nods.

● The U.S. Federal Reserve is probing Deutsche Bank for its role in suspect transactions involving Denmark's Danske Bank.

● More than 800 asteroids may be on a collision course with Earth in coming years, the European Space Agency says.

DAVOS: MARKUS SCHREIBER/AP PHOTO. TYMOSHENKO: EFREM LUKATSKY/AP PHOTO. DATA: COMPILED BY BLOOMBERG



▶ The State of the Disunion

President Trump is searching for an alternative venue for his State of the Union address on Jan. 29, after Speaker Nancy Pelosi informed him that the House will not consider a resolution authorizing the speech before the traditional joint session of Congress until the government reopens.

▶ Apple reports its fiscal first-quarter earnings on Jan. 29. The start of the year has been dismal for the iPhone maker, which cut its revenue target on Jan. 2.

▶ The European Commission releases its economic sentiment index on Jan. 30 as fears rise of trade headwinds and a slowdown in Germany.

▶ The U.S. Federal Open Market Committee will announce its interest-rate decision on Jan. 30. A news conference with Chairman Jerome Powell will follow.

▶ Facebook's fourth-quarter earnings are due on Jan. 30. The social network giant is trying to shake off a year of scandals and slack growth.

▶ The U.S. releases data on fourth-quarter gross domestic product on Jan. 30, amid mounting signs that global economic growth is cooling.

▶ Need something for the mantelpiece? Sotheby's holds an auction on Jan. 31 in New York of 15th to 19th century portraits, still lifes, and landscapes.

■ BLOOMBERG OPINION

Don't Waste the Summit With North Korea

● If Trump wants a better result from his next meeting with Kim Jong Un, he'll need a different approach

U.S. President Donald Trump and North Korean dictator Kim Jong Un have agreed to meet for a second summit, perhaps in Vietnam, at the end of February. Agreeing to this was probably a mistake—and to have any hope of producing results, Trump will have to prepare much more carefully than he did last time.

There's been virtually no progress in meeting even the vague goals set out in the communiqué from the first summit, which was held in June in Singapore. North Korea has taken only cosmetic steps toward dismantling its nuclear and long-range missile programs while continuing to produce missiles and fissile material. And it's so far refused to provide an inventory of its arsenals—a minimum starting point for more detailed negotiations.

In addition, Trump goes into this summit weaker than before. He's battling a newly empowered opposition in Congress and assorted scandals. The coalition confronting North Korea looks increasingly shaky: Ties between South Korea and Japan are fraying, and China might withhold support to gain leverage in trade talks with the U.S. Meanwhile, leaders in Seoul and Beijing are eager to resume business with the North, undermining the "maximum pressure" campaign Trump insists will continue until North Korea denuclearizes.

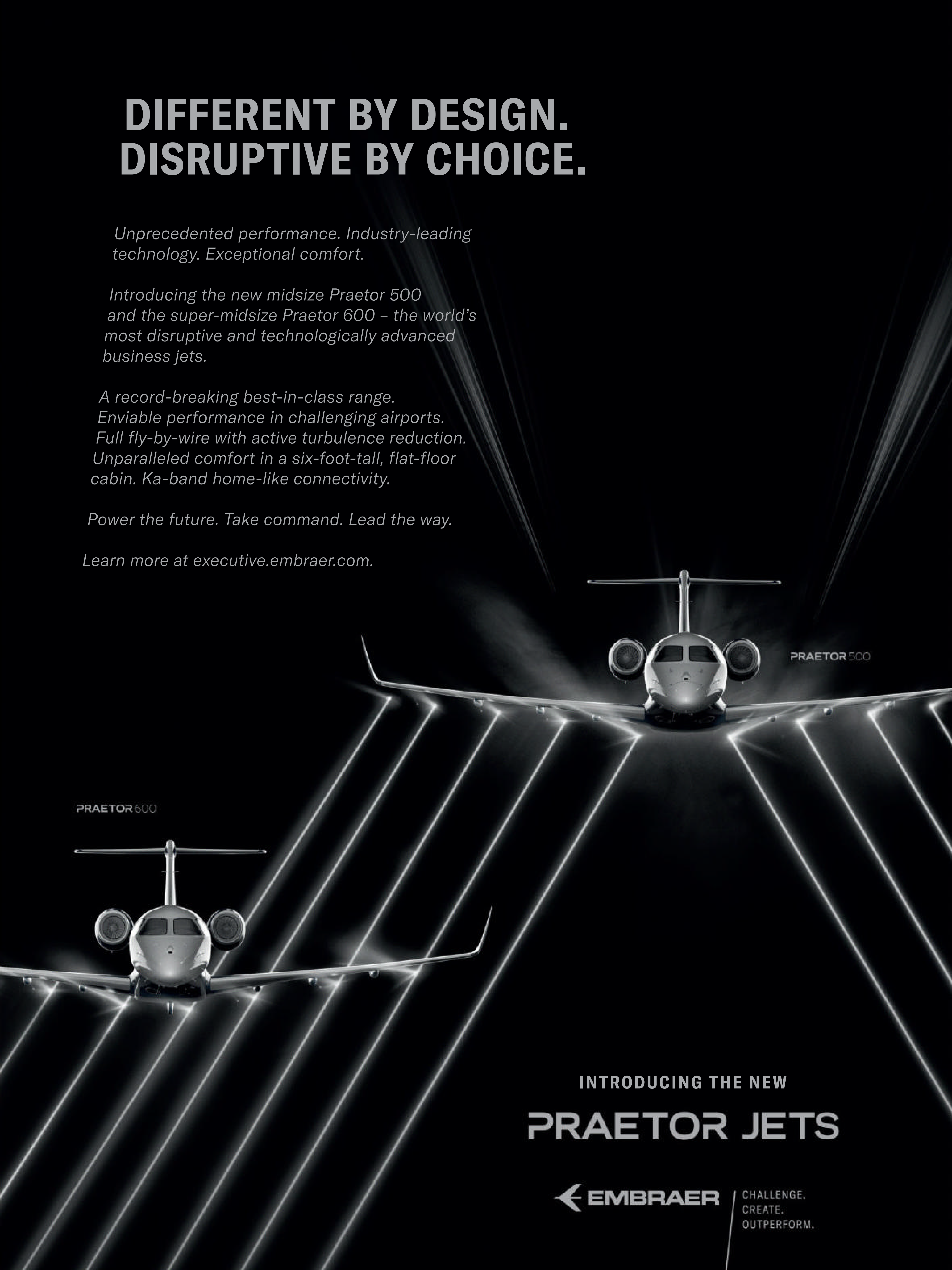
Given all this, there's a heightened risk that Trump will agree to any deal he can promote as a win. Some experts fear he may trade the U.S. troop presence in South Korea—for which he wants Seoul to pay more—for a ban on North Korean intercontinental ballistic missiles. That might reduce the immediate threat to the U.S., but it would leave the North a de facto nuclear power and make Washington's allies, Japan and South Korea, less safe.

For the U.S., the task remains to establish a plan to identify, cap, freeze, and eventually dismantle North Korea's nuclear and long-range missile capabilities. This may require some diplomatic creativity, for instance by splitting talks into two tracks, one focused on negotiating a peace treaty and the other on denuclearization. It will surely demand judicious concessions from the U.S. as well as the North—and close coordination among the U.S., China, Japan, Russia, and South Korea.

Trump needs to go into this meeting with a framework of this kind fully worked out. That will take diligent work by diplomatic staff—the kind of effort that the U.S. president tends to disdain. If Trump won't empower his aides to do what's needed ahead of time, he'd be wiser to deny Kim another public-relations win. Ⓑ

Written by the Bloomberg Opinion editorial board

ILLUSTRATION BY GINO BUD HOITING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● This Washington impasse is like no other. And the map for ending it must be charted through Trump's head

● By Joshua Green

As the record-long government shutdown barrels into its second month, you may have noticed that this stalemate differs from previous ones. Not only is it dragging on longer and causing more economic damage, it's also resisting the usual forces of resolution. Past shutdowns feel almost quaint by comparison.

There have been 10 since 1980, and two already during Donald Trump's brief presidency. By now, a familiar process has arisen through which these deadlocks resolve themselves: the combination of cable news clocks, tales of hardship, besieged lawmakers, and worsening poll numbers ratchets up pressure until one side or the other capitulates. That was the case with last year's Democrat-led shutdown, meant to force progress on the Deferred Action for Childhood Arrivals program, and also with the Republican one in 2013 that sought to block the Affordable Care Act.

It's not the case this time, at least not yet. From the beginning, the Trump-led shutdown over a border wall has been different. It effectively kicked off on live television when Trump staged a showdown with incoming House Speaker Nancy Pelosi and Senate Minority Leader Chuck Schumer and was then gulled into taking responsibility for what was about to happen. "I will be the one to shut it down," Trump boasted to a grinning Schumer. "I'm not going to blame you for it."

When government funding expired at midnight on Dec. 21, CNN and MSNBC rolled out the usual "shutdown clock" and reporters scrambled to find victims—not hard when 800,000 federal workers have had their paychecks halted. Furloughed workers and their families are lining up for whole city blocks to collect donated groceries. From airports to federal prisons, absenteeism is soaring. "This is uncharted territory, and with increased callouts citing financial hardship, this could have a compounding effect and force contingency plans at airports nationwide," says Michael Bilello, a spokesman for the Transportation Security Administration.

The economic damage has begun to register, too. The shutdown has crimped forecasts across Wall Street and brought on "emerging headwinds" that New York Federal Reserve President John Williams says could shave a full percentage point from first-quarter growth. The University of Michigan's latest consumer sentiment index dropped to the lowest level of Trump's presidency. Even the White House is sounding an alarm. Kevin Hassett, chairman of the Council of Economic Advisers, who initially likened the furloughs to "a vacation" that would leave workers "better off," reversed track on Jan. 15 and said the council's own estimates show the stalemate reducing growth by 0.13 percentage point for each week it drags on. A week later, he warned of zero growth if the crisis extends through March. "If the government shutdown continues," said Torsten Slok, chief international economist at Deutsche Bank, "it could cause a recession."

Despite all this, Trump doesn't sound as if he's about to relent. His poll numbers have worsened, but not dramatically. Members of Congress feel no compunction about leaving town. The president apparently even exhausted the cable news industry's capacity to sustain a ratings-boosting atmosphere of alarm: CNN's shutdown clock has vanished, while MSNBC, loath to give up entirely on a crisis that should be hurting the president, has swapped its clock for a more sedate calendar.

There can be no question we've passed into what a recent Goldman Sachs note calls "an era of political polarization, uncertainty, and dysfunction." With Trump's presidency entering Year 3, that hardly seems like breaking news. But as this crisis indicates, the dysfunction is different now. The virus has mutated.

There are two main reasons this shutdown has become a little scary—and together they should cause us to shift our appraisal of U.S. politics to something even more dire than it was before the showdown began. The first way this shutdown is distinct is that the president himself engineered it. Previous ones were always forced by the legislative branch to try to extract concessions—legal status for immigrants, reduced health-care spending—from a president of the opposing party. Such hostage-taking usually proved futile and ended in disappointment.

The trouble with a shutdown orchestrated by the legislative branch is that any U.S. president has formidable tools to heighten the disruption Congress causes—and can be blamed for. In 2013, for instance, Barack Obama closed national parks and erected barriers along the National Mall, frustrating tourists who'd come to visit the war memorials. Government agencies stopped publishing pricing data for livestock and commodities, throwing a wrench into those markets. By leveraging public anger over halted services against his Republican antagonists, Obama ensured the government wouldn't be shuttered for long.

Trump hasn't had to contend with the kind of pressure that soon came to weigh on prior instigators. In fact, rather than deploy his powers to dramatize the disruption, he's used them to an astonishing degree to mitigate its effects on the groups and industries he deems most likely to spark a backlash. His administration has ordered more than 400,000 federal employees back to work without pay to inspect planes, monitor food safety, and facilitate the sale of offshore oil-drilling rights. When it became apparent that the Internal Revenue Service wouldn't be able to process tax returns, Trump avoided the national furor of a middle class denied its refunds by forcing 46,000 IRS employees—salary-free—to do the paperwork. When the trade group representing farmers complained, the Department of Agriculture announced it ▶

◀ would bring back about 2,500 Farm Service Agency employees to help with loans and tax documents. It's not at all clear any of this is permissible. Environmentalists have complained about the legality of the Bureau of Land Management issuing at least 153 drilling permits since the shutdown began. The National Treasury Employees Union is suing the government for making IRS employees work without pay, arguing that the order falls outside the scope of activities permitted during a shutdown. "This administration is being creative in its ability to break the law and test the boundaries," says Sam Berger, a senior adviser at the Center for American Progress who once worked for Obama.

Regardless, Trump has largely succeeded—for now—in shielding most voters from inconvenience. A *Politico*/Morning Consult poll on Jan. 16 found that while there's widespread awareness of the shutdown, 66 percent of voters say there's been "not much" or "no" impact on them or their families.

The second distinguishing feature of this shutdown is that it hasn't produced the kind of immediate backlash that compels both sides to return to negotiations. A close look at public opinion surrounding the impasse and its central issue shows why: Post-midterm elections, the two parties have grown so polarized, and voters so tribal, that there's no meaningful "center" that Trump or Democrats risk losing. While Trump's overall popularity has drifted to the lower range of his presidency, at around 40 percent, Republicans haven't abandoned him. A Jan. 15 Quinnipiac University poll found that the president's approval with Republicans has increased 4 percentage points, to 86 percent, over the past month. That's buoyed his overall rating. "Despite very bad grades on honesty, empathy, leadership, and fitness to serve, President Donald Trump's granite-strong base keeps him above 40 percent," says Tim Malloy, assistant director of the Quinnipiac poll.

But the real effect is that voters' feelings toward Trump across the political spectrum have intensified during the standoff. Among all voters, Quinnipiac found, 33 percent say they "strongly approve" of him, while 50 percent "strongly disapprove." That doesn't leave many people in the middle.

The hollow center is even clearer in an electoral context. There's no longer a bloc of rural, blue-collar Democratic districts in the House whose representatives would pressure Pelosi to strike a deal funding Trump's wall—recent elections made them extinct. The midterms also wiped out most Republicans from educated suburban districts who might have crossed over to help Democrats end the impasse. A few woolly mammoths still roam Capitol Hill: GOP Senators Cory Gardner of Colorado and Lisa Murkowski of Alaska, both facing reelection next year, have voiced reservations about Trump's ploy and say they're willing to open the government without wall funding. But they won't make much difference.

As for Trump's border wall, it's grown more popular. The latest *Washington Post*-ABC News poll found 42 percent of respondents say they support it, up from 34 percent a year ago. But that puts little pressure on Democrats, because the increase came mostly from Republicans, whose support has grown larger and more intense. That intensity is mirrored in the opposition, which has allowed Pelosi and Schumer to insist the government reopen before negotiations recommence. "The wall has now morphed into a moral issue for Democrats," says Frank Sharry, executive director of the pro-immigrant-rights group America's Voice. "The wall has come to symbolize Trump's racism and xenophobia."

As the late economist Herbert Stein famously remarked, "If something cannot go on forever, it will stop." At some point, the standoff will end because the economic damage will compound to an unbearable point. For all its symbolism, Trump's shutdown has always been a big fight over a small number—the $5.7 billion he's demanding for his wall is about one-tenth of 1 percent of the total federal budget.

Whatever the resolution, whenever it comes, it shouldn't obscure the alarming dysfunction the standoff has exposed. Nor should the future implications go unheeded. In the past, the party that forced a shutdown always relented when the broad middle turned against it. Trump has already broken this mold, since, on the matter of a U.S. taxpayer-funded border wall, he never had the middle to begin with. He's not acting at the behest of his party, either. Senate Republicans already voted unanimously to fund the government without wall money and went weak-kneed only at his insistence. Rather, Trump's decision to close the government was driven by a desire to fortify his self-image as someone able to bend Washington to his will on the matter of greatest importance to his staunchest supporters: immigration. The fallout of this Fox News fantasy doesn't appear to weigh on him.

Perhaps he'll manage to secure funding by agreeing in the end to the obvious deal of trading DACA protections for it. But what if he doesn't? Does anyone imagine Trump will be satisfied to run for reelection with his central promise unfulfilled? Or will he seek out a new point of leverage, one that Democrats can't exploit as easily as the current shutdown?

On March 1 the U.S. debt ceiling will be reinstated. By late summer the Treasury Department's "extraordinary measures" will be exhausted and the government's borrowing authority will run out. House Democrats have already changed their rules to make raising the debt ceiling easier. But ultimately, it's up to Trump. Let's say he's forced to make a humiliating climbdown in the current impasse. What's to stop him from, say, refusing to raise the debt limit without wall funding in return?

It wouldn't be fear of alienating centrist voters, or damaging political norms, or making a move that's economically counterproductive, as the free traders in his administration can wearily attest. Maybe a plunge in the Dow causes him to relent. Or maybe it doesn't. Every day that the current stalemate drags on is a new measure of Trump's stubborn force of will—and a reminder that the old safeguards no longer apply. Ⓑ *—With Jennifer A. Dlouhy, Christopher Flavelle, Hailey Waller, Anna Edney, Alan Levin, Laura Davison, and Francis Wilkinson*

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Brexit May Make This Beer Go Flat

● BrewDog is a U.K. craft beer success story. But life outside the EU could slow its momentum

Twelve years ago, James Watt was fishing for mackerel and halibut on a commercial trawler off the northeastern coast of Scotland. He had a dog, a modest paycheck, and few prospects in a region in decline. Today, Watt is worth $337 million and jets from Europe to Asia to the Americas managing one of the fastest-growing ventures in the U.K.

He didn't make his fortune as a tech entrepreneur or a securities trader. He and his business partner, Martin Dickie, produce craft beer. Their company, BrewDog Plc, is known for its zesty "punk" ales and over-the-top publicity stunts: The two founders once drove a World War II-era tank through the City of London waving banners displaying their company logo, a yelping dog.

BrewDog is one of the few bright spots in a country caught in the malaise of Brexit. The company is valued at £1.7 billion ($2.2 billion) after its latest crowdfunding round and the 2017 sale of a 23 percent stake to a U.S. private equity firm. Its revenue soared 60 percent in 2018, to about £179 million, as it notched another year of net profits. And BrewDog, which sells beer in 60 countries and owns more than three dozen bars and restaurants in the U.K., has created more than 1,200 jobs in Britain.

But on a January afternoon at the company's brewery on a windswept stretch of the Scottish coast, Watt's mood sank when the subject of Britain's departure from the European Union came up. Even as his employees were cranking up production on a £4 million addition to their facility, British lawmakers 560 miles to the south were clashing in a political endgame that could see the country quit the bloc on March 29 with no transition plan in place. Watt dreads that scenario. BrewDog sells more than a third of its volume in mainland Europe, and he worries the sudden imposition of tariffs and duties—not to mention customs delays—could spur supermarkets and bars to reconsider whether to carry its products. "So much of the beer we make here ends up in France and Germany and Spain and Italy, so for us that

Edited by
James E. Ellis

◀ Co-founders Watt and Dickie at their flagship brewery in Scotland

would be doomsday," Watt says. "I might just go live in America."

He's only half-joking. Watt and his management team have been weighing several plans for dealing with a hard Brexit, from asking European partners to temporarily share brewing capacity to building a plant in an EU nation. He's even contemplating shipping beer from BrewDog's two-year-old U.S. brewery in Columbus, Ohio. "Everything is on the table," says Watt, the chief executive officer.

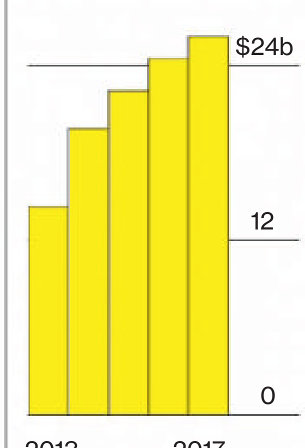
The turmoil around Brexit is hitting just as BrewDog is opening the tap on many new ventures. It's building a brewery in Brisbane, Australia, and plans another in China. The company is opening restaurants in Indianapolis and Cincinnati, and is eyeing locations in Shanghai and Kuala Lumpur. It plans to unveil its own Scotch whisky this year. By the end of January, BrewDog was expected to introduce a line of "sour beers" from a new facility at its Scottish base. Watt is betting these fruit-infused brews, which ferment in wine and whiskey barrels instead of stainless-steel tanks, will become the next big thing in the craft beer craze sweeping the U.K. and Europe.

Until Brexit, BrewDog's biggest challenge was making sure it didn't overreach. The company is making a huge push in the U.S. just as the craft beer boom is slowing there. Sales of high-end beers from independent brewers are expected to grow about 6 percent in 2018, after double-digit annual increases in the previous three years, according to the Brewers Association, the U.S. industry trade group. That could be a preview of what's to come in the U.K., where craft beer volume edged up 1.7 percent in 2017. Beverage industry players there fret that craft beer may be hitting a saturation point, given the flood of expansion in the segment. The number of breweries more than doubled from 2010 to 2017, to 1,930, according to the British Beer & Pub Association. And corporate giants are elbowing into the action. Last June, Heineken NV acquired a £40 million stake in London craft beermaker Beavertown Brewery Ltd. "Lots of breweries are all competing for the same segment of the market, and big brewers are taking what would have gone to smaller ones," says Neil Walker, head of marketing at Britain's Society of Independent Brewers.

"So much of the beer we make here ends up in France and Germany and Spain and Italy"

Watt shrugs off such concerns. "We're not too worried about demand if it's something we're passionate about," he says. "Our business plan has always been death or glory." He and Dickie have taken that let-it-rip attitude ever since they started whipping up beer batches in 2007, inspired by the hoppy pale ales of California. They filled bottles by hand, sold their brews at farmers markets, and burned through their savings. Then in 2008 the two 24-year-olds made a breakthrough when their beers took first place in a contest sponsored by Tesco Plc, Britain's biggest supermarket chain. Told they'd just won shelf space for 2,000 cases a week, Watt didn't blink and promised to deliver. The pair wrangled a £20,000 loan from HSBC Holdings Plc, bought some equipment, and dubbed their flagship offering Punk IPA. They vowed to fight the "insipid, artificially flavored offerings" of corporate behemoths such as Anheuser-Busch InBev NV. An early user of crowdfunding, BrewDog went on to raise £67 million from almost 100,000 "equity punks" and leapfrogged big pub chains to open their own bars.

● U.S. craft beer sales



BrewDog caught the market just as Brits, especially younger drinkers, were discovering the bracing tropical-tinged flavors that turned American craft beer pioneers such as Sierra Nevada Brewing Co. and Boston Beer Co., the maker of Sam Adams, into industry-changing forces worth billions of dollars. But what truly propelled the company was its gonzo marketing. To claim the ▶

BREWDOG: COURTESY BREWDOG. DATA: BREWERS ASSOCIATION

◀ title of world's strongest beer from a German brewer, Watt and Dickie made Sink the Bismarck, a "quadruple IPA" with an alcohol-by-volume level of 41 percent. And they projected 60-foot-high naked images of themselves onto the Houses of Parliament to trumpet their plan to "take the craft beer revolution to the next level" (a BrewDog sign covered their private parts). Sometimes their antics flopped: In 2018 they released a beer called Pink IPA in a rose-colored can that was supposed to show support for gender equality but struck many as condescending. "People in the industry can't stand these stunts," says Will Bucknall, co-founder of Kicking Horse, a U.K. craft beer distributor. "But they hit the mark for their equity punks, and they increase the adoration of the brand."

Rather than trying to just sell craft beer, the company also works hard to market a roguish lifestyle. The online BrewDog Network features beer-themed content such as the quiz show *Are You Smarter Than a Drunk Person?* Last year the company opened a hotel next to its Ohio brewery called the DogHouse that features taps in its 32 rooms, beer-infused soaps, and even well-stocked brew fridges in the bathrooms. "They've created this elusive brand equity that's based on more than enjoying their beer," says Spiros Malandrakis, a beverage industry analyst with market researcher Euromonitor International. "With BrewDog, you can drink a beer in the shower at their hotel."

BrewDog's strong branding was a big reason why TSG Consumer Partners, a San Francisco-based private equity firm that's pumped money into consumer-focused brands including Famous Amos, Vitaminwater, and Planet Fitness, invested $128 million in the company in December 2017. Despite his ubercool public image, Watt is steeped in the details of his business. His office suite features a replica of the beer shelf at a nearby Tesco supermarket so he can evaluate how the labels on his products stand out next to those of rivals. Still, he says, BrewDog remains true to its artisanal roots and will never sell out to a big brewer. "For us, the bigger companies are responsible for the bastardization and commoditization of beer, which is everything we're against," he says. Asked how he squares that with the TSG deal, Watt points out that iconic U.S. players such as Southern California's Stone Brewing Co. have also tapped buyout funds. "That just helps us compete without having to sell our souls." *—Edward Robinson and Thomas Buckley*

THE BOTTOM LINE BrewDog, the U.K.'s largest craft brewer, sells more than a third of its beer volume in mainland Europe. Tariffs and added time for border crossings could hurt business.

Big Pharma's Efficiency Drive

● A third of drug-development costs comes from patient studies. Novartis wants to make them cheaper

Discoveries of new cancer-fighting and antiviral medicines grab headlines and sometimes win Nobel Prizes. But after the breakthroughs and backslapping are over, Big Pharma's grunt work is just beginning.

Companies carry out years of costly studies to prove treatments are safe and effective: finding hospitals and clinics to participate, hunting down patients who fit precise descriptions, tracking their health in minute detail for years while ensuring they take their medications, and then combing through heaps of data that will determine whether doctors can prescribe them. It's the unsexy side of the industry, and it's a big reason it can take more than $2 billion and 12 years to launch a new treatment.

Drugmakers "do an excellent job of drug discovery," says Justin Hoss, a consultant at KPMG who specializes in technology and life sciences. "Then they get to a point of doing clinical trials, and it's a big bottleneck. The faster they get people through clinical trials, the faster they're going to know whether their investment was worth it or not."

Pharmaceutical products have a limited time under exclusive patents, and the majority of drugs

● Typical development cost for a major new drug

$2b

▼ Novartis's high-tech command center in Basel, Switzerland, tracks its global drug trials

STEFAN WERMUTH/BLOOMBERG. DATA: COMPILED BY BLOOMBERG undergo delays during human testing. French drugmaker Sanofi estimates that as many as 7 out of 10 trials are hit by enrollment snags. Every extra week getting to market subtracts about $300,000 from sales before cheaper copies emerge, according to TriNetX Inc., a Cambridge, Mass.-based company that helps drugmakers speed up trials. Stung by such setbacks and feeling pricing heat from insurers and health systems, companies from Novartis AG to Sanofi to AstraZeneca Plc are turning a microscope on the efficiency of their drug trials. The area is "completely ripe for disruption," Hoss says.

Trying to streamline an operation that spends more than $5 billion a year on developing new drugs, Novartis dispatched teams to jetmaker Boeing Co. and Swissgrid AG, a power company, to observe how they use technology-laden crisis centers to prevent failures and blackouts. That led to the design of something that looks like the pharma version of NASA's Mission Control: a global surveillance hub where supercomputers map and chart Novartis's network of 500 drug studies in 70 countries, trying to predict potential problems on a minute-by-minute basis.

If a trial shows up in red on the wall of flatscreen displays—signaling a risk to the schedule—the company can swing into action and make sure it stays on course. A key concern is whether trials are attracting enough patients to get a complete reading of a drug's safety and efficacy or other trial objectives. It's among the most frustrating parts of the process, often taking 18 months or more for late-stage studies. Novartis plans to reduce the time it takes to fill a trial's patient ranks by as much as 15 percent.

The traditional approach was taking "way too long for our patients, and way too long for the economics of the business," says Bertrand Bodson, a veteran of Amazon.com Inc. and other retailers who came to Novartis last year to head technology. "We wanted to modernize that."

Many companies are betting that tech advances will pay off in quicker patient studies, which typically account for a third of the time and cost it takes to bring a treatment to market. Keeping trials that span the globe on schedule can be a struggle. A delay at just one clinic can disrupt the entire operation, says Heather Bell, head of digital and analytics for Sanofi.

"You are only as fast as your slowest site," she says. "We're looking at literally every stage of that development funnel in order to figure out how we can do it better and faster and, ideally, in a less costly way."

Researchers sometimes unwittingly build delays into their study designs, setting requirements for enrollment—age, other health conditions, previous treatments—that can shrink the potential pool of volunteers. Also, study sites may simply be located too far from entrants, or patients may not even hear about the opportunity to join an investigation. Those problems can force drug companies to make expensive changes to the experiment's original blueprints. "Historically, trials have been designed in a very manual way, based on hunches, and not data-driven," says Gadi Lachman, chief executive officer of TriNetX, which taps information from hospitals, clinics, and other sources to predict how fast a pharmaceutical study will enlist patients.

Companies across the industry are turning to TriNetX for help prospecting for patients before their studies begin. That can circumvent costly, time-wasting alterations, Lachman says. The goal is to shave one to three years off the time it takes to get a drug to market.

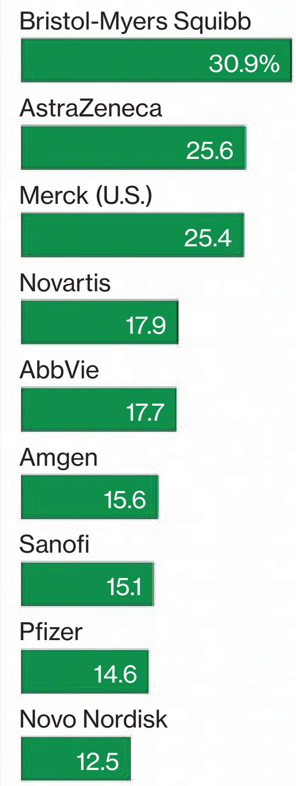
Increasingly, mobile devices are allowing people to participate from their own homes, making studies more convenient—and reducing the likelihood that candidates will drop out because they don't want to travel to study centers for data collection. Sanofi is planning to use smartwatches to track movement throughout the day in subjects with Parkinson's disease. Remote blood pressure cuffs, glucose meters, breath-analyzing devices, and other monitoring gadgets allow researchers to assess patients from their own kitchens, says Cristina Duran, who leads efforts to revamp drug development at U.K.-based AstraZeneca.

Better management of studies becomes particularly necessary as some investigations try to follow very large patient groups. Novo Nordisk AS, for example, is tapping 17,500 patients to evaluate the heart benefits of an experimental medicine to treat obesity. That's the biggest trial in the Danish company's history.

One way or another, pharmaceutical product testing has to be transformed from a cumbersome process with thousands of Excel spreadsheets and disparate databases into something more integrated and advanced, says Badhri Srinivasan, Novartis's head of global development operations. "You are putting out fires," he says. "It's not a sustainable way to run clinical trials. We just can't keep doing things the way we have." *—James Paton*

THE BOTTOM LINE Big drugmakers can spend about $2 billion and take as long as 12 years to develop a medicine. Now some are trying new technology to make the process more efficient.

● Research and development expenditure as a share of revenue in 2017



Japan Gets Serious About Flying Cars

The country's once-famed government skunk works has set its sights on aerial taxis and trucks. It has some catching up to do

Japan often appears stuck in yesterday's vision of tomorrow. Flip phones remain common. Yahoo! remains a wildly popular website. Tokyo of the 1980s may have inspired the futuristic cityscape of *Blade Runner*, complete with flying cars, but the fax machines that were cutting-edge when that film came out remain ubiquitous in Japanese offices today.

Ensuring that Japan doesn't fall behind the technological curve has been the job of the Ministry of Economy, Trade, and Industry, a powerful agency housed in a squat modern office block in Tokyo's orderly government quarter, a few blocks south of the jagged moat surrounding the Imperial Palace. The building is orthogonal in every respect, a uniform stack of concrete threaded with long, featureless corridors. The bureaucrats here guided Japan's postwar economic miracle, a boom that gave the world the transistor radio, the Walkman, the Prius—and almost no transformative innovations since. None of the automakers championed by METI—still better known abroad by its previous acronym, MITI—is today on the leading edge of autonomous driving. Japan's faded tech companies can't lay claim to either smartphone or internet greatness.

Not long ago, Fumiaki Ebihara began worrying from his desk inside METI that Japan risked being wedded to another antiquated practice: traveling on solid ground. The flying-car future is coming, he wagered, and Japan could realistically figure it out first. He's since put himself at the center of what might be the world's most comprehensive government effort to understand and encourage flying cars, defined as electric-powered vertical takeoff and landing vehicles that will ultimately be largely or fully autonomous, as a way to revamp everyday mobility. This effort has so far produced a national road map for flying-car development embraced by industry leaders and set up a government structure to define and advance regulations. If all goes well, Ebihara believes the skies of Tokyo could be traversed with aerial taxis and delivery trucks by the late 2020s.

"Compared to other countries, Japan already has many of the strengths we'll need for flying cars," Ebihara says in a METI conference room. He's a slight 33-year-old with a thatch of spiky hair, stylishly rounded glasses, and a habit—still unusual for Japanese bureaucrats—of appearing tieless in public. Just behind him is a framed poster depicting a Boeing jet soaring above a Japanese temple, over the slogan "Made With Japan," a reminder that while the country makes few aircraft of its own, its aerospace industry is a significant provider of components for those assembled elsewhere. "Mass production, materials science, battery technologies, systems integration—we have all the ingredients," he says. "This is a big chance for us."

The members of Japan's small, passionate flying-car community are mostly young, English-speaking, and dismissive of the sclerotic orthodoxies that have kept their country from seizing recent opportunities. They also believe they have a genuine shot at assuming global leadership. Prime Minister Shinzo Abe's government, eager to reinvigorate the economy and sell a fresh national image in time for the 2020 Olympic Games in Tokyo, says it's fully behind them.

But Japan's recent record of providing a hospitable environment for disruptive ideas is abysmal, even when political will exists, contributing to lost decades of economic growth. Local and national regulations have severely restricted Airbnb Inc.; thanks to ferocious opposition from taxi companies, ride-hailing apps have never arrived in force. Japan's flying-car advocates intend for it to be ▶

Edited by Jeff Muskus

ILLUSTRATION BY WOSHIBAI

◀ possible, in less than a decade, for anyone in Osaka or Sapporo to summon a flying Uber at the tap of a smartphone. Today it's difficult even to hail one on wheels.

At the time he began conceiving of the government's flying-car initiative in 2017, Ebihara was an unknown midlevel METI staffer whose job was to liaise with aircraft manufacturers. In one of those discussions, what he'll describe only as "a large aerospace company" briefed him on its plans to develop an airborne taxi and wanted to know about Japan's policies. He was befuddled: For the most part, Japan didn't have any.

In fairness, relatively few government agencies anywhere have begun coming to grips with what it will take to regulate flying cars. While Dubai, Singapore, and New Zealand have expressed similar intentions to be first movers—the latter entering a partnership with Google co-founder Larry Page's Kitty Hawk Corp.—larger countries with more complex airspace are moving gradually. The U.S. Federal Aviation Administration told attendees at a May flying-car summit convened by Uber Technologies Inc. that they may need to lower their expectations for the speed at which regulators will greenlight the vehicles. The same agency still hasn't finalized rules that would allow drones to be operated at night or above crowds. In the U.K., meanwhile, relatively liberal regulations on drones haven't translated into an enthusiasm for stuffing them with people, and the country is likely to become more restrictive after recent drone fiascoes at two London airports.

Even at METI, Japanese bureaucrats are a conservative bunch, and flying cars were a hard sell for Ebihara. "At first they didn't believe it was important," he says of his bosses' attitude toward his idea. "But they saw the logic eventually."

Japan might have greater-than-average incentives to move fast. It's regularly walloped by earthquakes and typhoons that make passage by road difficult or impossible. It's extreme in geography, too, with well over 400 inhabited islands and hundreds of hard-to-reach alpine villages. Navigating the congested cities on its four main landmasses by car is difficult: A drive from central Tokyo to the capital's main international airport, Narita, can take two hours.

The government unveiled its flying-car program last August, with partners that included Airbus SE and Boeing Co. as well as domestic players such as Yamato Holdings Co., Japan's largest delivery operation, and the carmaker Subaru—known at home not only for sensible station wagons but also for its work assembling Apache attack helicopters. Despite its difficulties in Japan, Uber was also on board, and the government is hopeful that the U.S. company will choose Tokyo as a test bed for its flying-car program, Uber Air. The idea is for these corporate partners to collaborate with bureaucrats on developing a comprehensive plan to safely deploy and regulate flying cars across Japan, with test flights beginning as soon as this year.

Yet rather awkwardly for an ostensible effort to vault Japan to the forefront of the nascent flying-car industry, almost none of the Japanese participants is building or planning to build flying cars. Many of the relevant innovations will come from foreign companies: Airbus, Uber, and Bell Helicopter are all working on vertical takeoff and landing vehicles

● A rendering of the Cartivator two-seater prototype

▼ In many ways, Japan's flying-car efforts seem like they're just getting started

CLOCKWISE FROM BOTTOM LEFT: KOJI UEDA/AP PHOTO; SOURCE: CARTIVATOR; AKIO KON/BLOOMBERG; PHOTOGRAPH BY SHIHO FUKADA FOR BLOOMBERG BUSINESSWEEK; DATA: MORGAN STANLEY suitable for urban environments. Most of Japan's homegrown contenders are aiming at providing smaller components, such as batteries, control software, or air traffic services.

There is at least one Japan-made flying-car prototype, and it just recently received permission to leave its warehouse near Nagoya, the nation's traditional aerospace capital. It's a rough version of a planned two-seater craft, three-and-a-half meters long and just over a meter high, capable of vertical takeoff on four helicopter blades mounted on legs that protrude slightly downward from the fuselage like pontoons. Getting signoffs from Japan's Civil Aviation Bureau for outdoor flights was a laborious process for Cartivator, a collective of Tokyo- and Nagoya-based engineers.

"Regulation here is strict and conservative, and Japan does not have a lot of experience building whole aircraft," co-founder Tsubasa Nakamura says in an interview at a train station cafe in Tokyo's western suburbs, as salarymen in their usual matching black suits file past on the way home. "Developing a flying car here is not easy."

Nakamura started Cartivator in 2012 while working as an engineer at "a major Japanese automotive company" and has been fascinated by the notion of a flying car since seeing *Back to the Future* as a kid. (At one point he set out to calculate the feasibility of a flying DeLorean.) After trying to develop the concept at his day job, he concluded it was impossible within the confines of a risk-averse industrial giant and left last year to work on his passion project full time.

Cartivator isn't a startup. It's a volunteer organization with more than 100 members who contribute up to 20 hours a week of spare time and receive modest funding from Toyota Motor, Panasonic, and NEC, among others. "Venture capital money in Japan is not so easy to get at the scale you need" for a hardware business, Nakamura says, let alone one in the capital-intensive world of flying machines. "Engineers tend to remain in the big companies, so a volunteer model is an easier way to do it."

But flying cars need to be a business in the end, so Nakamura and a co-founder, Tomohiro Fukuzawa, created a spinoff company, Skydrive, that has raised about $3 million in venture funding. That's a small fraction of what Nakamura says he'll need to accomplish his medium-term goal: using a flying car to light the Olympic torch at the Tokyo 2020 opening ceremony.

Still, it wouldn't be fair to say that Japan's major corporate players are ignoring flying-car development. One of the more enthusiastic is Yamato, a century-old logistics concern. Last year it began a partnership with Bell, a unit of Textron Inc. that builds aircraft including the U.S. military's V-22 Osprey, to roll out futuristic helicopters to make deliveries in urban areas.

"Yamato must be the leader in this field," says Shinji Makiura, the company's managing executive officer for transformation and open innovation. "If someone else does it, we're going to be disrupted." The urgency is in part a product of persistent labor shortages that all Japanese companies face as low birthrates shrink the country's population. "We have to learn to operate with less people," Makiura says.

The company, which delivers some 1.8 billion packages annually, is planning a test flight this year and an entry into service in the mid-2020s. The chief researcher on the effort is rail-thin Yu Ito, 28, who was working as a management trainee when Makiura spotted a copy of his graduate thesis on the technical feasibility of flying cars. Ito soon had a team, a budget, and an enthusiastic partner in Bell—a rise that might have taken decades to pull off in a traditional Japanese hierarchy. "Many of the basic problems"—scheduling, network management, cost containment, and the like—"are ones we're familiar with," Ito says. Then he chuckles: "The challenge is that we've never been airborne."

For cars to fly in Japan, they'll have to overcome a force that can be just as fundamental as gravity: other arms of the state bureaucracy. Japan's safety culture is perhaps the most pervasive and uncompromising on Earth. Not for nothing do white-gloved attendants stand sentinel at construction sites, watching intently lest a passing pedestrian trip or stub a toe. Since the crash of a Japan Airlines 747 in 1985, no Japanese carrier has had a fatal air accident; in some 50 years of operation the Shinkansen bullet-train network has never experienced a serious collision or derailment. But it seems inevitable that as flying cars are adopted some will crash, perhaps fatally—a scenario that could sorely test enthusiasm for moving faster than other countries.

"We cannot compromise on the safety of flying cars—whether the aircraft, the riders, or the people around the vehicle," says Masafumi Ohi, a deputy director in the Airworthiness Division at the Ministry of Land, Infrastructure, Transport, and Tourism. "It's not about being unwilling to challenge conventions, but you can't just sacrifice safety in the pursuit of convenience, especially in city centers." *—Matthew Campbell, Jie Ma, and Kiyotaka Matsuda*

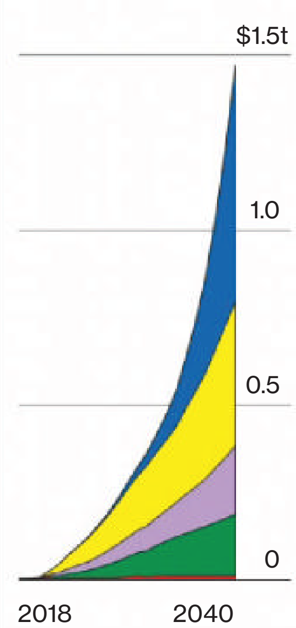
THE BOTTOM LINE Japan's economy ministry is lining up resources to develop the nation's flying-car industry, but its early efforts are just starting to get off the ground.

● Nakamura

● Ebihara

● Global market for flying cars, according to Morgan Stanley projections

■ Autos/shared mobility
■ Transport/logistics
■ Enabling tech
■ Airlines
■ Military/government



A Different Conception Of Privacy

● More than 100 million women monitor their cycles on their phones. Here come the ads

Sarah Martin, a Berlin-based aid worker who specializes in women's issues, used to track her periods in the same paper planner where she wrote down her work appointments. Sometimes she'd also draw a little heart for the days she'd had sex. Nowadays she uses a smartphone app to track her cycle, because "the app feels more private and discreet," she says, even though she realizes it's probably not.

Martin is one of more than 100 million women around the world who each month use free menstruation-tracking apps with such names as Flo, Glow, Ovia, and Clue, and may want to be warier about that. Some women use these apps to help them get pregnant or avoid pregnancy; others simply to get a better handle on what their bodies are doing. In any case, the apps have built in a wide variety of other health-tracking features, too, and most are widening their use of the data they collect to make money, betting they'll be able to build business models off this extremely sensitive data.

Apps don't have to meet the privacy standards of, say, doctors or hospitals. They also aren't always right. See Natural Cycles, a U.S. Food and Drug Administration-approved app that drew criticism last year after women in Sweden reported unwanted pregnancies while using it. Swedish health regulators asked the company to more clearly disclaim that it doesn't promise 100 percent accuracy.

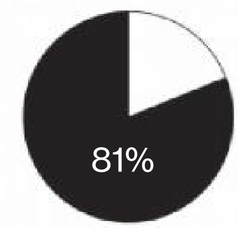
"No two cycles are exactly the same, even in the same woman," warns Anna Glasier, a leading contraception researcher at the University of Edinburgh. An app "does nothing but rely on people not having intercourse at a certain point in the cycle. And we know that doesn't work very well." Natural Cycles said in a statement that it's typically 93 percent effective, based on a study of about 22,000 women.

Some period-tracking apps ping you with requests for more data (when did you last have sex? did you use an ovulation test this month?) or suggest exercises (help keep your breasts young and perky!). Combined, the apps have raised at least $350 million over the past several years. Flo leads the U.S. market, with about 6 million of its 28 million monthly users located in the States.

Belarusian twins Yuri and Dmitry Gurski started the company in Minsk in 2015 and have refined the app to let women record their moods, sex drive, even pimples, as well as basal body temperature measurements that can help pinpoint ovulation. The company says it has collected more than 13 billion data points, and its team of 15 data scientists sift the data for patterns. Based partly on their conclusions, the app monitors irregular periods and sends an alert when a user is likely to conceive. "A lot of people have thanked me after the app helped their family get pregnant," Yuri Gurski says.

The brothers' background wasn't exactly in women's health: They made their name selling Google and Facebook Inc. a pair of viral photo apps, one of which morphed users' faces into those of Stalin or Leonardo DiCaprio. Yet by last summer they were selling targeted ads to Procter &

● Percentage of 108 free period-tracking apps that returned at least some inaccurate predictions in a 2016 survey



FROM LEFT: ILLUSTRATION BY CRISTINA DAURA; SOURCE: AUGMEDICS. DATA: MOGLIA M.L., NGUYEN H, CHYJEK K, CHEN K, CASTAÑO P: "EVALUATION OF SMARTPHONE MENSTRUAL CYCLE TRACKING APPLICATIONS USING AN ADAPTED APPLICATIONS SCORING SYSTEM." OBSTETRICS & GYNECOLOGY

Gamble Co. and Bayer AG. A quiz backed by Bayer, which sells a type of intrauterine device that can regulate heavy period flow, prompts users to think about whether their menstrual bleeding is unusually heavy. "You can really bring the right content to the right place," says Bayer physician Cecilia Caetano. A Flo-using teenager might get ads on tampon use, while a 30-year-old might be pitched ovulation tests.

Flo says it's already profitable if you don't account for marketing expenses and that a subscription model it rolled out in the fall shows promise. So far, about 3 percent of users have signed up to pay as much as $10 a month for extra articles and data.

Glow, backed by PayPal co-founder Max Levchin, began marketing in vitro fertilization directly to users about a year ago. Ovia is pitching a paid version of its app to insurers and large employers who want a heads-up on how many of their members or employees want to conceive. Both companies are certified compliant with U.S. patient privacy rules and say they don't sell data to third parties.

Ida Tin, chief executive officer of Clue, Flo's biggest Western rival, says she strongly opposes running targeted ads, which she deems invasive. Although Clue's terms of service allow user data to be shared with academic researchers and don't explicitly rule out commercial use, the company has promised not to go that route. "My dream is that people will read the terms of service," says Tin. "I don't have to optimize every little thing I do and sell my data left and right...that's not why I'm doing this."

Her app is heavy on analytics, letting women track health problems that may be linked to their periods–everything from constipation to depression–and charging about $1 a month for more data analysis, including a feature that predicts upcoming symptoms based on previous ones. Clue wouldn't say how many of its more than 10 million users have subscribed. Tin says the investors who've supplied $30 million in capital are patient.

So far, Clue appears to be the exception. Barring some form of regulation, the market is likely to keep sliding toward ever-more-intensive data mining. In China, women seem fine with that, says Chai Ke, CEO of Dayima (slang for "menstruation") in Beijing. His service crunches deeply personal information with permission from users. "If you know where I'm living, and I'm pregnant, and which hospital I'm giving birth in, and your salesman approaches me as I'm coming home from the hospital," he says, "then that's a problem." —*Naomi Kresge, Ilya Khrennikov, and David Ramli*

THE BOTTOM LINE None of the popular apps meant to track women's periods has to meet the same reliability or privacy standards that medical professionals do.

Innovation Xvision

Augmedics' surgical "X-ray specs" are really an augmented-reality headset that superimposes CT scans and other images over a patient's body, helping surgeons map an operation without looking away.

Innovator

Nissan Elimelech
Age: 41
Chief executive officer and founder of Augmedics, a 17-employee startup in Yoqneam, Israel

Origin

While working as a sales rep for Medtronic Plc, Elimelech, a biomedical engineer by training, saw the need for a surgical navigation system that doctors could use while keeping their eyes on the patient. He founded Augmedics to develop Xvision in 2014, aided by display maker Lumus Ltd.

Funding

Augmedics has raised $9 million from investors including Terra Venture Partners and AO Invest AG.

Customers

Elimelech says Augmedics plans to sell Xvision to hospitals at prices comparable to conventional surgical navigation systems, about $200,000 to $300,000.

How It Works

❶ A surgeon places a reference marker on a patient before performing a 3D scan, then loads the images into the system's workstation. The surgeon puts on the Xvision headset, which contains two eyeglasslike displays, a processor, and an infrared camera.

❷ The system uses the reference marker to align the images, giving the surgeon the illusion of peering into the patient's body. Separate markers attached to the handles of surgical instruments help update the AR view in real time, enabling images representing the instruments inside the patient.

Next Steps

Clinical trials are under way in Israel, and Elimelech says he expects the U.S. Food and Drug Administration to clear Xvision for spinal surgery in early 2019. —*Michael Belfiore*

You ca the ma

● Jack Bogle's index fund transformed investing—and maybe corporations, too

Vanguard Group founder Jack Bogle, who died on Jan. 16 at age 89, ushered in an era of low-cost investing for the many. He launched the first index mutual fund for individual investors at the end of 1975 for the purpose of passive investing: Skip the stockpicking, save on fees, and simply ride the ups and downs of the overall market. His fringe idea has become mainstream. Sometime this year, analysts at Morningstar Inc. say, assets in passively managed U.S. equity funds are likely to surpass assets in actively managed ones. By pushing down fees across the industry, Bogle may have saved American investors $1 trillion over his lifetime, calculates Bloomberg Intelligence analyst Eric Balchunas.

Bogle theorized that you can't reliably beat the market, so you might as well join it and settle for average performance. So far, so good: Through August, only 17 percent of actively managed funds in the U.S. "large blend" category had beaten the performance of their passive peers over 20 years.

Something peculiar has happened along the way, though. Today, much of the investing that's tied to indexes is passive in name only. Investors in many index funds aren't content to go with the flow like rubber ducks on a river. Instead of trying to beat the market by picking stocks, they're trying to do it by picking indexes. They've been aided in this by the rise of exchange-traded funds, which now hold $3.5 trillion in assets in the U.S. Most ETFs are considered passive because their managers don't have discretion in choosing stocks, but they've allowed investors to bet on almost every conceivable sector, asset type, and geographic region. (Bogle called ETFs "a bastardized form" of index funds on a Bloomberg podcast last year.)

According to the Index Industry Association, more than 3.7 million indexes exist—and though most don't have funds tracking them, it goes to show how flexible the idea of passive management has become. "Indexes have mutated into a form of what they've long been used to judge: active management," Ben Johnson, director of global ETF research for Morningstar, wrote in a column on Jan. 18.

"Smart beta" funds are another way investors are becoming less passive while still taking advantage of the cost savings and automaticity of indexing. Instead of holding shares of companies in proportion to their market value, a smart beta fund holds them in proportion to some other measure such as sales, dividends, or book value. The goal, again, is to beat the market—this time by exploiting factors that seem to help investors outperform over time, such as having a low stock price in relation to book value. It used to be that only stockpickers tried to do that. Smart beta funds have more than $800 billion under management, according to the website ETF.com.

There's been a "Cambrian explosion of new species" of index-related strategies, including ones that replicate various hedge fund strategies or that suppress volatility by moving more assets into cash when markets get rocky, Andrew Lo, a finance professor at MIT's Sloan School of Management, wrote in a 2015 paper called *What Is an Index?* Such products, he wrote, have "blurred the line between passive and active."

Edited by Pat Regnier

PETER FOLEY/BLOOMBERG

n’t beat rket

But people keep trying

The rise of index funds isn’t only changing the asset management business; it could also be having an effect on how public corporations are managed. Index fund managers have more incentive to push for improvements in corporate governance than an active investor does, because they generally don’t have the option to bail out of a stock when they don’t like the way executives are steering a company. Among other things, passive managers appear to prefer board members to be independent of management. “A 10 percent increase in ownership by passive investors is associated, on average, with a 9 percent increase in the share of directors on a firm’s board that are independent,” according to a 2014 paper by Todd Gormley, Donald Keim, and Ian Appel, all then at the University of Pennsylvania’s Wharton School.

Activism by fund managers isn’t necessarily a good thing—say, if the managers use their influence to suppress competition. Near the end of his life, Bogle expressed concern over academic research theorizing that consumers could be harmed by the rise of index funds and other kinds of funds that own big stakes in companies that compete with one another. One study appeared to find that airfares rose more on routes where the competing airlines had high levels of cross-ownership by funds.

Last year BlackRock Inc., the world’s biggest fund manager, which manages index funds as well as actively managed ones, warned in a filing that its “business operations, reputation or financial condition” could be adversely affected by policies to address possible harm from institutional investors’ common ownership. The Federal Trade Commission is taking the concept seriously enough that it held a daylong workshop on it at New York University Law School on Dec. 6.

One proposed remedy is to limit a fund to a maximum of 1 percent of the shares in competing companies. If it wanted to go above that threshold, it would have to own shares in just one company in the sector. That would spoil the business model of big index fund companies—and no doubt upset a lot of fund investors. (It’s also not clear what difference it would make, because company managers would still know that the underlying fund investors are diversified and own shares in competitors.) Yale Law School professor Fiona Scott Morton says she doesn’t expect any action soon but adds, “Someday we might have an administration that was pro-competition.”

The case against funds isn’t proven yet, though. Critics of the airline study say its results are hard to interpret, in part because of frequent airline ownership changes and bankruptcies. A study of the four companies that dominate the breakfast cereal market in the U.S. found that the companies behaved opposite from what the antitrust theory would have predicted, according to one of the authors, Christopher Conlon of New York University’s Stern School of Business. Answers Yale’s Morton: “We’re watching evidence accumulate. It’s a little bit slow.”

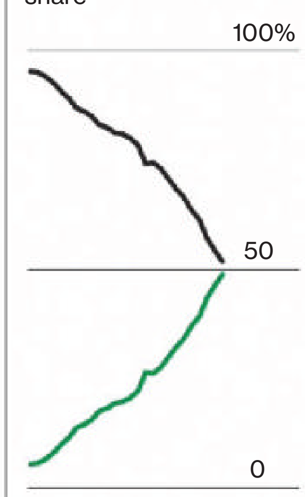
Such questions arise only because of the popularity of index investing. Bogle, who started the whole thing, was both proud and on the lookout for trouble. In an op-ed in the *Wall Street Journal* in November, he wrote, “The question we need to ask ourselves now is: What happens if it becomes too successful for its own good?” —*Peter Coy*

THE BOTTOM LINE The amount of money in U.S. stock index funds could soon surpass the amount in actively managed ones. But “passive” funds are being used for active management.

● Assets in U.S. equity funds

Actively managed share

Passively managed share



DATA: MORNINGSTAR DIRECT

● Bogle

A Thundering Herd Of Unicorns

● The public is about to get a chance to buy Silicon Valley's biggest names

The unicorns are coming: Hot private companies that have held off for years from going public, including Airbnb, Lyft, and Uber Technologies, are widely expected to hit the market in 2019. Assuming the U.S. government shutdown ends in time to prevent long regulatory delays, it should be a big year for new-stock sales. Goldman Sachs Group Inc. estimates the value of initial public offerings in the U.S. will reach $80 billion, double the yearly average since 1990.

This makes some market observers nervous. The increase in IPO activity adds a source of potential surprises and disappointments to an already volatile environment. And many founders see this as the right moment to sell stock, which could be a sign that shares are expensive. "Aggregate IPO activity has generally been elevated towards the end of the cycle as companies seek valuations at high multiples," Goldman strategists wrote in a note in November.

Take 2007, just before the financial crisis. About 290 new companies with a combined deal value of more than $60 billion listed on U.S. exchanges, data from Dealogic show. Both numbers were the highest since 2000. And leading up to the dot-com rout, IPO activity was elevated for years.

Part of the reason this year's estimate is so high is because some of the companies have been around a long time and are highly valued. It's not inconceivable that Uber will fetch $120 billion in total valuation, while bankers have told Lyft it could be valued at as much as $30 billion; Airbnb was last valued at about $31 billion. The last time three U.S. tech companies worth more than $10 billion each went public in the same year was 2000.

For Kathleen Smith, principal at Renaissance Capital, a provider of IPO-focused institutional research, there's a fair chance this year's take will exceed Goldman's estimate. Could that much issuance shock the market and cause volatility? "There's no doubt about it," she says.

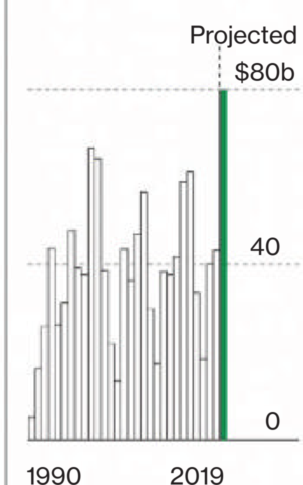
A few things augur poorly for the orderly absorption of new shares. One is the growth of passive investing and the decline of active managers, who were often enthusiastic buyers of new shares. (Index funds won't buy a stock until it's added to the benchmark.) Individual investors don't participate as much in IPOs as they did 20 years ago. "You have the extra issue of, 'Oh my gosh, look at all this supply,'" Smith says. "And we're in a much different market. Where's the demand?"

Others think it's unlikely IPOs will have much of an effect on the wider market. After all, even $80 billion is a tiny slice of a U.S. market worth almost $29 trillion. "It strikes me as sort of a ripple rather than a tidal wave," says David Ethridge, U.S. IPO services leader at PwC. And with economic output in the U.S. expected to increase 2.5 percent this year and earnings forecast to grow 6.7 percent, there's still reason for optimism for the IPOs.

Then there are the market convulsions of the past few months, which raise a question for giant private companies: Why'd you wait? "It amazes me that all these companies have stayed private so long," Smith says. "My mother would say, 'You need your head examined for not coming out in the market in 2017.'" —*Sarah Ponczek*

THE BOTTOM LINE A load of new shares is about to hit a jumpy U.S. market. It will be a test of whether Silicon Valley startups have waited too long to go public.

● IPO deal value of U.S. issuers



DATA: DEALOGIC, GOLDMAN SACHS

Colleges Cope With Scooter Startups

● Endowments are investing in the companies, while campus officials worry about safety

Colleges are nervous about the boom in shared electric scooters, which riders can rent with an app and then leave at their destination for the next rider. Administrators see students zipping down campus streets and sidewalks as a safety hazard. They worry about unused scooters littering the quad and people tripping over them.

Shortly after scooters owned by Santa Monica, Calif.-based Bird Rides Inc. began showing up at

Michigan State University, senior officials shared the news at a staff meeting that dozens had been impounded by campus police after being strewn around the school's 5,200 acres. Phil Zecher, chief investment officer of Michigan State's almost $3 billion endowment, piped up with some surprising news: The endowment invests in Bird as part of a venture capital fund, Upfront Ventures Fund VI. "As big entities and also as big investors, we sometimes invest in the same companies that are disrupting us," Zecher says.

MSU isn't the only investor with complicated feelings about scooters. San Francisco banned them, then set up a one-year pilot program allowing two companies to deploy a limited number of the devices in the city. Bird applied but didn't win the bid. Meanwhile, the city's employee retirement system has a stake in Bird via Upfront Ventures. So does the endowment for the University of Texas at Austin, where campus officials created a working group of eight departments including public safety, campus life, parking, and legal affairs to deal with scooter policy and enforcement. The school's parking department will impose $150 fines for improperly parked scooters. Bird is one of several companies whose scooters are showing up in cities and on campuses across the U.S., but it's among the biggest.

Investors who commit money to a venture capital fund generally don't get to pick where it invests, and these funds' investments in Bird are comparatively small. The Texas endowment is $31 billion, for example, and it committed $40 million to the Upfront fund, only some of which went to Bird. Still, small venture investments sometimes pay off big for institutional investors: Yale's original $2.7 million investment in LinkedIn Corp. produced $84.4 million in gains for the school's endowment after the company went public in 2011.

Bird says one of its missions is to reduce car usage and carbon emissions. And some see scooters as a good fit for campuses. "Colleges and universities are actively looking for new and different strategies to advance their sustainability goals with programs like scooters," says Meghan Fay Zahniser, executive director of the Association for the Advancement of Sustainability in Higher Education.

But universities and cities have suddenly found themselves having to deal with the arrival of hot new businesses that are changing how people use their streets and sidewalks. "Because it's such a competitive market and they are venture capital-funded, they are in a race to show market capture at whatever price," says Marcel Porras, chief sustainability officer for the Los Angeles Department of Transportation. Bird is one of seven companies that's allowed to provide scooters in L.A. as part of a pilot program. The city's employee pension fund is another investor in Upfront VI.

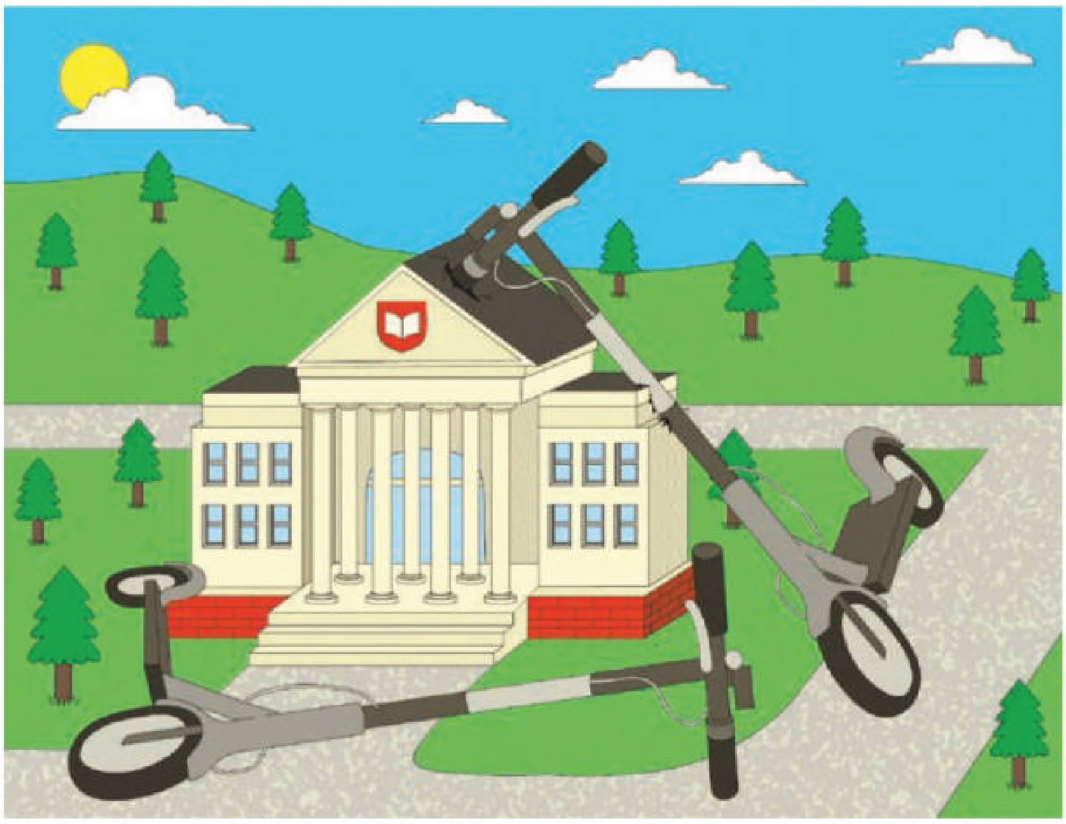


ILLUSTRATION BY PAUL WINDLE

The University of Georgia, which doesn't invest in the Upfront fund, says it's impounded more than 1,200 scooters—most of them Bird's, because of its larger presence in the area. "The university's primary concern is safety—safety for those riding scooters and for bystanders who might be hit by them or whose path might be impeded by an abandoned scooter," says Greg Trevor, a spokesman for the school. His office has circulated videos taken from campus buses of riders scooting in between the curb and the vehicles or darting in front of them. (Athens-Clarke County, where the college is located, recently put a temporary ban on shareable scooters.)

Captain Charles Bonnet, who oversees operations for the University of Texas at Austin's police department, says because scooters are a new technology, there can be confusion about where to ride them. Utimco, which invests money for the University of Texas and Texas A&M systems, declined to comment on its investments. The San Francisco Employees' Retirement System declined to comment.

Satish Udpa, Michigan State's acting president, says the school is trying to work with three scooter companies on campus to designate parking spots, share data, and get riders to comply with rules. Mark Suster, managing partner of Upfront Ventures, says he's confident Bird's scooters have a future in cities and on campuses. "Campuses are grappling with them because people actually want to use them," he says. —*Janet Lorin*

"We sometimes invest in the same companies that disrupt us"

THE BOTTOM LINE Scooter-sharing services funded by venture capital have popped up on campuses and in cities, and they're changing how people use sidewalks and streets.

How China Makes Its Numbers

● The integrity of the country's economic data is no longer just an academic concern

China's official economic data is sparse on details, opaque in methodology, and remarkably smooth—all of which feed suspicions that it's tweaked for political purposes. In the final quarter of 2018 it was also something else: about right.

According to China's National Bureau of Statistics, in the last three months of 2018 the economy expanded 6.4 percent from a year earlier. That's down from 6.5 percent in the previous quarter and the slowest pace since the nadir of the great financial crisis. But it's not a disaster: With growth for the year as a whole at 6.6 percent, Beijing can still claim success in hitting its 6.5 percent target.

The government-issued data were in line with estimates derived from proxy gauges developed by Bloomberg Economics—possibly a coincidence. It's certainly too soon to lay decades of suspicions about China's economic pronouncements to rest. Premier Li Keqiang once dismissed the numbers as "man-made." Major provinces—including Liaoning, where Li was once Communist Party secretary—have confessed to large-scale statistical fraud. The very speed with which the figures are compiled, merely three weeks to measure the performance of a $13.5 trillion economy, raises questions about their credibility.

More damning still: China's gross domestic product and other metrics scrutinized by investors are remarkably smooth, while those of other nations bounce around from quarter to quarter. On average, China's GDP growth rate has changed 0.2 percentage points each quarter since 2011, less than half the average for the U.S.

That's why economists trying to work out what's really going on rely on a range of proxy gauges.

Edited by Cristina Lindblad

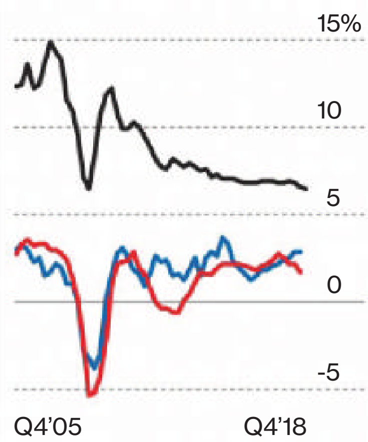
ILLUSTRATION BY 731

Numbers Game

❶ China's "smooth" GDP—apart from the global meltdown—has made its statistics suspect.

GDP, year-over-year change

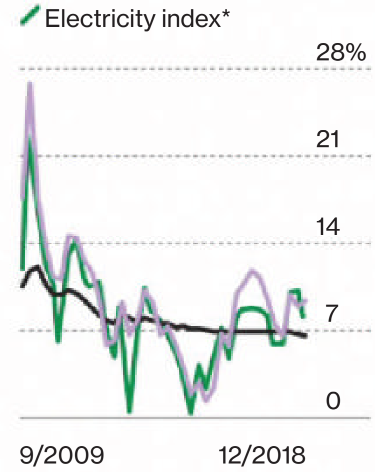
China U.S. EU



❷ Other measures of GDP show more volatility in growth than official data.

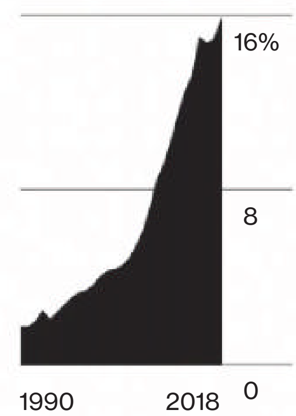
GDP, year-over-year change

Official Li Keqiang Index Electricity index*



❸ As its economic might increases, accuracy is much more important.

China's share of global GDP



*ELECTRICITY CONSUMPTION BY AGRICULTURE, MANUFACTURING, AND SERVICES, WEIGHTED BY SHARE OF GDP; DATA: NATIONAL BUREAU OF STATISTICS, BUREAU OF ECONOMIC ANALYSIS, EUROSTAT, BLOOMBERG ECONOMICS, IMF

Bloomberg Economics looks at three: a monthly GDP tracker based on a weighted average of activity indicators such as industrial output and retail sales; an electricity index that factors in power consumed by manufacturing, services, and agriculture, adjusted by each sector's share of GDP; and the Li Keqiang Index, which was inspired by the premier's suggestion that electricity, rail freight, and bank loans provide a more reliable guide to growth than official data.

These alternative barometers don't always line up with the official GDP data. In 2015, for example, Bloomberg Economics's numbers and those from a range of independent economists (producing China GDP proxies is something of a cottage industry), suggested growth may have fallen to 5 percent or below. For the latest quarter, though, the official and independent gauges more or less match.

To understand what's going on, it's necessary to take a short detour into the history of China's economic statistics. Going back to the Mao era, the main source of distortions in the data was a conflict of interest for local officials. Provincial chiefs were in charge of reporting on the performance of their local economies, and their prospects for advancement depended on how good those numbers looked to Beijing.

In 1998, as the Asian financial crisis hammered China's neighbors, the impact of that conflict was plain to see. Data on everything from energy consumption to air travel showed growth flatlining. Professor Thomas Rawski, an expert on China's economy at the University of Pittsburgh, estimated that China's economy expanded by 2.2 percent or less that year, while the official reading was 7.8 percent.

The disparity was so glaring that China's leadership had no choice but to act. Then-Premier Zhu Rongji spoke of a "wind of embellishment and falsification" sweeping through the statistical system. In the years that followed, far-reaching reforms attempted to strip the impact of local exaggeration out of the data. The National Bureau of Statistics in Beijing took on an expanded role, and conflicted local officials were squeezed out.

Those reforms didn't eliminate conflicts of interest at the top level. National leaders don't have to worry about promotion. But they do set a GDP target and face a blow to their credibility if they miss it. No one has a window into the internal workings of the National Bureau of Statistics. The remarkable consistency of the data, though, raises suspicions that the top-line numbers are being massaged to conform to government targets.

A plausible, but unverifiable, alternative narrative on China's growth over the past few years goes something like this: The slowdown in 2015 was sharper than reported. That's what the proxy indicators suggest. It's also consistent with the meltdown in China's equity market and panic over a surprise devaluation of the yuan. With government policy swinging aggressively to support growth, the rebound in 2016 and early 2017 was more pronounced than official statistics show. In 2018, President Donald Trump's trade war and President Xi Jinping's debt-reduction drive began taking a toll and the economy began to decelerate. This time the official and proxy gauges are telling a consistent story, or at least intersecting.

In 1998, China accounted for an inconsequential 3.3 percent of global output, and the quality of its data was of interest only to a few academics. In 2018 the country's share of worldwide production was almost 16 percent, meaning the integrity of its statistics are a subject of interest for everyone from the U.S. Federal Reserve trying to set monetary policy to Apple Inc. forecasting iPhone sales.

Looking forward, two factors give cause for optimism. First, China's leaders are on board: In a speech early in his six-year presidency, Xi said growth should be "genuine, with no added water" —code for exaggeration. Second, as China's financial system opens to global investment, credible data are an essential underpinning of confidence. With incentives aligned around accurate reporting, maybe the latest GDP release will be the beginning of a trend. —*Tom Orlik*

THE BOTTOM LINE Remarkably, China's latest GDP data align with those worked up by independent economists. It's too soon to conclude that the country is done massaging its numbers, though.

● Chinese growth for 2018, according to the National Bureau of Statistics:

6.6%

Feeling China's Pain

● Multinationals' reliance on the country's enormous consumer market could turn into a liability

China has long been a magnet for U.S. brands eager to tap its massive population. Even as the heady days of double-digit economic growth ended this decade, the consumer story rolled on as tens of millions were added to the coffee-sipping, moviegoing, smartphone-addicted middle class, a cohort that exceeds 400 million people.

Starbucks, Apple, and Walt Disney led the charge into China with Chai Frappuccinos, rose-gold-colored iPhones, and films with Chinese actors and locations woven into plotlines. So when Apple Inc. cut its revenue forecast for the first time in almost two decades on Jan. 3, citing weaker demand in China, a chill swept across corporate America. What if Donald Trump's trade war has done what Beijing's crackdown on corruption, pollution, and shadow banking, along with rising living costs and slowing wage growth, hasn't: shaken the confidence of China's consumer? "The good times are over," says Michael Every, head of Asia financial markets research at Rabobank in Hong Kong. "Growth will slow, and even if it doesn't, rising nationalism means U.S. stuff is no longer cool."

Spending by consumers has played an increasingly important role in propping up China's economy in recent years, as the traditional engines of growth—industrial production and real estate investment—have cooled. Policymakers have encouraged this rebalancing of the economy, supporting generous wage gains even if that eroded China's export competitiveness.

Cracks started to show in the consumer story in 2018 as surging home prices in Beijing, Shanghai, and other megacities began to pinch the upwardly mobile, in particular younger people saving for a deposit while renting. One warning that Chinese shoppers were losing their nerve came in November, when Alibaba Group Holding Ltd., operator of the Tmall online marketplace where many U.S. companies list their goods for sale, downgraded its revenue guidance by as much as 6 percent for the fiscal year ending in March 2019.

Estée Lauder Cos., which sells its perfumes and makeup on Tmall as well as in retail outlets in about 120 Chinese cities, relied on China for about 61 percent of its sales growth in the fiscal year ended June 2018, according to a recent report by Goldman Sachs Group Inc. analyst Jason English. That degree of China dependency would have been seen as positive months ago, but no longer. English recently changed his recommendation on the stock to sell, noting the possibility of a "significant deceleration" because of tougher conditions in China.

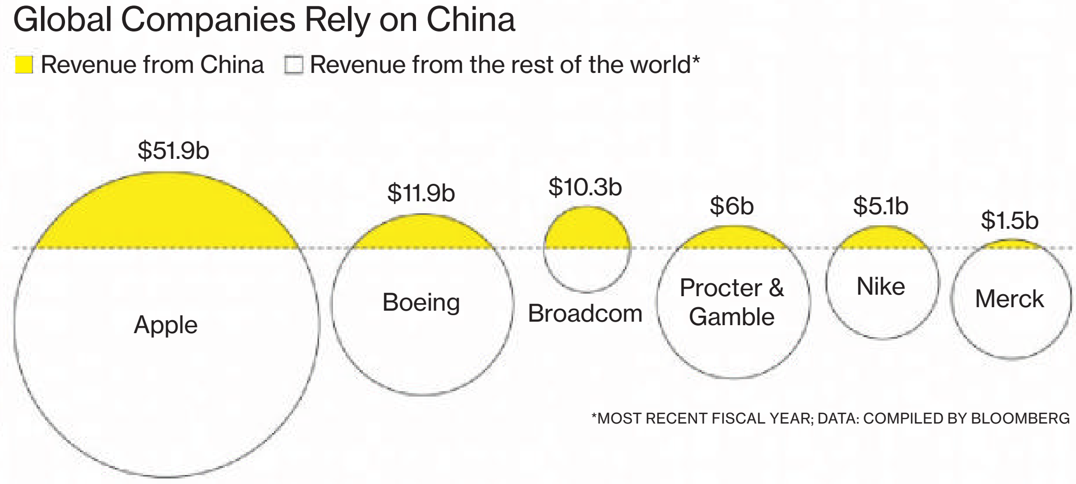
Estée Lauder is still expecting double-digit sales growth in China for its current fiscal year, "albeit at a moderated pace," according to a company statement, adding that it had introduced brands Darphin and Jo Malone London on Tmall. "We are committed to China and Chinese consumers for the long term and believe our growth is sustainable due to strong fundamentals," the company said.

Softening demand for discretionary items such as imported perfumes and skin treatments isn't the most worrying indicator that the Chinese consumer is retrenching. Vehicle sales fell in 2018—a first in 28 years—declining 4.1 percent, to 23.7 million units, according to the China Association of Automobile Manufacturers. American automakers were among the hardest hit. General Motors Co.'s China arm sold 3.6 million vehicles last year, down 10 percent from 2017.

The trade war is a major factor in falling auto sales, according to Bloomberg Intelligence analyst Steve Man. "It's denting consumer confidence. Even though a lot of the buyers probably have the money to buy a new vehicle, they're unwilling to actually open up the purse strings," he said during a Jan. 10 interview on Bloomberg Television.

Walt Disney Co., which is currently producing

Global Companies Rely on China



*MOST RECENT FISCAL YEAR; DATA: COMPILED BY BLOOMBERG a live-action remake of its 1998 animated classic, *Mulan*, set in China, has also been feeling the pressure. "What we're seeing in China is maybe a slight reduction in consumer confidence, and that's having an impact on the business somewhat," Walt Disney Chief Executive Officer Robert Iger told analysts in a November conference call. He also said the company remains bullish on the country.

Starbucks Corp., which expects to have 6,000 cafes in China in four years, up from approximately 3,600 now, said in December that annual same-store sales growth in the country could be as low as 1 percent over the long term, raising concerns about one of its most important markets. And the list goes on: Hyatt Hotels Corp. has been expanding aggressively in China, yet the hotel operator logged only 2.5 percent growth in Asia-Pacific revenue for the third quarter, down from 6.3 percent from the previous year.

Not every company sees a slowdown coming. Nike Inc.'s revenue from Greater China jumped 25 percent in the six months ended November, to $2.9 billion, equal to 15 percent of Nike's total sales, according to a company filing. "We continue to see very strong signs of momentum in China," Chief Financial Officer Andy Campion said on a December call with analysts. Johnson & Johnson's business in China grew about 16 percent in the third quarter, CFO Joseph Wolk said at a conference in January. "We're in pretty good shape in terms of China as it stands today," he said.

Although pricey iPhones are not the ideal instrument for taking the temperature of the world's No. 2 economy, Apple's warning and Trump's trade war may make executive suites rethink whether there's such a thing as too much China exposure. "We could be in a more choppy period," says Jeffrey Towson, a professor of investment at Guanghua School of Management at Peking University. —*Bruce Einhorn, Xiaoqing Pi, and Enda Curran, with Kim Bhasin*

THE BOTTOM LINE After years of building their presence in China, U.S. brands—Estée Lauder, GM, and Disney among them—are bracing for a slowdown in consumer spending.

In Wenzhou, It's Adapt or Die

● A hub for private businesses is a crucible for Beijing's plans to upgrade the economy

Zhu Jun says he broke down in tears when a city court seized his dream car. His shoemaking business, Wenzhou Yi He Footwear Ltd., had collapsed two months earlier as stretched customers delayed payments and Zhu was unable to take out any new loans. His Audi Q7 was repossessed and sold to pay the company's workers. "It's too cruel for private companies," says Zhu in an interview at the Wenzhou International Shoe Mall, a five-story wholesale market. "The payment issues were never so severe in the four years my company existed."

Wenzhou, a port city of 9 million on China's eastern coast that minted many a billionaire during the country's ascent to global manufacturing powerhouse, has an air of crisis these days. Industries that once formed the backbone of the local economy, like apparel and footwear manufacturing, are somewhat insulated from the effects of the U.S.-China trade war since low-wage competition from locales like Vietnam has already forced many to pivot away from exports and toward the local market. Yet they're not immune to the drag President Donald Trump's tariffs are exerting on consumption and investment in China. The government's crackdowns on shadow financing–a response to a wave of defaults and investment scams that triggered protests in several cities–make it harder for them to raise money. And more stringent pollution controls have added to their cost of doing business.

On Jan. 20, China's National Bureau of Statistics released data pegging economic growth for 2018 at 6.6 percent, the lowest annual rate in 28 years. To counter previous slowdowns, policymakers primed the economy with borrowed money. This time, they've stuck to targeted stimulus measures, a process that creates losers as well as winners. The change of approach is being driven largely by China's debt load, which at two-and-a-half times gross domestic product makes funding a splurge on bridges and railways dangerous for financial stability.

"In a few years, I expect the Chinese economy to look quite different"

Wenzhou had already been feeling the pressure of the government's yearslong effort to shift the economy away from basic manufacturing toward services and high-tech industries. (Services' contribution to the economy rose to about 52 percent in 2018, from 44 percent in 2009.) "Many companies are failing, and surging costs have put a heavy drag on business," says Tao Dong, vice chairman for Greater China at Credit Suisse Private Banking ▶

◀ in Hong Kong. "But this also forces a transition. In a few years, I expect the Chinese economy to look quite different."

The shoe mall was almost deserted on a recent January morning, despite it being the peak buying season. Outside the yellow-walled building, empty stores dot the potholed, muddy streets in the western part of the city. Sen Nan Shoe Materials Ltd., which manufactures shoe soles, will soon close its shop to save 200,000 yuan ($29,400) a year in rent, according to sales manager Li Xiang. It now gets only one or two customer visits a day, so there's no point keeping it open, she says.

Businesses that have defied the downturn tend to be the ones that have shifted to higher-value products. Midpoint Group, a onetime manufacturer of toilets and electrical switches, has transformed itself into a maker of more sophisticated devices such as voice-controlled lighting and blood-pressure monitors by channeling 5 percent of annual revenue into research and development. The company saw profit rise 10 percent last year on revenue of 200 million yuan, according to Chairman Zhu Chenghua. This year it plans to launch a camera-based system to monitor the elderly in their homes.

Economists see the pace of China's economic expansion slowing to 6.2 percent this year and 6 percent in 2020. Still, it's not clear whether President Xi Jinping can pare down the nation's debt levels and modernize the economy without triggering a deeper slump. "Chinese officials face a delicate calibration challenge," says Frederic Neumann, co-head of Asian economics research at HSBC Holdings Plc in Hong Kong. "It requires considerable finesse, delivering targeted support to industries moving up the value chain but also keeping sufficiently tight reins overall to encourage resource allocation away from sectors that no longer offer the desired returns."

▲ Rising wages, along with a crackdown on shadow lending and pollution, threaten the survival of some of Wenzhou's private-sector businesses

QILAI SHEN/BLOOMBERG

Such worries were eased a little recently when credit growth data for December came in above expectations. Investors were also encouraged by policymakers' vows to enact deeper tax cuts. "Fiscal policy will be the front line of defense against mounting macroeconomic headwinds in 2019," wrote Haibin Zhu, JPMorgan Chase & Co.'s chief China economist, in a recent note to clients.

A key part of the challenge is to restore the confidence of private-sector businesses that contribute 60 percent of GDP, 80 percent of employment, and 90 percent of new jobs. Many of those companies have been hit by the crackdowns on nonbank financing and pollution. Big, state-owned enterprises have easier access to loans from government-run banks and more money available to meet stricter environmental standards.

A Wenzhou-based online lending platform, whose managers asked that the company not be named, is one of the victims of the government's

▲ A worker puts the finishing touches on a batch of women's sneakers

drive to limit shadow financing. The peer-to-peer site received a government notice in November to halt new operations and clear outstanding loans, according to a company manager. Now it may have to close.

To counter complaints from small businesses that they cannot access credit, Xi proclaimed "unwavering" support in October and embarked on an unprecedented push to cajole banks into lending more to small companies. A blizzard of policies to help ease costs followed, including a reduction in mandated social security contributions. Earlier this month, the State Council, China's top administrative authority, announced a $29 billion annual tax reduction plan for small companies.

While managers at Midpoint say the company has benefited from some government measures, many businesses in Wenzhou say they've yet to see any positive impact. Hu Sheng, owner of Xia Bai He Women's Shoes Ltd., says he pays more taxes, not less, since he was forced to move to an expensive industrial park because the building that used to house his workshop was demolished. He's cutting back production because of weak domestic demand and says he's considering relocating the business to his home town of Huanggang in central China's Hubei province, where labor and rent are cheaper.

"Private enterprises are facing more challenges and pressure due to the deteriorating economic slowdown from an already difficult situation," says Zhou Dewen, Deputy Director of the China Association of Small and Medium Enterprises. "China needs to live through bitter days for several years as it restructures its economy, but eventually it can have a bright future." —*Bloomberg News*

THE BOTTOM LINE The private sector generates 60 percent of China's GDP, but for those in basic manufacturing, Beijing's recent support for small enterprises may be too little, too late.

● In January, Beijing announced tax breaks for small companies totaling

$29b

How Merkel Lost Her Grip

● An insider look at how the German leader's dominance came to an end

Angela Merkel didn't flinch, and the brickbats kept coming. At a private meeting with her party's lawmakers on June 12, 2018, speaker after speaker got up to attack her refugee policy and endorse the enemy within her coalition government, Interior Minister Horst Seehofer, a hardliner on immigration. The chancellor's advisers had never seen her suffer such sustained fire from her own troops. "What's the strategy?" one Merkel aide asked a colleague in an SMS from the sidelines of the meeting in Berlin's Reichstag. "I don't know," replied his colleague. "I don't think we have one."

After 13 years in power, Merkel had run out of ideas for keeping the Christian Democratic Union (CDU) in line. She barely said a word throughout the meeting, and when it ended, no one knew what would happen next. The following week would see Merkel and Seehofer battle until she promised to muster support for her refugee policy from the rest of Europe at an upcoming summit. Seehofer desisted—for a while.

Merkel became Europe's preeminent leader with a reputation as an arch-pragmatist and master of the art of compromise—which included persuading her conservative party to move to the center and hammering out a bailout deal with the Greek government during late-night summit crises in 2015. But the June meeting marked the end of the imperial phase of her chancellorship. The breakdown in party discipline would be compounded by CDU setbacks in state-level elections in Hesse and Bavaria in October. And just six months after the contentious closed-door meeting, Merkel sat on the sidelines as her successor as party chief, Annegret Kramp-Karrenbauer, set out her plans at Konrad-Adenauer-Haus, the CDU's Berlin headquarters.

It was some consolation that Kramp-Karrenbauer, a Merkel protégée, had held off a conservative backlash during a December leadership contest to take over as CDU boss. That will give Merkel a degree of stability as she serves out her chancellorship, which ends in September 2021. It could still allow her to stand up to Donald Trump's challenge to the global order or even engineer one last European intervention to resolve Brexit. But the transition to the post-Merkel era has started. Kramp-Karrenbauer will try to heal the rift with the party's more conservative supporters by returning to its roots on immigration and the family, while preserving Merkel's legacy. At this year's World Economic Forum in Davos, which began on Jan. 22, investors and foreign leaders are looking to Kramp-Karrenbauer for clues to what Germany's future will look like once Merkel is gone.

How did the chancellor lose her dominant position in Germany, the European Union's economic center of gravity? The public controversy over her pro-refugee stance is well-known. But details of her personal intransigence on the issue—one that made it politically impossible for her to continue to lead

Edited by Jillian Goodman and Ben Holland

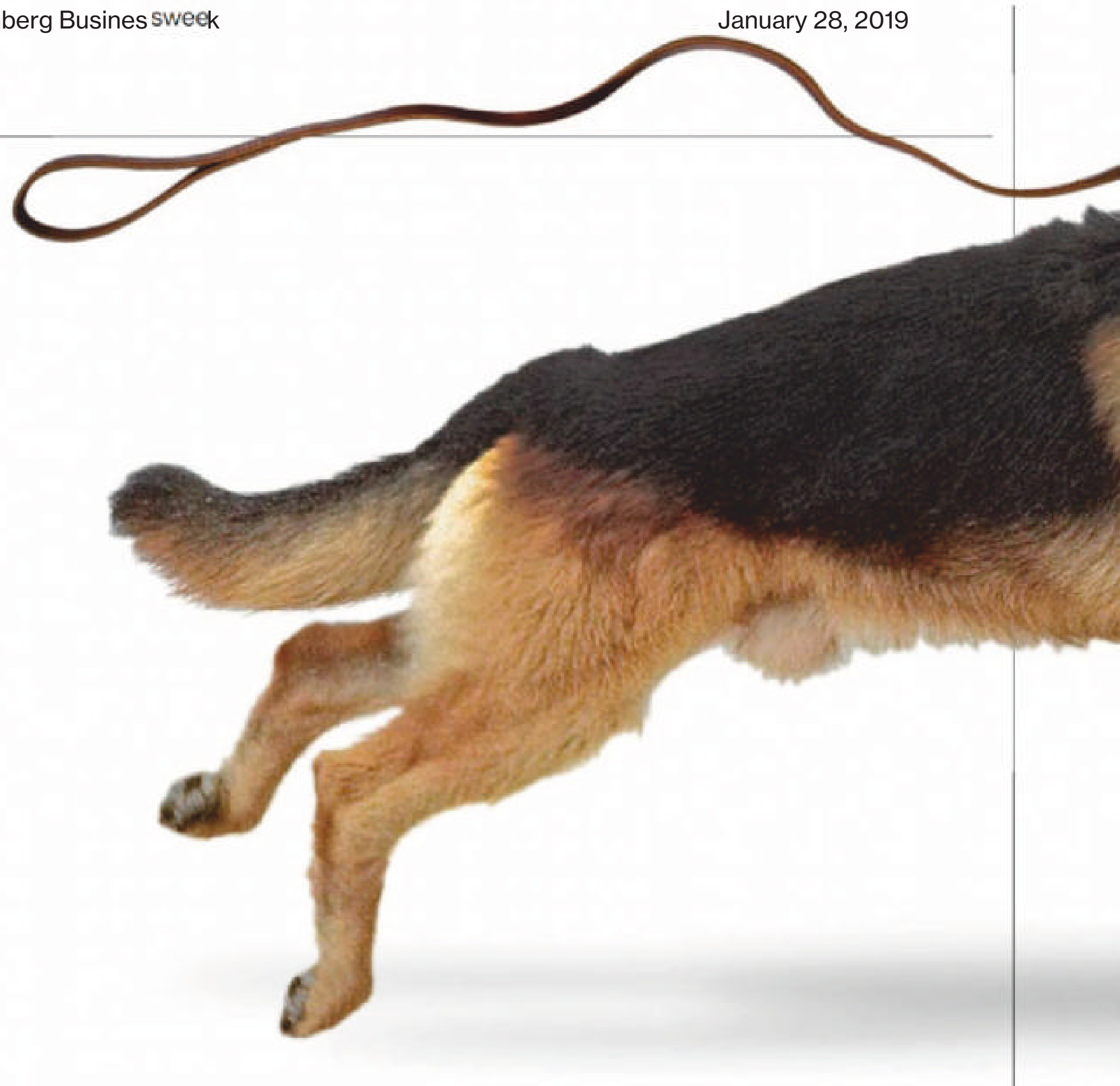


PHOTO ILLUSTRATION BY 731; PHOTOS: BLOOMBERG (1); GETTY IMAGES (2)

the party—emerge from interviews with officials with knowledge of the events who asked not to be named discussing private matters. The chancellor's office offered no comment.

Merkel began 2018 facing questions about her political acumen. Her party saw the worst national election result in its history in September 2017, losing 64 seats in the Bundestag. It would take her six months to stitch together her fourth coalition. Critics within the CDU, such as Friedrich Merz, who led last year's challenge to her legacy, complained that she had no ideological convictions, no grand vision.

But she did have one big cause, which she'd embraced at the height of her powers in 2015: immigration. If the European debt crisis sealed Merkel's position as Europe's ultimate arbitrator, the flood of refugees that followed revealed the moral compass of the Lutheran pastor's daughter. It came at considerable political cost.

As the civil war in Syria deepened, millions of refugees abandoned the devastated country and headed west to seek asylum, trudging through the Balkans toward western Europe and triggering waves of alarm that still echo throughout the EU. By September 2015 governments in the east were erecting internal border barriers within the bloc for the first time in a generation, and thousands of Syrians were stuck at a Hungarian rail station. Merkel decided to let them in. In the months that followed, more than a million people arrived. "If we now have to start apologizing for showing a friendly face in response to an emergency situation, then that's not my country," she said that month as the anti-refugee protests mounted.

Looking back, Merkel's aides say her sensitivity to European and German history meant her decision was as much emotional as rational. Having grown up under communism, she's always had a special appreciation of how much Germany and Europe gained when the Berlin Wall came down. One aide said the scenes in 2015 reminded her of a moment in the summer of 1989 when East Germans crossed the Iron Curtain to make their way to the West. Another emphasized how moved Merkel was by the courage of those seeking safety and a new life for their families.

But it was also the first time any chancellor has been so openly at odds with the popular opinion of the country and the ruling party. That split would never heal. Merkel shut herself away from the political attacks, refusing to listen to critics. For advice she relied almost exclusively on her closest allies, Chief of Staff Beate Baumann and media adviser Eva Christiansen. Both supported her refugee policy. "They were in a state of ecstasy," says one party official who pleaded with the chancellor to take a more pragmatic approach. "You couldn't talk rationally to them anymore." The only response to his warnings was an email from Merkel's team: "A chancellor does not correct herself."

It echoed Margaret Thatcher's steely quote, "The lady's not for turning." However, the disastrous September 2017 election results began to force a correction on her and her party. To form her government, she turned to Seehofer, the leader of the CDU's sister party from Bavaria on the ▶

"What's the strategy?" "I don't know, I don't think we have one"

◀ country's southern border. He'd been one of the harshest critics of Merkel's immigration policy, and in the coalition horse trading he snagged the post of interior minister. Although the flow of refugees had slowed, he had a point to make and proposed that Germany start to turn away people at the border. It was a policy Merkel could never accept.

CDU and Christian Social Union officials negotiated while rumors raced through Berlin that the parties' 70-year-old alliance could rupture, ending the newly formed coalition. CSU parliamentarian Georg Nuesslein stormed out of one meeting in the Bundestag. "Merkel doesn't care about the German people," he shouted at reporters. "Merkel doesn't care about the lawmakers. And you still believe that she is the last model European."

Seehofer was back on the offensive last September, when Merkel tried to fire her domestic intelligence chief. Hans-Georg Maassen had questioned the authenticity of a video of far-right protesters apparently lashing out at foreigners. But Maassen's office came under Seehofer's interior ministry—and Seehofer refused to comply with Merkel's decision. The two enemies met at the chancellery in Berlin to settle the issue. After a four-hour session, Merkel's office announced that Maassen wouldn't be fired but would get a new post under Seehofer. One CDU official, who asked not to be named, called it the absolute low point: Merkel couldn't fire her intelligence chief. Five weeks later, at the end of October, she announced she'd step down as party leader.

While she remains head of government, Merkel is already taking a back seat in politics. She wasn't the first speaker at the Dec. 17 CDU meeting that marked Kramp-Karrenbauer's debut as party leader. Merkel had to follow Secretary General Paul Ziemiak, who offered a report on efforts to keep the Merz bloc on board after their defeat in the leadership contest. The chancellor then got to brief the others on a recent EU summit. Merkel used to dash off after party conferences. At the December event she hung around instead to pose for photos with party employees. They wanted a goodbye picture with their former boss. —*Arne Delfs and Ben Sills*

THE BOTTOM LINE Merkel's firm stance on welcoming refugees ultimately cost her the leadership of her party and set an end date for her chancellorship.

An Economic Storm Gathers Over the Middle East

● Leaders can no longer use oil wealth to placate their struggling citizens

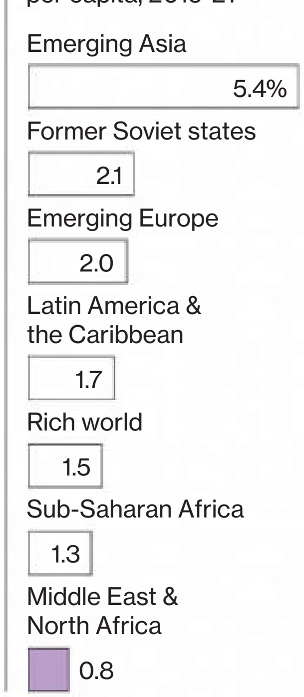
Saudi ministers had just finished presenting an upbeat view of the kingdom's economic prospects for 2019 at a December conference in Riyadh when a businessman sitting in the audience burst their bubble. After congratulating the officials on their growth predictions, Abdulaziz Al-Ajlan, a textile manufacturer, politely pointed out how little their outlook resembles reality. "Many small and medium-sized companies are shutting down," he said. "We see companies firing Saudis."

Four years of low crude oil prices have taken a toll on the Arab world's biggest economy and other oil exporters, exacerbating a malaise that's gripped the region since 2011. That year the Arab Spring protests swept across the Middle East, toppling regimes and wrecking economies. The oil-rich nations of the Persian Gulf mostly escaped the worst of it, but they weren't going to take any chances and spent heavily to ward off unrest. Now, after four years of lower crude oil prices, they're in financial trouble, too. The International Monetary Fund ranks the Middle East and North Africa as the worst-performing corner of the world economy since 2011, along with Latin America. Over the next few years, the IMF forecasts, the region will hold that title on its own.

Whether their countries are rich or poor, the area's rulers face similar problems, from high youth unemployment to growing dependence on debt to bloated government wage bills. They're finding long-term fixes hard to apply, as each painful step toward reform risks triggering discontent. Regional leaders can see the worst-case scenario unfolding in Syria, Libya, and Yemen, where instability eventually led to civil war. Tackling these economic challenges is "politically costly," says Alia Moubayed, a managing director for Mideast investments at Jefferies International in London. Moreover, Arab governments, especially those in the Gulf, lack trained bureaucrats who can carry out technical reforms, she says.

To overcome that problem, many of them are seeking foreign help. In poorer countries, that often means the IMF, which has been busy in the

● Forecast annual increase in GDP per capita, 2019-21*



*GDP AT PURCHASING POWER PARITY IN CONSTANT U.S. DOLLARS. DATA: IMF WORLD ECONOMIC OUTLOOK region since the Arab Spring. It's lent money to Egypt, Iraq, Jordan, Morocco, and Tunisia—and gets blamed, unfairly according to its officials, for the austerity imposed under the credit programs.

Tens of thousands of Tunisian public servants went on strike in January to demand higher wages and protest spending cuts. Their powerful labor union accused the government of committing the ultimate sin: being even "more receptive" to the IMF agenda than Tunisia's Zine El Abedine Ben Ali, the first dictator toppled by Arab Spring crowds. Prime Minister Youssef Chahed told protesters that raising their wages would simply require the country to borrow more.

Samir Radwan understands what it's like to feel that kind of political heat. A labor economist, he was Egypt's first finance minister after the uprising spread to his country in 2011. Because their populations are young and demand that change happen quickly, Arab rulers "don't have the luxury of time," he says. "I'd walk in the street, and people would tell me, 'If we can't get everything now, we'll never get it later!' There was no trust."

Radwan held on to his job for less than a year. He reached a provisional $3.2 billion loan accord with the IMF, but the Egyptian army vetoed it, unwilling to add so much to the national debt. Five chaotic years later, with the presidency again in the hands of a military man, Egypt faced a crippling dollar shortage—and ended up borrowing $12 billion from the IMF. It had to stop propping up its currency as part of the agreement, triggering a slump in the Egyptian pound and a spike in inflation to higher than 30 percent.

In Saudi Arabia there's enough oil money to make IMF loans unnecessary. Still, foreign consultants were brought in to draft blueprints for economic change, and they've faced the same kind of criticism for dashing off one-size-fits-all prescriptions. While demonstrations are banned, Saudi rulers remain alert to the threat of a public backlash, especially after the Jamal Khashoggi crisis. The Saudi columnist and critic was murdered by government agents, outraging the kingdom's allies and spreading doubts about the job security of its de facto leader, Crown Prince Mohammed Bin Salman.

The crown prince, the architect of reform proposals intended to wean the economy off its dependence on oil revenue and state welfare, defended their ambitious scale in an interview with Bloomberg on Oct. 3. "If you aim low, that means it's an easy target," he said. "That means no one will try to work hard to achieve it." And yet, after he enacted new taxes and subsidy cuts at the start of 2018, all it took was some grumbling

▲ Striking public officials demand a wage increase in Tunisia on Jan. 17

NACER TALEL/ANADOLU AGENCY/GETTY IMAGES

on social media for his government to revert to its old ways, pledging billions of dollars in handouts to offset the belt-tightening.

Some economists say reforms such as the prince's should've been made long ago. An IMF study found that countries do better at reducing oil dependence if they make the attempt while energy revenue is high, endorsing the maxim that it's best to fix the roof when the sun is shining.

In the current stormy climate, countries with fragile public finances have looked especially exposed. Bahrain, the only Gulf country to see large-scale protests in 2011, came to the brink of a debt crisis last year and had to turn to the Saudis, who orchestrated a $10 billion bailout. The war in Syria has devastated the neighboring economies of Jordan and Lebanon, two of the most indebted Arab countries, which have taken in millions of refugees.

Except for war, many of these challenges are shared by Latin America, the only region doing as badly as the Middle East. But there's one crucial difference. In most Latin countries, when the public isn't happy with the economy, they can elect a new government to run it differently. That's happened in the region's three biggest economies in recent years, with sharp political shifts from the left to the right in Brazil and Argentina and in the opposite direction in Mexico.

Meaningful elections are rare in an Arab world largely ruled by absolute monarchs and military strongmen. Protests, sometimes violent, have been the main avenue for people to seek change. There are few signs so far that Middle Eastern leaders have managed to deliver it. "It's not just about economics," says Radwan, the former Egyptian minister. "It's addressing expectations, addressing fears." *—Alaa Shahine, with Jihen Laghmari*

THE BOTTOM LINE Low oil prices have created an economic downturn in the Middle East that the region's leaders are ill-equipped to reverse.

Small Business

Rebooting the Communist Sneaker

A Berlin entrepreneur has revived Zeha, East Germany's answer to Adidas, Puma, and Nike

A dozen years after the fall of the Berlin Wall, Alexander Barré noticed a friend sporting shoes he recognized from his childhood in the former East. They were quirky and old-fashioned—and seemed ripe for revival as a brand aimed at urban hipsters. With no experience in the shoe business, Barré sought the advice of an 80-year-old cobbler who'd worked with Puma SE and Adidas AG. "If you had any idea what you're getting yourself into," the man told him, "there's no way you'd do this."

Barré pressed on with the blend of naive passion and raw excitement all entrepreneurs exhibit when faced with finger-wagging parents, partners, friends, and industry veterans such as the cobbler. Many—even most—end up in financial ruin. Some live to tell the tale of building a business, though typically after countless setbacks. Barré grappled with suppliers who failed to supply, materials of dubious origins, fickle business partners, overexpansion of the store network, and even a burglary at a shop. "We were absolutely clueless," he says. "For 10 years, every time I opened my mouth I swallowed water, because we were drowning."

Today, Barré's Zeha Berlin Schuh Design GmbH sells not only sneakers but also dress shoes, socks, bags, and wallets made from scrap leather. Last year, Zeha generated revenue of roughly €3 million ($3.4 million), employed about 20 people, and had a healthy online business that makes up some 40 percent of sales. He's got a pop-up store in London; is planning to push into Italy, Scandinavia, and possibly Australia; and is working on cycling shoes in collaboration with the organizers of a vintage bike tour.

In East Germany, Zeha was pretty much the only sports shoe available, as the likes of Adidas, Puma, and Nike came from the other side of the Iron Curtain. The company traces its roots to 1897, when a young cobbler named Carl Häßner started making sturdy leather shoes he called Zeha—a riff on the German pronunciation of his initials. After World War II, Zeha's factory in the small eastern town of Hohenleuben was partly nationalized and began to specialize in athletic shoes for schools, soccer clubs, and even Olympic hopefuls in places as far-flung as Canada, Cuba, and

ILLUSTRATION BY MOLLY DYSON. BARRÉ: ALEX KRAUS/BLOOMBERG

January 28, 2019

Edited by
Dimitra Kessenides
and David Rocks

CEO Barré outside a Zeha store in Berlin

Iceland (which paid in herring). In the 1950s the company changed its logo—four parallel stripes—into two angled double lines when Adidas complained it was too similar to its three-stripe pattern. The state took full control of Zeha in 1972, forcing out the four owners as the Communist Party consolidated its grip on the economy.

After the collapse of communism, East Germans, long deprived of Western wares, had scant interest in owning a pair of Zehas. Demand imploded, the factory closed, and the remaining shoes found their way to vintage shops, flea markets, or the dumpster. But by 2002, when Barré saw his friend wearing a pair, the timing seemed right to bring Zeha back from the grave. Adidas and Puma had successfully reissued classic designs, and Puma had a line of made-in-Italy designer shoes that pushed the boundaries of what's considered a sneaker. "People love brands with a history," says Barré, clad in blue and white Zehas and worker jeans.

He discovered that no one had claimed the Zeha name, so he was able to buy the rights for a few hundred euros in administrative fees. He trekked to the derelict factory, interviewed former employees, and dug up old designs. For the first model he settled on a handball shoe with a distinctive rubber toecap and clean lines he thought would work for streetwear. A breakthrough came in 2006 when Germany hosted the soccer World Cup, and Zeha produced a sneaker that looks like a cross between a bowling shoe and a sturdy old-fashioned soccer boot. Called the Carl Häßner, it's become the company's best-seller, retailing for €229 a pair.

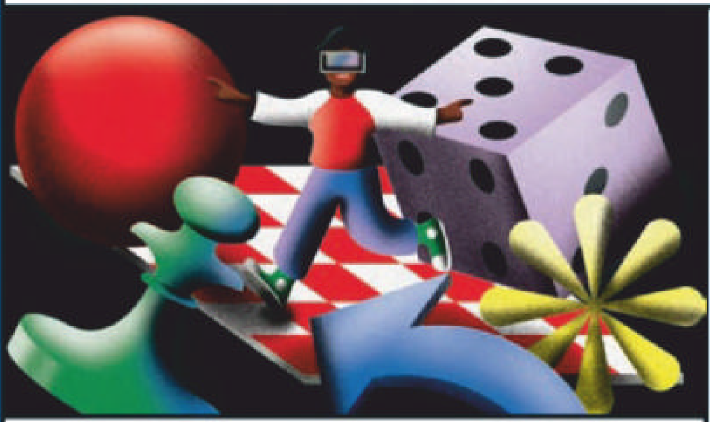
Although Barré sought to benefit from nostalgia for the brand and a guarantee of German craftsmanship, assembling the shoe in Germany proved impossible because the test models didn't meet his quality standards. "The soles would literally fall off," he recalls. "If you go to market with that kind of shoe, you're toast." After unsatisfactory attempts at production in Italy and Slovakia, Barré finally settled on Portugal, where Zeha has been making its shoes since 2010.

Barré, one of three owners, says he's been approached by people eager to invest, which might let him escape the daily grind of running a small business. But he says he wants to keep growing on his own steam rather than selling to someone who might be too ambitious. "There's interest, particularly from the U.S.," Barré says. "But I've seen new owners push, push, push, and then the brand overstretches and fails."
—*Benedikt Kammel*

THE BOTTOM LINE After more than a decade of setbacks, Zeha is growing, with €3 million in sales of its retro sneakers, dress shoes, and hipster accessories last year.

They've Got Testing Down to a Science

One startup's tips for running successful pilot programs



● NAME
A nod to the discovery that toxins in venomous marine snails could be used to make opiate alternatives for severe chronic pain

● EMPLOYEES
Four full-time

● FUNDING
$1.1 million in National Science Foundation grants; roughly $45,000 from crowdfunding campaigns

● REVENUE
About $150,000 since it started selling its games in 2016

Killer Snails makes educational games designed to spark interest in science among K-12 students. The startup was founded in 2015 by Mandë Holford, Jessica Ochoa Hendrix, and Lindsay Portnoy, who among them have decades of scientific research and teaching experience. From the outset, the partners knew the "play-break-fix" model would be key to building and expanding their business, says Chief Executive Officer Ochoa Hendrix. Killer Snails invests hundreds of hours in gathering feedback—over the past three years, roughly 10,000 students have tested its products. In January the company embarked on its first national pilot program for BioDive, a game that uses an online journal and virtual-reality immersions to simulate the experience of marine biologists on underwater missions.

"We're trying to figure out how we build content that is both a compelling story and scientifically accurate," says Holford, an associate chemistry professor at the City University of New York's Hunter College. Piloting is key for "developing games that make students feel like scientists addressing real-world problems." —*Nick Leiber*

Five Lessons

❶ Identify Intended Users	Determine which age group your product is for and where it will be used, such as at home or in the classroom, says Ochoa Hendrix. For Biome Builder, a tabletop game aimed at families, the team did prototyping at New York cultural institutions popular with parents, including the American Museum of Natural History and the New York Hall of Science.
❷ Start Local	In early trial runs, Killer Snails teamed up with schools and other entities near its Brooklyn location so the founders themselves could participate. They reach out directly to teachers as a first step. The team looks for educators with a range of experience, from 20-year veterans to newbies.
❸ Do Your Homework	The Killer Snails team coordinates visits with teachers, making sure to ask ahead of time about the number of students who will participate, the length of the class, the classroom setup, and any special considerations. For the BioDive national piloting, the startup provides teachers with a 15-page booklet of instructions, learning objectives, and potential discussion questions.
❹ Don't Waste Time or Money	Affordability and usability are crucial, says Ochoa Hendrix. Killer Snails pays for and provides teachers with inexpensive cardboard kits for VR viewing on smartphones. "The cost is zero for the school to pilot," says Ochoa Hendrix. "It's just the time commitment."
❺ Use the Feedback	In addition to the team's notes, students complete surveys after testing a game and answer questions meant to gauge their interest in science. "There's never been a time where we've been like, 'This is flawless, got it, nailed it,'" Ochoa Hendrix says. "Every time we pilot, we make changes."
Next Steps	Killer Snails expects to start licensing BioDive to schools this summer. To build a sales team, it will seek more money, including from the National Science Foundation's seed funding program.

ILLUSTRATION BY MOLLY DYSON

The Cider Whose Sales Spike When Stephen Curry Wins

Golden State Cider's success has a secret ingredient: the Golden State Warriors. While the only thing the drink and the basketball team have in common is their name, Golden State Cider has seen its fortunes rise with those of the reigning NBA champs, says the company's chief executive officer, Chris Lacey. "When the Warriors are in the finals, a lot of people purchase GSC in stores, and many bars offer GSC specials as well," he says. Lacey hasn't met Warriors All-Star Stephen Curry, and doesn't know if he drinks the cider, although the product is on the menu at International Smoke, the Bay Area restaurant co-owned by Curry's wife, Ayesha. "We're one degree of separation and a couple million dollars in sponsorship away from him," says Lacey. ——*Kate Krader*

1976

Devoto Orchards is founded in Sebastopol in Sonoma County, selling apples at farmers markets and to Bay Area restaurants.

2005

Selling apples becomes a challenging business model. Pinot noir vineyards begin replacing orchards in Sebastopol, and Sonoma County real estate prices hit an all-time high: The median home price is $619,000.

2010

Curry finishes his first season with the Warriors; future Golden State Cider founders Hunter Wade and Jolie Devoto travel to Italy and Spain to study wine- and cider-making.

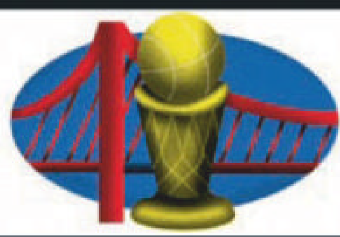
2012

Alongside its apples, Devoto Orchards begins selling 750-milliliter bottles of heirloom cider at Bay Area farmers markets.

2014

Devoto Orchards introduces the Golden State Cider brand with a portfolio of four core ciders, including the flagship Mighty Dry, which accounts for half its sales. For a new name, says Devoto, "we thought Sonoma County, maybe San Francisco, and then said, 'Why not the whole Golden State?'"

2015, 2017, 2018



The Warriors win the NBA Finals, and GSC reaches $1 million in sales in 2015, according to Lacey.

2018

GSC outsells beers and ciders at all 43 Whole Foods Northern California stores. Golden State forecasts an increase in production from 2018's 20,000 barrels to more than 30,000 in 2019.

2019

In April, GSC will move into a 30,000-square-foot facility in nearby Healdsburg, and in May, Golden State Cider Taproom will open in Sebastopol on the site of an old apple mill. "Just in time for the playoffs," says Lacey.

Grant Reid

President and CEO, Mars Inc.

"My job is to make sure that I'm setting us up for the next 100 years"

The family-owned company, based in Virginia, does more than \$35 billion a year in revenue and has expanded beyond candy to become a powerhouse in the pet space. In a rare interview, Reid speaks with *Bloomberg Businessweek* Editor Joel Weber.

Photograph by Ike Edeani

I have to ask, you're in the candy aisle and can get one thing. What do you pick?

Galaxy chocolate. I thought you might ask me that.

So Milky Way or Snickers?

Snickers.

Skittles or Starburst?

Skittles.

M&M's or Twix?

That's a tough one. What time of day is it?

Let's say 6 p.m.?

I'm going to go with M&M's.

If you did pick Twix, left Twix or right Twix?

I'm left-handed. So left-handed, too.

Now that we've got those out of the way, you worked at Mars for years before taking over as CEO in 2014. What initially drew you to the company?

I grew up in Scotland, so I was very familiar with the confectionery brands—Galaxy, Mars bars. Great brands that I grew up with and I loved. But it's much more than just the brands. It's really about the way it runs. It was the structure, what they do and how they do it, that was a big attraction. I've been there 30 years, so I guess I made a good choice.

Mars today is much more than candy. What's your vision for the company?

We've been in business for 107 years. If you're really going to keep relevant for the next 100 years, you've got to be growing. So part of the vision is we want to be in the categories that are growing in order to be vibrant. We're in pet health and pet care, brands like Pedigree. We think we can double the size of the entire business over the next 10 years. As a company, you want to be sustainable, both in the way that you operate but also in what you put back into the ecosystem in which you operate.

If I were to simplify the portfolio, it breaks down into food, candy, and pets. That's not too logical. How do you make sense of that?

It seems logical to me. There's a lot of crossover in the way you build a brand—the geographies they're in, supermarkets and other places—but they are separate categories. They're very different businesses and have all got their individual visions.

Pets have become such a central part of the business. How big is it?

We don't publish accounts because we are privately held and family-owned. The entire business is about 115,000 or so associates [company employees] around the world and is well over \$35 billion. Pets are about half of that. It's well over in terms of associate base: Veterinary health on its own is about 70,000 associates. That's a pretty substantial size.

Why are pets such a good business?

We believe that if you create a better world for pets, they create a better world for you. I'll give you an example, a personal connection. When I was about 7 or 8, we went to get our first dog, Rascal, a Welsh corgi, which seems a bit strange given I'm Scottish. Since that day, I've loved dogs. It would come play with us. We'd walk it. It became part of the family. Look at the transition dogs have had over time. They may have been on the farm, but they've gone to the porch and now, in many cases, they're on the bed. My dogs, Ollie and Mattie, don't get to go upstairs, but they're family members.

I think you've answered it, but cat or dog person?

I like cats. I love dogs.

Are dogs the better business or cats?

We have pet food. From that perspective, cats are much more choosy about what they eat. Everyone who's got a dog or a cat will know that. If you put food in front of a dog, it ▶

◀ will pretty much eat, so you have to manage their nutrition in terms of the food that you're giving them. Cats are much more sensitive, much more delicate. It takes a lot more palatability. But they're both great businesses.

What are the advantages of working for a 100-plus-year-old, family-owned, privately held, secretive business?

The fact that I can sit down and talk to family members. It is their business, and they really care—about the brands, about our associates. That's a big difference. They take very little out. They reinvest in us. They reinvest in the consumer. That's one big difference in terms of the dividend level vs. some other companies. It's their approach and their love for the business. My job is to make sure that I'm setting us up for the next 100 years. To do that, you need a vibrant company that's growing, that's bringing in the best talent.

How many more generations of the Mars family will the company pass through?

Our vision is to keep our company privately held forever. We have "G3" still very active. We have a number of G4 on the board, and we have a number of G5 and G6.

Do they call themselves that?

They do, actually—otherwise I wouldn't be saying it.

You mentioned Mars is about a $35 billion-a-year business. What do you want that number to be, and how do you get there?

We think we can double it in the next 10 years. We've grown several billion in the last couple of years. But it's not just about growth for the sake of growth. Part of what we do is for higher-order purposes: The way we do business today creates the world we want tomorrow. We believe we have a sustainable generation plan. We believe the bigger we are, the more good we can do. But it's not just about being big. Performance without purpose is meaningless. Similarly, purpose without performance isn't possible. It's that magic combination.

It's a challenge, though, when you make an acquisition in the service space—for example, Veterinary Centers of America—while so much of your business is manufacturing. How do you decide if you're going to acquire vs. doing something homegrown?

We do both. It's a balance of the two. The services side is already 20 percent of the Mars Inc. business and about 50 percent of our employees. It's very substantial. When we look at potential acquisitions—pet health, services, but also consumer goods—we look if there's a match between philosophies and cultures. When you meet some of the owners of the businesses we're interested in, you can tell almost immediately if there's a fit or isn't.

Another challenge: sugar, which isn't particularly good for people. You also have unique insights into consumer behavior. What trends are you seeing?

First of all, I think our confectionery brands are treats and should be eaten as such. I love our confectionery brands. I was a boring dad until my daughter's friends heard I work for M&M's and Mars. Suddenly I was interesting. It's a great market. We're very aware of the growth in obesity and the amount of hidden sugar in products. We were the first to

"The way we do business today creates the world we want tomorrow"

put nutrition and calories on the front of packs. We were the first to really look at renovating the products and trying to change any saturated fat to unsaturated fat. We've really been very diligent. We're trying to move with the consumer, to provide choice. It's the right thing to do and we want to be transparent. We absolutely know that our sugar products should be enjoyed as treats. If you do, it's fantastic.

Nutrition is an area of opportunity, so I'm curious about your partnership with the Tata Group in India.

In India there's a tremendous issue with malnutrition and deficiencies in protein and other elements in the diet. We're working with Tata to launch a series of affordable products based on local tastes and local proteins. We just had our first few cases manufactured, and it's still very early, but we believe we have a really great product that meets the consumer need at a good price. And we'll have a flourishing business as well as doing something good. It's not a charitable contribution. It really is a business that we think makes a lot of sense.

The product is called GoMo Dal, and it's made of peas?

Yes, lentils and peas.

So why partner with something like that? Why not do it yourself?

Partnerships create credibility, that together you can do something good. I'll give you an example. In Côte d'Ivoire and Ghana we work with cocoa farmers and the issue of climate change. Those farmers are really struggling with productivity. We've partnered with the World Cocoa Foundation, other NGOs, as well as the government. We have an opportunity to fix the supply chain and create a movement very similar to GoMo in India.

Mars is such a global company and is dependent on raw materials, some of which come from faraway locations. How has climate change impacted your supply chain?

We're basically an agricultural company that takes ingredients, from corn to cocoa, and turns them into brands. That's really what we do. We're very dependent on the supply chain and the farmers. We believe climate change is real. So we've really got to play our part. We looked at our whole supply chain. We're working with cocoa farmers in Côte d'Ivoire communities, working with partners looking for ways to help improve productivity to manage some of the effects that are going on with that change.

Safeguarding your supply chain.

Exactly. I've walked a lot of cocoa farms in Côte d'Ivoire and Ghana. It's a tough, tough existence for them. When I was there, I asked probably 20 kids, "What do you want to be when you grow up?" The answer was everything from school teacher to doctor. But not one of them said, "cocoa farmer." That's obviously a challenge for our business.

Before you were CEO, you were in charge of Mars's chocolate business. Consumption is up, but cocoa is extremely vulnerable to fungal diseases. There's some concern about the longevity of the supply. How imperiled is the future of chocolate?

As a very wise man once said, "You can't make chocolate without cocoa." Farmers have to deal with things like swollen shoot virus and witches'-broom. We provided funding to map the cocoa genome and then gave the information free to the world to help us, to use the DNA structure to develop better hybrids—not GMO but faster hybridization. By investing in that, we're helping local farmers. A lot of them are in cooperatives run by women. We're really putting something back into the communities to allow them to flourish. At the same time, we get a solid supply chain. That's where the magic happens.

Where else is there room for improvement in the industry as a whole right now?

On cocoa, we're looking at tracking which cocoa batches are coming from particular areas so we can ensure that they're not from areas that are protected. That way we can avoid deforestation. There's really opportunities everywhere. The mission is to try and prioritize those. There are 25 million people in forced labor and slavery in all industries, according to the statistics from the International Labour Organization. We know we can't solve that on our own. I work with other members of the Consumer Goods Forum to try and create this movement of forward momentum.

Let's talk about packaging—something we all took for granted until we clogged the oceans with plastic. What can we do?

You've touched on a big challenge. If you look, 90 percent of Mars packaging is recyclable; 10 percent is still an issue, but it's even broader than that because, even if it's recyclable, is it really being recycled? We're looking at a multitude of solutions. How do you get away from plastic itself? You've got your single-use plastic, but how do you get it recycled? We don't have the answer for that, but we're working internally, as well as with suppliers and governments, to achieve that.

On global trade, the United Kingdom and China are important for Mars. Let's start with the U.K. What's your Brexit plan?

Before the referendum, we came out in public to say we believe that the U.K. is better to stay in Europe. The public voted, and we respect the public's vote. So, then, it's very important for everyone—Mars, the U.K., Europe—to have an orderly withdrawal. We're relatively fortunate because we have a big manufacturing base in the U.K. But we still need to bring in raw materials and to ship products around. No deal would be a worst-case scenario. I'm hoping that level heads will prevail, that discussions will go beyond politics.

What impact do you see coming from the trade war with China?

Just speaking for Mars, we see very little—mostly because of our philosophy and how we participate. When we go into a country, we put in manufacturing plants and build up raw material capabilities in those countries. We make most of our products for the U.S. in the U.S. We make most of our products for Mexico in Mexico.

We understand the pressure that others feel. We believe in free trade. We believe in the free movement of products. We've benefited from that. We're a global company. We've generated great livelihoods not only for our associates but for our supply base and those places where we participate. Free trade is good for all the economies in the world. Again, we hope that level heads prevail. I think the bigger issue isn't so much the transfer of commodities or finished products. It's bad for the markets, and it creates uncertainty in the mind of the consumer. When consumers are nervous and not sure what's happening, when there's a lot of ambiguity, they tend to step back a little bit. That's a potential impact. I think we're seeing some of that softening around the world.

As a business leader, what advice would you like to give to President Trump?

It's not about giving advice. We tend to stick away from politics. We've been in business 100 years. We've seen regimes change over time. We've seen a lot of politicians, not only in the U.S. but all over. We're in 80 countries, with 450 sites around the world. We've been through two world wars and multiple regional wars. It's not about politics. If you look at our business—our associate base, our customers, and our consumers—some are Republican, some are Democrat. So it's not about politics. My advice would be "Guys, let's think about what's right for the consumer, what's right for the country." Put it in a broader perspective. Treat everybody with respect just like we do at Mars. Have a sensible discussion. Come up with a solution.

Have there been any consequences for Mars as a result of the shutdown of the U.S. government?

We haven't seen any major impact. The uncertainty creates challenges—if you get 800,000 people who aren't getting paid. It would be nice to get that resolved and behind us. Over time, you want to be able to freely move goods across borders—it's good for the economy, it's good for business, and it's good for Mars.

Final question. On Halloween, how much pressure do you face to provide full-size candy bars instead of the mini ones?

Well, that's a good question. Where I live, we actually restrict Halloween to one street—and I'm not on that street. So it's a beautiful thing. B

Edited for space and clarity.

Welcome to Arbitration Hell

Millions of American workers sign away rights without knowing what they're in for: A journey to the ninth circle of a legal nightmare

By Max Abelson
Illustrations by Michael DeForge


WALL STREET
#ME TOO
CONTRACT
BONUS

The proof that the fight between Alex Beigelman and UBS had descended into absurdity was the dispute over the granola bar. It was the fifth day of arbitration hearings, and a lawyer for UBS, the financial conglomerate where Beigelman had worked, seemed to be having some windpipe trouble. “I tried to eat a Kind bar really quickly,” the bank lawyer said. “And I have all of that granola crunchy stuff stuck in my throat.”

“TMI,” answered Linda Friedman, the civil rights attorney who was representing Beigelman.

“I’m sorry, Linda, if you think that’s too much information,” the bank lawyer replied.

In front of the three arbitrators who would decide the case, Friedman challenged the opposing counsel’s familiarity with snack food. “It’s not,” she said, “a Kind bar.”

Beigelman was watching it all with a mix of bewilderment and fury. For three years he’d been scuffling with UBS Group AG, based in Zurich, over $1 million in pay he thought he was owed. In 2015 the bank let him go right before his bonus was due. He hired a lawyer and fought back. But because Beigelman had signed an arbitration agreement when he started his job, he was ushered into an enigmatic system of corporate justice where proceedings are secretive and the odds of workers winning are long. Beigelman’s hearings were held in a Lower Manhattan conference room during four days in October 2017. There was a five-month recess, and now, the following March, it seemed to be reaching a Kafkaesque, possibly even Dantesque, conclusion.

If you have a job in the U.S., chances are good you’ve signed an arbitration agreement that will stop you from suing your bosses in court for pretty much any reason. About 60 million Americans, including workers in two out of three big nonunion companies, are bound by the agreements, according to the Economic Policy Institute. Arbitration has sucked in bakers, bankers, engineers, exterminators, nurses, plumbers, roofers, teachers, and truckers.

After the #MeToo movement revealed that forced arbitration has been used to keep sexual harassment complaints quiet, a handful of companies, including Google and Facebook Inc., agreed to get rid of it for harassment claims. But that’s less a win for workers’ rights than it would seem. If you want to sue your boss for cheating you out of money or discriminating against you because of your race, you’re still out of luck, stuck in this shadow legal system. And yet no one except those who’ve been through arbitration understands what it’s really like, how it works, or whether it leads to anything resembling justice.

Beigelman and his lawyers decided to do something about that. Infuriated by their experience, they shared more than a thousand pages of transcripts with *Bloomberg Businessweek*. Reading through them doesn’t give the impression of grand injustice as much as it feels like getting stuck at an endless dinner with guests who despise each other. It would be funny if someone’s livelihood wasn’t on the line.

Was the arbitrator asleep?

The hearings were under way when one of Beigelman’s lawyers thought he saw Ken Stewart, the arbitrator in question, doze off. “He was right next to me,” the attorney, Matt Singer, recalls. Singer says his laptop power cord somehow got tangled with the sleeping arbitrator’s legs.

Stewart has no recollection of any naps. “Now, some of these cases, the testimony goes on and on and on, and sometimes the witness is very repetitive,” he says. “It’s a challenge for any arbitrator to have to keep paying close attention.”

The hearing was run by the self-regulatory arm of the finance industry, known as Finra. Banks and brokerages give the organization its money, and Congress gives it the authority to oversee Wall Street. It arbitrates thousands of cases each

year. The committee that looks after Finra's arbitration process is made up of outside lawyers as well as attorneys from UBS and other companies.

Finra also hires the arbitrators. If you want to make it onto the roster of people who can decide cases such as this one, you don't need a bachelor's degree or experience in finance and law, just some college credits, a few years of work history, and a thumbs-up from Finra. You can apply online. The pay is $300 per session.

The head arbitrator in Beigelman's case was Karen Bedrosian-Richardson, who has a background in insurance. "Do the arbitrators have any disclosures that they would like to make?" she asked at the outset, when the two sides sat down.

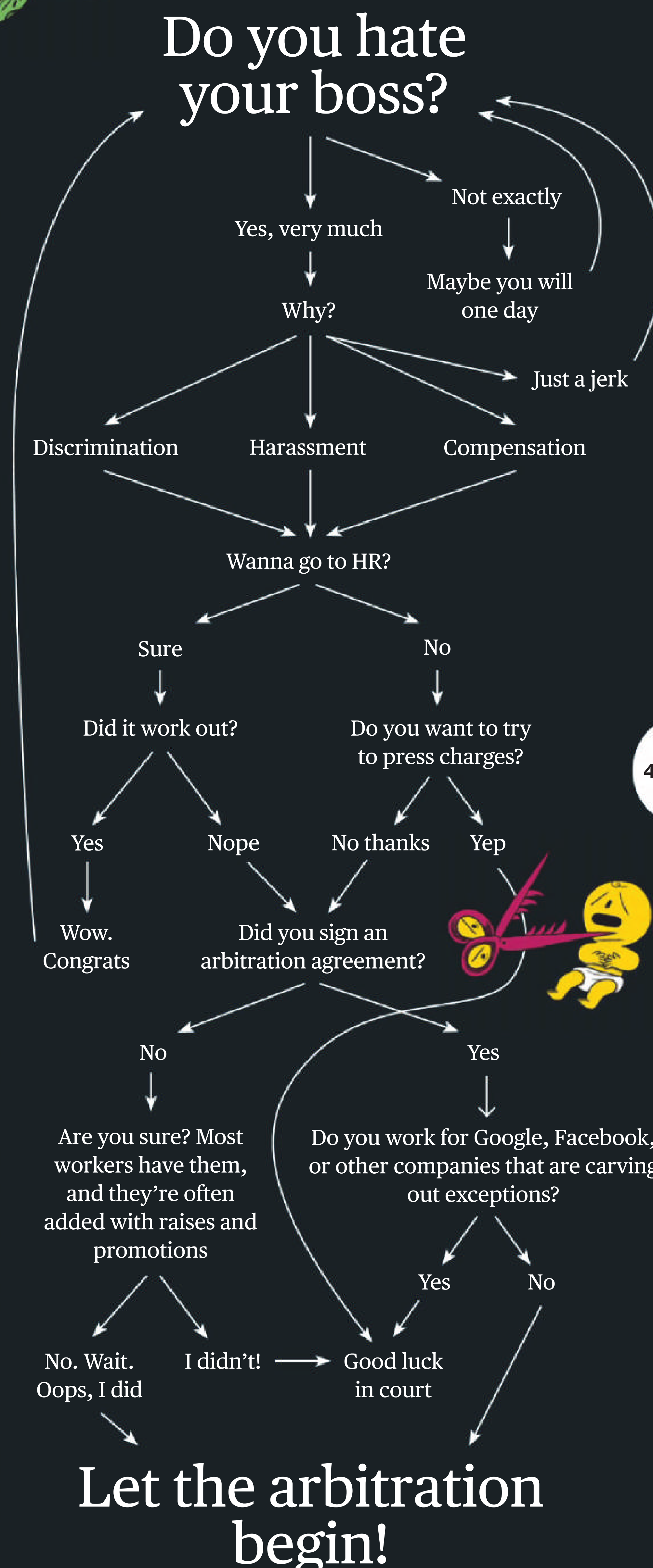
"I am legally blind," Stewart, the alleged napper, answered. "That will not limit my ability to perform my services." Bedrosian-Richardson then asked the group to speak loudly—because, she said, Stewart, who's 84, is also hard-of-hearing. The third arbitrator, Martin Dehler, used to be a bank executive.

The arbitrators had awkward news for Beigelman. His lawyers had written an account of what happened to him at UBS as part of a prehearing brief. The document was meant to help prepare the arbitrators for the case. Unfortunately, they hadn't received it, and no one was sure why.

That didn't shock Friedman, whose firm, Stowell & Friedman Ltd., specializes in labor law. She worked on the Boom-Boom Room suit, brought in 1996 by a group of women who accused Smith Barney of harassment and discrimination. The company ended up paying more than $100 million, and Wall Street reacted with pledges to curb mandatory arbitration—which of course didn't happen.

Introducing Beigelman's case, Friedman offered a version of events that, like so much good drama, was about betrayal. UBS, she said, gave her client positive reviews for his work on information security, then fired him to keep the bonus he was owed. UBS even held back money he was due as part of a deferred compensation package.

Friedman was up against Lloyd Chinn, a partner at the white-shoe firm Proskauer Rose LLP who specializes in defending finance companies against whistleblowers and harassment claims. He's the kind of expensive lawyer banks turn to when their in-house counsels aren't enough. "This is a very simple case," Chinn said. If Beigelman had just signed what UBS had asked at the time of his dismissal—a release of any and all legal claims against the bank—he could've gotten the deferred compensation but not the bonus, because those are for current employees. That might sound a little harsh, he added, but that's the way it goes. ▶



◀ Beigelman is 51, lives in a New York suburb with his wife, and has two children and a bunny named Moo. When he was around 8, his family immigrated from Ukraine to Queens, and he worked his way into Stuyvesant High School, the holy of holies for young overachievers in New York. He got his first programming job on Wall Street as an undergraduate at Polytechnic University, the Brooklyn engineering school that's now part of New York University, in the 1980s, which led to jobs at Deutsche Bank, JPMorgan Chase, and then, in 2007, UBS.

The bank made him head of information security for the wealth management division's Americas unit and promoted him in 2014 to managing director. It's a perch that young bankers and traders fantasize about: On Wall Street, it means you've made choice friends, vanquished the right enemies, and gotten on track to wield influence over both. It doesn't guarantee private-jet money, but the paydays are major.

Bonus season was coming up, and Beigelman figured he'd get at least the $468,000 the bank had handed him the last time around. That's not what happened. He got a message two weeks into 2015, met an executive on a Tuesday, and was told he was now redundant and would be terminated.

Then Beigelman learned that he wouldn't be getting a bonus. If he wanted his deferred comp, about $530,000, he'd have to promise not to fight the termination. He did not agree to that. His 2007 offer letter from the bank had included a clause about settling disputes in arbitration, and two months after he was fired he demanded a hearing. But his contract didn't necessarily stop him from bringing an ambitious kind of lawsuit called a class action, a high-stakes way to band together with others in court. Right before Christmas of 2016, he filed one with a former colleague that claimed it was illegal for the bank to keep all that money from workers who'd been laid off. The lawyer representing UBS in that case was Eugene Scalia, son of the late Supreme Court justice.

That coincidence gained extra resonance when the high court's conservative majority decided last May that companies can use arbitration to stop employees from bringing class actions. UBS has already used the ruling to argue that Beigelman's lawsuit is doomed.

If both sides actually want to be in arbitration, the process can be fast, cheap, and effective. That's how UBS justifies it: "Arbitration, as recognized by courts, can be a fair but more efficient method," says spokesman Peter Stack.

The process has a long history, going back at least as far as the Judgment of Solomon, the Old Testament story about the two mothers ordered to split a disputed child in half. Phoenician traders, an Athenian tyrant, and Marco Polo-era caravans had arbitration systems. In the U.S., Congress enshrined it in law a century ago.

But it wasn't until the past three decades that vast numbers of American employees were pulled into arbitration with no choice. One of the key legal precedents sounds like the setup of a bad Borscht Belt joke: There was a husband-and-wife undertaker team in Yonkers named McMahon who met a stockbroker named McNulty. The couple invested their savings, hundreds of thousands of dollars got wiped out, lawsuits flew, and McNulty's company wanted to enforce its contract's arbitration provision. The McMahons said it was the American way to face a jury. In 1987 the Supreme Court decided in the brokerage's favor. Four years later it sided with Wall Street again, forcing an employee into arbitration after he alleged age discrimination.

Today, millions of workers can be steered from courtroom litigation into a venue that gives them worse odds of winning and smaller judgments if they come out on top, says Alex Colvin, who teaches at Cornell and wrote the Economic Policy Institute study. He describes mandatory arbitration as unfair and ridiculous: "It's halfway between *Law & Order* and *Judge Judy*," Colvin says, "except nobody's wearing robes."

At times, the Beigelman proceedings did seem like daytime TV. "I would like you to listen," Chinn, the UBS lawyer, told Beigelman at one point. He went on. "Maybe you're not understanding."

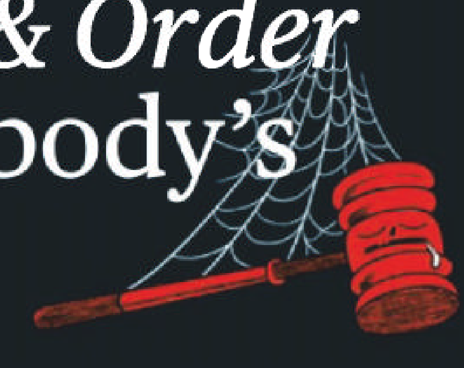
"You're asking me a question," Beigelman said.

"I want to try this again. I'm trying to finish your cross-examination today."

"And I'm answering the question."

"So now I get to ask you some questions. You understand that is the process?"

"It's halfway between *Law & Order* and *Judge Judy*, except nobody's wearing robes"



"I do speak English, yes."

The gulf between this system and the courtroom is why some attorneys adore arbitration. Steven Suflas, a veteran lawyer with financial clients, sees it as a way to stay away from the regular folk who decide big cases. "Who sits on juries, managers or employees?" he asks. "Employees, all right. Tongue in cheek, every employee hates their boss. It's human nature." An arbitrator, on the other hand, "tends to be less emotional," he says.

Another plus, in Suflas's eyes, is secrecy. The public doesn't need to find out about "juvenile behavior at the office holiday party" or every "bad boy who's behaved badly," he says. "Does the shining of the light on that improve things? No."

The state of New York disagreed, banning mandatory arbitration for harassment claims last year. Barely a few days went by before attorneys inside Sullivan & Cromwell LLP, the powerful law firm, sent out a memo that told clients a loophole could actually make it toothless. A similar thing happened when the news hit that Facebook, Google, and Uber wouldn't force workers into arbitration. It turned out the companies were applying that change only to harassment or assault.

One of the most memorable interludes of Beigelman's hearings began when Chinn asked him if he had worked in human resources.

"I did not work in HR," Beigelman replied.

"And you certainly didn't make the decision with respect to your termination, correct?" Chinn asked. Beigelman seemed to realize what the lawyer was getting at: Chinn was asking, in a roundabout way, if the employee had decided his own fate.

"Certainly not," he answered.

Beigelman wanted the arbitrators to hear from an HR manager at UBS. But it turned out the woman was named on the bank's witness list, not his own. Now Chinn announced that the bank wouldn't be calling the manager. When Friedman protested, the UBS lawyer said that if she wanted to hear that witness so badly, she should have asked earlier.

"We agree with that," Bedrosian-Richardson, the top arbitrator, said. To save money and time, the system limits testimony during a hearing, just as it cuts down on the documents the two sides have to share beforehand, and stops almost everyone from appealing afterward.

"Excuse me a moment," Friedman said. "She's outside in the hallway."

"No," Chinn said, declining to bring in the bank employee.

Eventually the UBS lawyer relented, the witness answered questions, and the bank's team made a motion to dismiss Beigelman's case. "You have to be employed when the bonus is paid," Chinn said. "Period. End of story. You must be there." At this moment of high drama, the granola struck.

Friedman's argument was that UBS had robbed Beigelman by changing its pay policy after he'd already been hired, now forcing redundant workers to sign releases before they could get their deferred compensation and burying the new rule "in an appendix to an appendix."

After Chinn's rebuttal, she tried to continue her argument and got cut off. "No," Dehler, one of the three arbitrators, said. "I think we've had enough."

Later, Chinn was offering up some final words on behalf of the bank, but apparently Dehler was not in the room.

"I do object to this entire speech while one of the arbitrators is in the bathroom," Friedman said.

Reading page 1,382 of the transcript, you can almost imagine a door swinging open theatrically as the arbitrator returned: "I'm sure you can fill me in," Dehler said.

In May 2018, two months after Beigelman faced UBS in the conference room for that last time, the arbitrators handed down their decision. They awarded him more than $400,000, giving him the deferred comp, but allowed UBS to keep any bonus. Beigelman, who now runs his own risk advisory company, is less annoyed by the decision than by the process that led up to it. What bothers him, he says, is getting stuck in such a strange world for so long and knowing how many people will have to endure the same.

"He's going to be OK," Friedman says. "He's a survivor." Beigelman is also a Wall Street veteran who earned more in one year than many regular people will make in a lifetime. For some workers, Friedman continues, "the system does not work." Even so, she found the process so senseless that she decided not to charge Beigelman any fees.

The week of the decision, Uber yielded to pressure from labor advocates by announcing it would allow workers to take individual harassment and assault complaints into courthouses.

A few days later, an industry group called the American Arbitration Association released chipper news: The number of employment arbitration cases had shot up about 10 percent. "We look forward to positive challenges and even greater success," the report announced. Ⓑ

Disruption

I used to think about ride-hailing apps in terms of price and convenience.

Then I nearly died using one

By Yoolim Lee and Illustration by Ping Zhu

Me

On March 26, 2018, the news in my world was all about Grab. The local ride-hailing startup had just announced it was acquiring the Southeast Asian operations of its biggest competitor, Uber Technologies Inc. In return, Uber would get a 27.5 percent stake in Grab Holdings Inc.

It looked like a clear win for the hometown company. Founded in a Kuala Lumpur storage room as a taxi-booking app, Grab had moved its headquarters to Singapore and survived Uber's relentless price wars in the region. As it expanded its operations to eight countries, its valuation had risen to $6 billion. "Today's acquisition marks the beginning of a new era," Chief Executive Officer Anthony Tan said in a statement about the deal.

I wrote the story for Bloomberg News, where my beat is startups. But Grab had become such a part of life in Singapore that it barely registered that I was using its app the next morning when I ordered a ride to my daughter Anika's kindergarten graduation. The cost, S$24 (about $17.50) for a 12-minute trip, seemed a bit high, but I had a promo code to get S$4 off. Thanks to price wars, there was always a promo code.

Discounted fares are only part of Grab's appeal. If there's any place on Earth that was made for a ride-hailing app, it's Singapore. The city-state is among the world's most expensive places to own a vehicle because of high taxes, congestion pricing, and rules that require owners to dispose of their cars after 10 years, by either scrapping them or selling them overseas. Before the ride-hailing apps came along, it was difficult to find a cab during rush hour.

With Grab and Uber fighting for market share, rides through the apps were cheaper and more widely available than cabs, but the drivers weren't always as experienced. While taxis would hurtle confidently down the narrow one-lane road where I live, many Grab drivers would creep at a snail's pace, then make multiple attempts to turn back before knocking down our garbage bin and escaping, often while swearing. Others would simply wait at the end of the road.

My Grab driver that morning was one of the latter. An older Chinese man wearing a cap, he was standing by a white Mazda when I walked over. It was an especially sultry day, even for Singapore. The sky above our neighborhood was thick with clouds. I felt the faintest drizzle.

"Good morning, Uncle!" I greeted him. (All the city's middle-aged cabbies are uncles or aunties.) I hopped in.

As we set off, I noticed he was taking an unusual route. Instead of heading for the expressway, he turned in the opposite direction and took local roads, following GPS directions shown on the Grab app on the smartphone mounted next to his steering wheel. I was going to tell him there was a better way but decided against it. I figured the app must have known something I didn't.

The first thing I remember about the accident was the sound of thunder. The second was realizing the sound wasn't thunder, but my head banging against the window. We'd sped through a junction where my driver was supposed to stop and had collided with a black Mercedes-Benz.

A moment later there was another loud noise—the sound of a second car, a Honda, crashing into my door. The contents of my blue purse scattered in every direction.

When it was over, I couldn't move my upper body. I was in more pain than I'd ever experienced, my left side felt numb, and it was hard to breathe. I could see my driver, the man I'd called Uncle, frantically trying to open his jammed door. As I watched, he crawled over to the passenger seat and let himself out. He didn't turn back. I tried to scream, but no sound came out.

Eventually, a woman came over to check on me and offered to call my husband, Sagar. When I couldn't remember his phone number, she grabbed my phone and called him herself. Then she called an ambulance.

At the hospital, X-rays were taken, blood drawn, a catheter inserted, and a "computed tomography angiography" performed to examine my blood vessels. In the end, the doctors told me I had a cervical vertebrae fracture and vertebral artery dissection. In other words, the accident had broken my neck and torn one of my body's most important blood vessels. ▶

◀ I was at risk of blood clots, which could lead to a stroke.

The next day, a Grab safety and security manager showed up in my room and said he wanted to see how I was doing. Sagar told him politely that I wasn't in a physical or mental state to see anyone and wouldn't be for some time. But he showed up again the following day, when I was alone in the room, causing me to start crying uncontrollably.

A few days after the accident, Tan, the CEO, texted and asked if he could come visit me at the hospital. He had never texted me before. I said I appreciated his thoughts, but there was no need, since I would soon be discharged. An outspoken Christian, he asked if he could come over and pray with me. Two weeks later he visited me on a rainy Sunday afternoon and brought flowers and bird's nest drinks, a popular get-well gift in Southeast Asia made from the nests that swiftlets build with their saliva. (The concoction is expensive and supposed to be good for you, but I'm from Korea, where the drink isn't common. I'd never tasted it and had no desire to try it.)

I was wearing a neck brace and couldn't move much, which left me feeling like a sad C-3PO from *Star Wars*. Tan took my hand, and I sat quietly while he prayed aloud. I knew he meant well, but I'm not religious, and I wasn't sure how prayer was going to address the pain or the vague sense I felt that Grab might have let me down somehow.

"I can't stop apologizing for the pain I caused

When he finished, Tan asked if there was anything more he could do. I asked him about my driver. Who was he? How long had he been with Grab? Did he have a clean record? Tan said he had a memo about the accident. He scrolled through his inbox for a while but said he couldn't find it.

In the months that followed, my journalistic curiosity took over. I began to wonder not only about my driver but also about all those who've poured into ride-hailing cars on the streets of Singapore and around the world. Were these companies doing enough to protect passengers from negligent drivers? Maybe Grab's growth and its perceived triumph over Uber the day before my accident had come at a cost. Was it possible that, for all the convenience ride-hailing services offered, they were making cities less safe?

I first met Tan and his co-founder, Tan Hooi Ling (no relation), in early 2016 at a Grab event I was covering. It was at an old chapel-turned-restaurant where Tan had celebrated his wedding seven months earlier. The mood was joyful. Grab had just achieved a valuation topping $1 billion—still tiny compared with Uber, which was worth $63 billion at the time, but huge by the standards of local startups. Anthony Tan, then 33, said he would "build the greatest technology company in Southeast Asia."

Youthful and fit, with thick, dark hair, Tan is outgoing—he's always greeted me with a hug—and very determined. "Anthony, he's competitive," a venture capitalist who's known him for many years once whispered to me, as if sharing a great secret.

Like many CEOs, Tan sometimes talked about "servant leadership," but unlike any I'd met, he defined the concept in theological terms. "If Jesus can wash his disciples' feet, then who am I?" he once asked me. One of his favorite lines, "We are so blessed," was a sort of catchphrase among employees.

While Uber executives seemed to relish the role of disrupter, Grab portrayed itself as a sober, law-abiding startup keen to cooperate with taxi companies and regulators. That paid off, especially when Uber was confronted with a series of scandals in 2017, including reports that an executive had obtained and circulated medical records of a woman who was raped by her driver in India. After the Uber merger, Grab had raised more money, this time valuing the company at $14 billion, according to a person familiar with the financing. It now has operations in 235 cities across Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

As I recovered, though, I reconsidered the conventional wisdom about Grab. I remembered I'd once had a driver who dozed off behind the wheel on a highway. When I frantically got his attention, he told me he'd been driving more than 12 hours to earn a bonus. I'd had an equally scary experience in an Uber, when a driver who kept randomly hitting the brakes confessed she hadn't been behind the wheel of a car in years.

Singapore's government requires drivers for services such as Grab to be licensed, a process that includes a background check, medical screening, classroom instruction, and a written test. The city-state used to require 60 hours of training for taxi drivers to earn a vocational license. That's now 25, which is still longer than the 10-hour course required for private-hire car drivers. In those 10 hours—two of which can be done outside the classroom as "self-study"—applicants are supposed to learn all they need to know about service quality and road rules.

After I returned to work in May, I began digging into the licensing process. Before July 2017, the government had allowed drivers who applied for a new mandatory vocational license a one-year grace period during which they could take the course and pass a written test. But of the 42,900 private-hire car drivers in this category, only 22,000 had managed to get a full license within a year. The implication, to me anyway, is that roughly half of these drivers shouldn't have been on the road in the first place. The Land Transport Authority says the vocational license is designed to protect drivers and passengers and that as of Nov. 1 there were 37,000 license holders.

It was around dusk on a Sunday four months after the accident when I arrived at the apartment building of my Grab driver. For a long time, he'd been just a license plate number and a name—Chia Chong Meng. Then, through a request for traffic accident reports, I found his address. Before entering, I walked around the playground behind his building, working up the courage to face him.

The home was on a high floor. Like many in Singapore, he kept the main door open for cross-ventilation, securing the apartment with a wrought-iron gate and large padlock. Inside, I could see an old sofa, a sewing machine, and an altar with a statue of Kuan Yin, the goddess of mercy in the Taoist tradition. A woman was making dinner in the kitchen. She saw me at the door and called for Chia in a Chinese dialect.

Eventually, my driver appeared, bare-chested and wearing red shorts. Without his cap, he looked far older than I'd remembered. He was bald, with sunken cheeks and deep wrinkles.

"It was not my fault!" he said in halting English when I told him who I was, still standing behind the gate.

When I said I'd mostly recovered, he took a step closer. "Why didn't you help me or call an ambulance?" I asked.

There were other people at the site who could help, he mumbled, adding that he'd tried to open my jammed door.

He continued, calling Grab "Grape." I gathered he was trying to say that he, too, was in shock at the time of the crash.

"I was very angry at you," I said, my heart beating fast.

Chia nodded. "Of course. I would be angry, too," he said.

He said Grab had suspended him for two months after the accident, then let him go. He'd paid a S$200 fine to the traffic police, which had concluded he'd been at fault. He said he'd also received nine demerit points on his license. (Under Singapore's demerit points system, drivers can have their licenses suspended if they accumulate 24 demerit points within two years.) He was working part-time jobs to make ends meet, and he still owed the company that had rented him his car S$3,500 to cover the costs in excess of his insurance coverage. He was broke, he said, gesturing helplessly.

you. I hurt you"

Chia told me that he was about 70 years old and had been a construction worker as a young man before driving a taxi on and off for 40 years. During that time, he said, he'd had several "small and big" road accidents. He said he'd been driving for Grab for just over a month when he picked me up that day.

"Small and big accidents?" I asked. He nodded. I asked him how he'd passed Grab's driver-screening process. He said there was no issue, because he already had a taxi driver's license. Grab says that at the time of the accident, Chia had a valid license and had completed more than 500 rides on the platform with a good passenger rating, and his record was spotless. Grab notes that Singapore law forbids the company access to driving or criminal records, and that authorities wouldn't have issued a vocational license if they judged Chia to have a poor record.

We chatted some more—Chia inside his flat, me on a step below the entry, the gate between us. My neck was killing me.

I realized he hadn't intended any of this mess. He was just a guy who would get up at 6 a.m. and try to make a living. I'd been his second passenger that morning. He and I had been brought together by the technological revolution taking place in our city.

"Uncle, I'm not angry with you anymore," I told him as I left, feeling strangely at peace.

Chia smiled and said softly, "I am sorry. I didn't want to give you this kind of trouble."

On my way home, I wrote down in my notebook only some of what the accident had cost everyone.

Me: left vertebral artery.

Driver: livelihood + S$3,700 in fines and expenses.

Grab: S$20, the refund they'd given me after the accident.

Shortly after I returned to work, I found myself at Grab's swanky new offices for a media event. The building, in Singapore's central business district, has more than 70 conference rooms named after big cities in Southeast Asia and subway stations in Singapore. Each has walls with frosted glass featuring a different design.

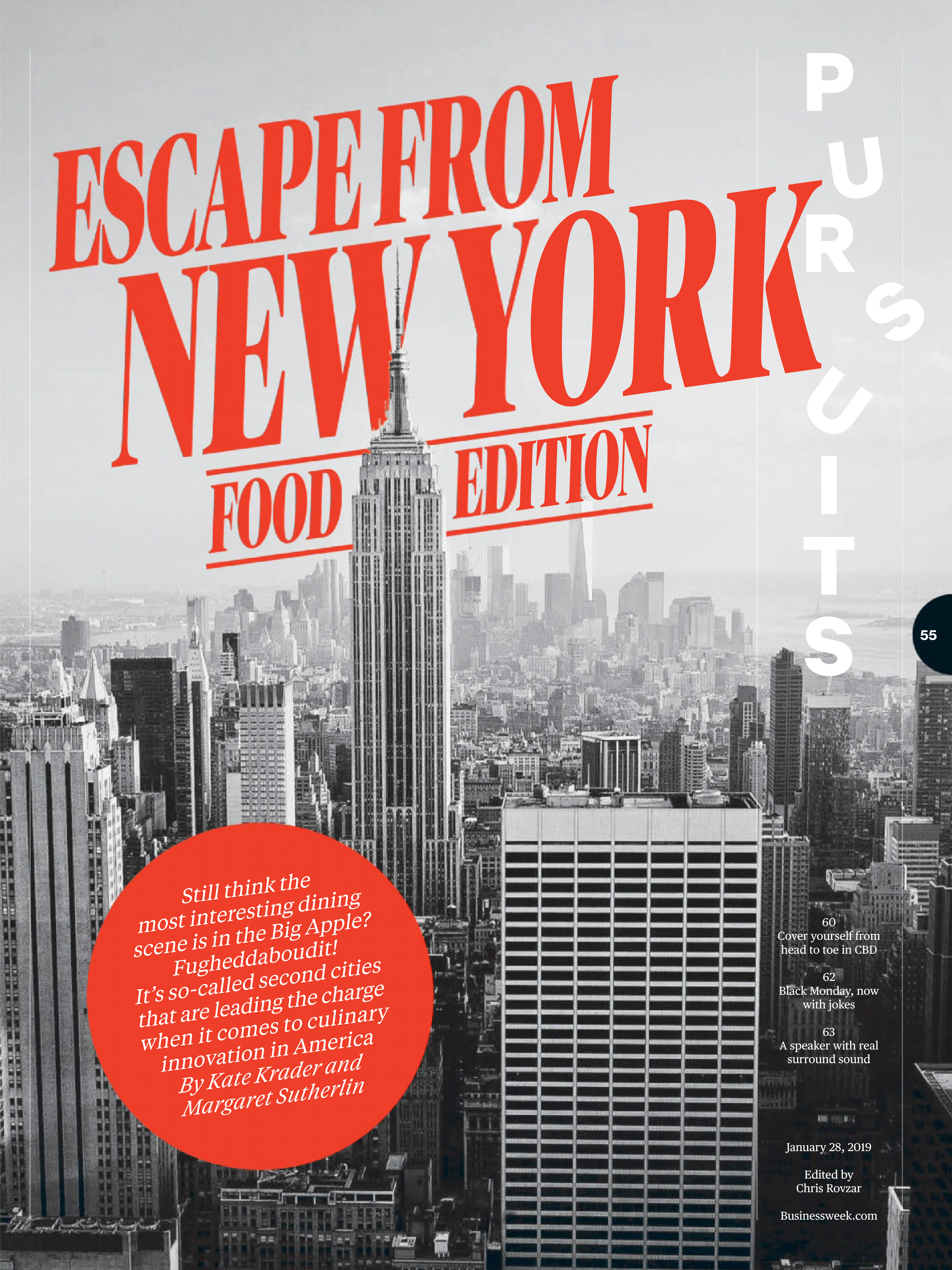
I hadn't expected to meet Tan, but I was escorted into a conference room where I found him waiting for me. The space was decorated with a small table, a daybed, and a ride-on toy car with the name of his young son on it. I felt myself trembling as I asked him about Grab's safety procedures. Following my accident, he told me, the company had started reviewing its entire safety system. Then he leaned forward and said, "I can't stop apologizing for the pain I caused you. I hurt you."

In October, Grab held a press conference to announce its enhanced safety measures. They included using the data collected by the company's app to monitor driver fatigue and driving patterns. Like Uber and the Chinese company Didi Chuxing, Grab has installed an emergency button on its app, and riders can add emergency contacts. The company said it will double its investment in safety measures by the end of 2019 and that incidents were already trending down. Its incident rate, which includes traffic accidents and complaints about driver behavior, was 40 percent lower in the third quarter of 2018 than it was a year earlier. But the data lacked substance. Grab didn't provide any breakdowns of the number or details of the incidents. The company says it is "working with local governments as part of a safety task force to formulate benchmarks for the industry."

During our meeting, Tan remarked on my recovery. "You look great compared to the last time," he said enthusiastically. "Vibrant and healthy!"

It was only partly true. Since the accident, the feeling has returned to my left side, but my left thumb remains numb, reminding me constantly of the trauma. I still have pain in my neck and shoulders, and I'll have to get regular scans of my blood vessels for the foreseeable future.

I'm grateful that I'm otherwise better, but I'm also more aware of the profound compromises we've made in giving tech companies, even those with well-intentioned CEOs, so much power over our daily lives. Tan showed me kindness in the months that followed my accident. But we deserve more than expressions of remorse from companies such as Grab. Detailed safety records would be a good place to start. B



ESCAPE FROM NEW YORK
FOOD EDITION

Still think the most interesting dining scene is in the Big Apple? Fugheddaboudit! It's so-called second cities that are leading the charge when it comes to culinary innovation in America

By Kate Krader and Margaret Sutherlin

January 28, 2019

Edited by Chris Rovzar

Businessweek.com

SO, WHAT'S A SECOND CITY, ANYWAY? The locations selected here traditionally have been overshadowed by a larger metropolitan neighbor. (These spots are all east of the Rockies; most cities on the West Coast don't have the same sense of culinary rivalry.)

Dinner at Suraya

Philadelphia

The City of Brotherly Love is a delicious affair

A decade ago it would have been inconceivable that Manhattan East Side real estate would be advertised for its proximity to Queens. Then came the announcement of Amazon.com Inc.'s second headquarters, in the outer borough. Equally incredible would be the idea that New Yorkers would covet any Philadelphia food beyond a cheesesteak. Yet Philly has a scene that is outpacing the Big Apple's for several reasons. First, rents are cheaper (see below). And New York's new minimum wage law mandates $15 an hour for employers of 11 people or more, while Philadelphia's minimum wage is $7.25. Such economic realities are incentives for enterprising chefs who once would have felt the need to make their name in Manhattan. Another, less-heralded reason is Pennsylvania's archaic BYOB laws: Liquor licenses are prohibitively expensive in Philly, so restaurants have had to make their food notable because they can't make much money on liquor. Meanwhile, local chefs have gained a national profile. Michael Solomonov, chef and co-owner of Israeli restaurant Zahav, was named Outstanding Chef by the James Beard Foundation; Stephen Starr, another longtime local legend, was awarded Outstanding Restaurateur.

La Colombe, one of the country's premium coffee chains, started in Philly in 1993. It now has cafes nationwide and sought a $1 billion valuation in 2018. Twenty-five years ago, founder Todd Carmichael scouted a few East Coast cities including New York, Atlanta, and Miami with $100,000 in travelers checks in his hand. He got a meeting with Governor Ed Rendell, who said he'd back the project. "Could I have gotten a meeting with the governor and started my company with $100K in New York?" Carmichael asks. "No way."

CRUNCHING THE NUMBERS

- $1.9 billion: Amount that visitors to Philadelphia spent on food and drink in 2017, a 5 percent increase from the year before.
- 391: Percent increase in outdoor seating since 2001.
- 27: Percent of total tourist spending that went to food and drink in 2017.
- $5,000: The monthly rent at Dizengoff, the hummus-focused spot in Center City from chef Michael Solomonov and Steve Cook, a former analyst at Blackstone Group LP. At its Chelsea Market location in New York City, rent was $20,000 a month for a similarly sized space. (It closed in August.)
- $35,000: Total for Cook and Solomonov to open the original Federal Donuts in 2011. "It would have cost half a million dollars to do it in New York," Cook says.

The Checklist

IRWIN'S UPSTAIRS
Located on the top floor of a former vocational school, this hard-to-find spot features graffiti on the walls, views of the city, and quirky Mediterranean shared plates like lamb kofta two ways.

PALIZZI SOCIAL CLUB
This recently renovated 101-year-old venue specializes in expertly made classics including Caesar salad and egg yolk-filled ravioli. Its history is inescapable: Even the drinks are named for past presidents of the club.

LOKAL HOTEL
The Philly-based mini hotel chain promises rooms outfitted like stylish apartments and "invisible service"—with no staff. The newest location is in trendy Fishtown.

SURAYA
Highly anticipated when it opened in 2017, Suraya revealed intriguingly spiced dishes and a bakery counter. Now this Lebanese restaurant with a light-filled outdoor garden and a market selection of specialty foods and goods has become a staple in Fishtown.

THE BOURSE
Set in an 1890s Beaux Arts building that used to house the commodities exchange, this food hall serves local delicacies like sandwiches from South Philly's Rustica Rosticceria and cocktails by Bluebird Distilling.

Irwin's Upstairs

SURAYA: HEIDI'S BRIDGE. IRWIN'S UPSTAIRS: MICHAEL PERSICO. PREVIOUS PAGE: YIMING CHEN/GETTY IMAGES

San Antonio

Remember more than the Alamo in chili con carne's birthplace

When it comes to food, San Antonio's reputation used to be defined by Tex-Mex. But over the past decade, the south central Texas city has broadened its culinary appeal to challenge its more famous foodie neighbor Austin. Much of the credit goes to the Pearl, the former brewery that's been developed by billionaire Christopher Goldsbury. The 22-acre location opened in 2008 and houses 19 food and beverage spots. Opening in January is Savor, a restaurant from the Culinary Institute of America that will be a training ground for aspiring chefs. "When we started with three culinary operators, even that felt risky," says Elizabeth Fauerso, the Pearl's chief marketing officer. "San Antonio did not have a reputation for supporting chef-driven restaurants." Now it's also home to Hotel Emma, a 146-room property with a grocery kiosk, Larder. "It's still wide open here," says native Charlie Biederharn, co-founder of Bakery Lorraine, which has five locations in San Antonio.

Lemon sorbet at Mixtli

- 37 million: Number of visitors to San Antonio in 2017; in 2015 it was 34.1 million, according to Visit San Antonio.
- 25: Percent of total expenditures that tourists spent on food in 2016, up from 21 percent in 2012, according to travel research company D.K. Shifflet & Associates Ltd.
- 2: Number of cities in the U.S. designated as Unesco Culinary Heritage sites. San Antonio is one; Tucson is the other.
- 2013: The year that Steve McHugh, an alum of John Besh's restaurants in New Orleans, started the popular meat-centric restaurant Cured at the Pearl. He was one of a number of chefs who moved to San Antonio following Hurricane Katrina.

BOTTLING DEPT FOOD HALL
Built on the original site of the Pearl brewery's bottling department, San Antonio's first food hall features local vendors such as Maybelle's Donuts, the latest hit from the co-founders of the popular pastry shop Bakery Lorraine.

CLEMENTINE
Opened in early 2018, this Castle Hills spot features updated Southern cooking. Try the country-fried quail with pickled peppers and spicy mayo.

MIXTLI
Offering a "progressive culinaria" tasting menu, this Mexican restaurant is located in a converted rail car inside "the yard" in Olmos Park.

ALAMO BBQ CO
A collaboration between the Two Bros. BBQ Market and the local empire-building chef Jason Dady. The specialty here is Texas-style barbecue in the form of smoked beef brisket and sausage.

Minneapolis

Sophisticated cuisine without the big-city pretense

"Twenty years ago, most restaurants were chains or corporate," says Ann Kim, chef and owner of Young Joni. "There weren't lots of smaller, chef-driven spots." Today, with 18 Fortune 500 companies headquartered in the area, Minneapolis chefs have discovered the more "sophisticated" palates of well-traveled executives, says New York transplant Gavin Kaysen of Spoon and Stable Restaurant and Bellecour. Minneapolis has added people, too—about a quarter million new residents since 2010—but the cost of living has remained lower than many Midwestern metro areas, including Chicago. Neighborhoods beyond downtown have become destination-worthy as well: North Loop is the most happening, but Uptown, Linden Hills, and Lowertown in neighboring Saint Paul all have thriving dining scenes.

- 40,000: Number of square feet that Minneapolis native and James Beard winner Andrew Zimmern was tapped to develop as a food hall. It's part of a $200 million mixed-use development named the Dayton's Project that opens this year.
- 2 million: Number of theater tickets sold each year in Minneapolis, according to the MSP Economic Development Partnership. Only New York has more seats per capita in the U.S.
- 16: Counties that make up the greater Minneapolis-Saint Paul metro area. In November, Minneapolis approved a $2 billion expansion of its rapid transit systems connecting bustling suburbs Eden Prairie, Woodbury, and Brooklyn Park to the city.

The counter at Bellecour

BELLECOUR
Before Gavin Kaysen's tasting menu venue Demi opens in February, revisit his French restaurant in suburban Wayzata.

YOUNG JONI
Ann Kim's simply prepared wood-oven pies at Pizzeria Lola put her on the map, but her buzzy North Loop restaurant adds more exotic ingredients to pies—Spanish chorizo, La Quercia prosciutto—to pair with cocktails including sarsaparilla and caipirinhas.

GRAND CAFE
Jamie Malone has lovingly reimagined this local favorite. She kept the name but put her own spin on its classic French fare.

MIXTLI: STARCHEFS. BELLECOUR: ELISEA JOHNSON

Indianapolis

On the fast track to fine food


The garden at Public Greens

Its name may still conjure images of car racing, but Indianapolis, just three hours south of Chicago, is taking its own victory lap when it comes to imaginative and innovative food. That success is due in part to public and private partnerships ushering people to foodie destinations including Fountain Square and Broad Ripple Village. The 16-mile Monon Trail and the 2013 opening of the Cultural Trail were two of the milestones that connected residents of the northern suburbs to downtown dining.

Other fundamentals such as a low cost of living, a business-friendly climate, and supportive leaders contribute to the city's development, says Isaac Bamgbose of Hendricks Commercial Properties LLC, the developer behind the BottleWorks food hall, office, and residential complex in the Massachusetts Avenue Arts District. "There's a vibrancy here to grow and do better than the past," he says.

Meanwhile, major companies such as Salesforce.com Inc. and Roche Diagnostics have expanded in the city and tapped an eager workforce coming out of area universities, helping stem a brain drain to the coasts. Couple that with the city's expertise as a sports host, and there's a guaranteed number of regular international tourists flooding hotels and restaurants.

The result is a fertile food environment: Neal Brown makes stellar cocktails and "bar food" every night at Libertine Liquor Bar, and his most recent project is the popular *omakase* spot Ukiyo. The city's premier restaurateur, Martha Hoover, has expanded her Patachou empire into five concepts and 14 locations. Meanwhile, Jonathan Brooks upends traditional Midwestern dinner at his neighborhood restaurant Beholder; his Milktooth, on the other hand, reinvents the basic brunch of pancakes, eggs, and bacon. "I was shocked by the local and national enthusiasm," says Brooks. "Chicken livers and uni for breakfast? People embraced it."

- 28.2 million: Number of tourists who visited Indianapolis in 2016, the most ever. It was the city's sixth straight year with an increase in visitor spending.
- 34: Percent on average by which Chicago is more expensive than Indianapolis.
- $2.8 billion: Value of the investments that are in the works through 2022 in downtown Indianapolis.
- 64: Percent of downtown restaurants that are locally owned.
- 2020: Year that Bottleworks, a mixed-use development, is set to open in an art deco Coca-Cola factory. It'll have a food hall, offices, and residential space, as well as the first-ever West Elm hotel.

BEHOLDER
Jonathan Brooks's ode to Midwest ingredients is defined by his imaginative preparations.

UKIYO
A Japanese-inspired, reservation-only bar from Neal Brown that also serves ramen and Kappo-style (i.e., small) plates.

OCA
Indianapolis's charcuterie experts Smoking Goose offer up high-end hot dogs (think currywurst topped with crab slaw) inside Sun King Brewing.

INFERNO ROOM
This hip Polynesian-inspired cocktail bar in Fountain Square is from Ed Rudisell, one of the city's most inventive restaurateurs.

PUBLIC GREENS
The latest from Martha Hoover's team serves seasonal salads and plates of fresh veggies including produce that is grown on-site.


Grilled cucumbers with caviar at Beholder


The bike path on the Monon Trail

PUBLIC GREENS: PATACHOU INC. BEHOLDER: MALLORY TALTY. MONON TRAIL: COURTESY VISIT INDY

Asheville

A hub for craft beer gets a reputation for memorable food

On the face of it, Asheville has a few things in common with celebrated neighbor Nashville: great music, notable art galleries, and a food scene that is dramatically raising its profile. But while the "Nash-vegas" moniker took hold of the Tennessee capital, thanks in part to restaurateurs from other cities expanding there, North Carolina's Asheville was forging its own reputation. For a while it was the craft beer that drew travelers—the city consistently ranks as one of the top three in the U.S. for beer drinkers—but now it also has destination restaurants. Katie Button, an alum of El Bulli in Spain and a protégé of José Andrés, will inaugurate Chow Chow, a food festival that focuses on local vendors, later this year. Until then, check out her bagel shop, Button & Co., which uses locally milled grains for an Ashevillian take on the New York classic. Fig and sorghum is a seasonal flavor blend you won't find at many bagel shops.

French Broad Chocolates in downtown Asheville

● 33: Number of breweries in Asheville, which was named the best beer-drinking city in 2017 by financial advice website SmartAsset. One reason craft brewers like the area is the quality of the local mountain water, according to Lee Wong Ashburn, president at Highland Brewing, which celebrates its 25th anniversary in 2019.

● 4: Percent added to the room tax in 1983 by the state, which mandated that all revenue go back to the promotion of tourism in Asheville and surrounding Buncombe County.

● $105 million: Amount that GE Aviation, one of several companies that are betting big on the city, announced it was putting into its local expansion..

HIGHLAND BREWING COMPANY
In its 40-acre space, the city's original craft brewery has a rooftop deck with views of the Blue Ridge Mountains and solid beers including Midnight Summit, a vanilla milk stout.

EARLY GIRL EATERY
Everything is made from scratch at this all-day breakfast staple on Asheville's Wall Street. A second location is on the way in hip West Asheville. The Early Girl eggs Benedict with fried green tomatoes, local country ham, and herbed fromage blanc is deservedly famous.

ASHEVILLE TEA COMPANY
Calling her offerings the city's "other craft brew," owner Jessie Dean showcases tea cooking classes and unique blends at her new pop-up shop in West Asheville.

FRENCH BROAD CHOCOLATES
Known for bean-to-bar creations and superb drinking chocolates, this factory has a new cafe and creamery.

Richmond

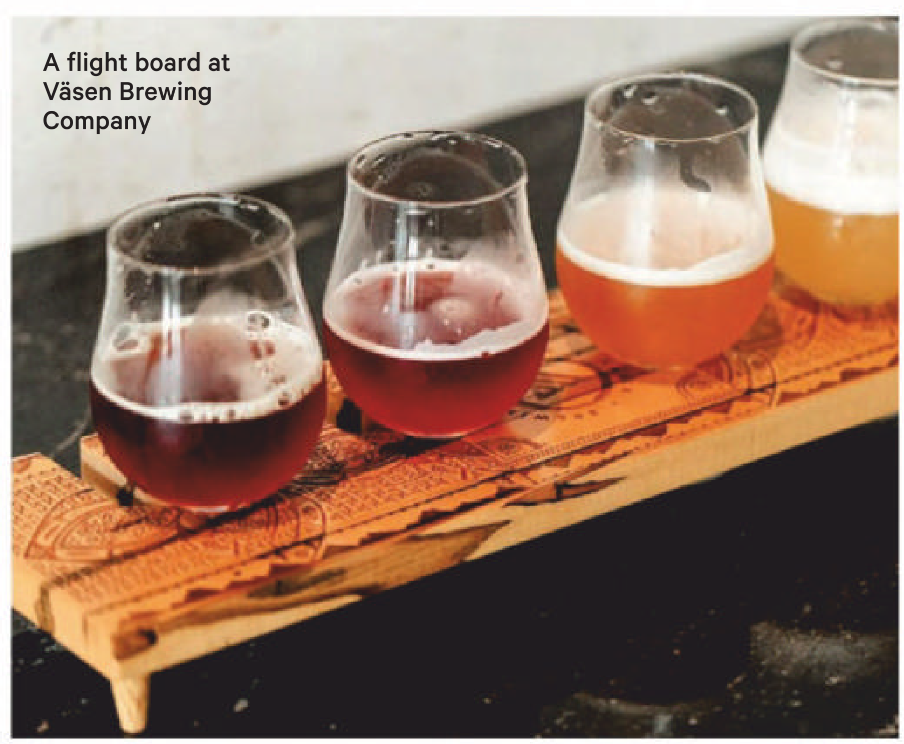
The buzz outside of D.C. is all about butchers and brews

Coming home to Richmond wasn't an easy choice in 2012, says Brittanny Anderson. But the James Beard-nominated chef, who trained at Blue Hill at Stone Barns in New York's Hudson Valley, now has two restaurants: Metzger Bar & Butchery and Brenner Pass. It's called the "boomerang"—in which young entrepreneurs move home after cooking elsewhere—and one of the hallmarks of the food scene here. Less than three hours from Washington, the Virginia capital has a low cost of living and top-tier universities as additional draws. Patrick Phelan, co-chef and co-owner of tasting menu joint Longoven, says he found it prohibitively expensive to open a restaurant in bigger markets, so he boomeranged back. "I was hungry to get to an environment where I knew my neighbors," he says.

● 1: Rank of Richmond in the nation for breweries per capita in 2016. It was sixth for restaurants per capita.

● $915 million: Amount that tourism generated in 2017 in Richmond's Henrico County, according to the Virginia Tourism Corp. Overall, visitor spending in the county increased 4.1 percent over the year before.

● $1,034: Amount tourists visiting for the local craft beer scene spend on average on a trip to Virginia. Food tourists spend an average of $986 per trip.



A flight board at Väsen Brewing Company

LONGOVEN
A dinner series pop-up transformed into a tasting menu destination by three friends. Dishes include cauliflower with oyster cream and roasted pheasant.

BRENNER PASS
A rare take on the cuisine of the Alps, including mortadella schnitzel sandwiches.

VASEN BREWING COMPANY
The Scott's Addition neighborhood staple prides itself on sustainable beers.

ZZQ
Authentic barbecue by Texas transplant Chris Fultz and Alex Graf gets a brick-and-mortar home after years as a food truck.

ALEWIFE
Lee Gregory's first solo project takes on sustainable Chesapeake Bay seafood.

ASHEVILLE: EMILY CHAPLIN/COURTESY EXPLORE ASHEVILLE. VASEN: NICK DAVIS PHOTOGRAPHY

Hair

PROSE SHAMPOO
Co-founded by a former L'Oréal SA executive, Arnaud Plas, this hair-care brand uses CBD "for a healthy scalp." But it's probably licorice root and moisturizing B-5 that's really livening up your locks. *From $25; prose.com*

Eyes

KUSH HIGH-VOLUME MASCARA
$24; milkmakeup.com

Mouth

LORD JONES GUMDROPS
TOP PICK
Known for its beautiful packaging, the well-researched Lord Jones brand has been at the vanguard of what Chief Executive Officer Robert Rosenheck calls "a health and wellness revolution." These delicious, all-natural gumdrops contain 20 milligrams of CBD per piece to act as a mood stabilizer. *$45; lordjones.com*

Lips

VERTLY LIP BUTTER
With only 25mg of CBD in the container, you're not getting much of it. But it's a nice lip balm anyway. *$22; shop-whitelabel.com*

Tongue

LILY CBD
TOP PICK
Many experts agree that the most effective way to take CBD is to squirt the oil under your tongue with a dropper. Russell Markus's company consulted with doctors to arrive at his 16mg dosage. *$99 for 500mg bottle; lilycbd.com*

Face

HERB ESSNTLS MOISTURIZER
$60 for 2 oz.; herbessntls.com

Underarm

SACRED BIOLOGY DEODORANT
$20; bloomble.com

Stomach

RECESS SODA
$30 for six-pack; takearecess.com

Intimate areas

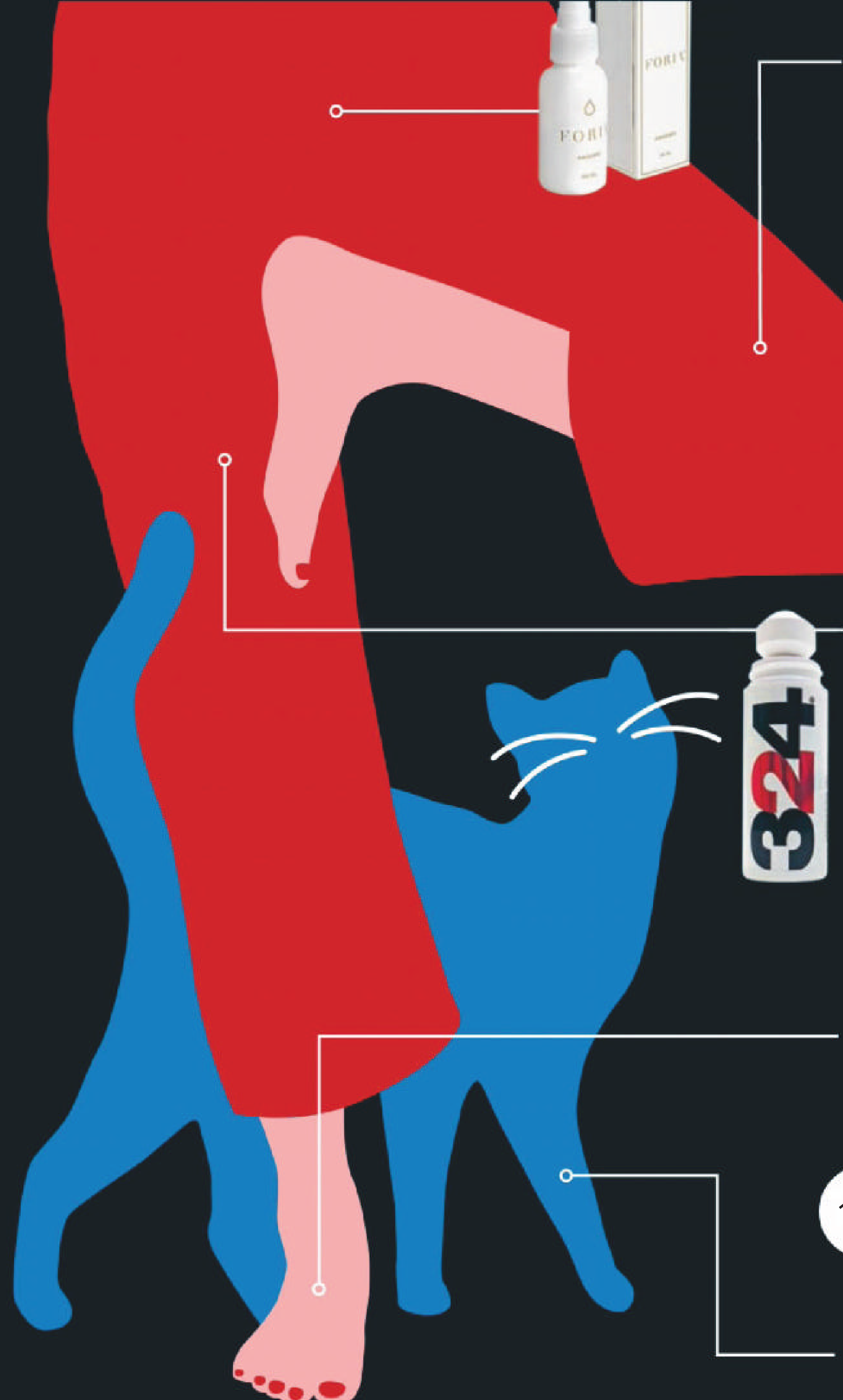
FORIA AWAKEN
TOP PICK
This "therapeutic aphrodisiac" is meant for women. Apply to your fingers and gently massage. Full effects can take 15 minutes. *$48; foriawellness.com*

Body

CBD From Your Head To Your Feet

The latest craze in wellness aims to relieve wherever ails you. *By James Gaddy*

No, CBD doesn't get you high. But it's made from the cannabis plant–the letters stand for "cannabidiol"–and, as such, is subject to the same laws as marijuana in the U.S. It got a major boost when the December 2018 farm bill legalized the production of marijuana's nonpsychoactive sister–hemp–and interstate transfer of hemp-derived goods, opening the floodgates for a legal CBD market that could surpass $20 billion by 2022, according to researcher Brightfield Group LLC. As legalization has spread, so has CBD's fame. Depending on which marketing materials you read, it can provide relief for just about every malady known to modern humans: anxiety, chronic back pain, menstrual cramps, postworkout muscle soreness, dandruff, even chapped lips. Lack of regulation, however, gives some of these products the feeling of a late-night infomercial for oregano cleanses. "Seventy percent of products don't have what's written on the label," says Davey Napoli, one of three co-founders of White Label, a site that sells CBD products after diligent research. Jon Brandon, co-founder of Foria Wellness, a brand that uses CBD for better intimacy, remains optimistic. "There is much to be excited about," he says, "and much research to be done." We tested some of the most popular–and strangest–applications so far.



WILDFLOWER SOAP
This all-natural cleanser with 20mg of CBD lathers into a rich and soothing foam. *$30 for pack of three; buywildflower.com*

MIRAI BATH BOMB
$9; miraiclinical.com

PLANT PEOPLE PLANT BALM
$49 for 400mg; plantpeople.co

Muscles

324 ROLL-ON
The brand's name comes from where each letter falls in the alphabet—3 for "C," 2 for "B," 4 for "D"—but the story is no gimmick: Founder Pascal Pakter is a former Brazilian jiujitsu fighter who, after injuring two vertebrae, became an evangelist for the pain-relieving powers of cannabis. This roll-on, which includes camphor and menthol, will take the place of your tube of Icy Hot. *$35; higherstandards.com*

Feet

TOP PICK

MARY'S NUTRITIONALS ELITE TRANSDERMAL PATCH
One of the most popular brands for CBD, Denver-based Mary's Medicinals offers a 2-inch square patch that contains 10mg of hemp extract, which it gradually releases into the bloodstream. *From $10; marysmedicinals.com*

Pets

SOFT CHEWS FOR CATS
$32; treatibles.com

COURTESY OF VENDORS; ILLUSTRATION BY JACI KESSLER LUBLINER

A Case of the Black Mondays

Showtime's comedy mines the markets for middling laughs

By Joe Weisenthal

Whenever unexpected volatility strikes the market, as it did last December, some investors and pundits blame "the algos" or "the quants" or "the computers" for creating extreme conditions. These claims are never really that satisfying, though, and often end up sounding like a faux sophisticated way of saying, "I have no idea why stocks are tanking so much, so I'm going to say something that can't easily be disproven and makes me sound as if I have a deep understanding of market structure."

Arguably the earliest example of this phenomenon occurred shortly after Oct. 19, 1987—otherwise known as Black Monday—when stocks around the world cratered and the Dow Jones collapsed by a record 22 percent. To put that into context, the next worst plunge was 13 percent, and that was during the crash of 1929. In fact, the next three worst days were all in 1929, on the eve of the Great Depression.

One common explanation for the '87 crash was portfolio insurance, which was basically an approach to automate the process of hedging and de-risking a portfolio. Thus, the theory goes, as more stocks fell, automated selling created a downward spiral. Despite the appeal of this theory, it's far from proven and contains many holes.

So that's the context for *Black Monday*, a comedy series on Showtime, which is set sometime before that day and offers a fictional backstory for what really caused the crash. The plot centers around Mo Monroe (played by Don Cheadle), the founder of a fast-growing, hyperaggressive trading firm. As with most fictional Wall Street companies, it's a little hard to figure out exactly what this one does: part financial advisory, part prop trading shop, part boiler room, and part corporate raider. What's more clear is the general depiction of the firm as a band of misfit outsiders, eager to break in and do damage to the old boys' club that's traditionally dominated finance. The strongest emblem of this is Monroe himself, who is black.

Because it's the '80s, and because it's a comedy, the show offers a cartoonish depiction of everyone's behavior: endless vulgar jokes (there's a long scene in which prostitutes are referred to as "'tutes"), copious cocaine use (even off a toy gun), and so on. To be honest, all this gets old pretty fast.

The network released only the first three episodes to critics, so it's hard to know at this point how Monroe's company will end up being the source of the Black Monday crash. There are some hints, though. The firm has borrowed a lot of money in a dubious attempt to buy a blue jeans company and sell off its real estate holdings. It's also hired a naive, cornfed algo trader named Blair Pfaff (Andrew Rannells), who happens to be engaged to a member of the family that owns the jeans company.

My guess is Pfaff's proprietary algorithmic trading system will somehow intersect with the firm's need to make some huge trade involving this deal, and that will crash the entire market around the world. I don't know for sure. It's just a guess.

I also can't promise that I'm going to stick around and watch the entire show to figure out precisely how the plot works. The characters are all caricatures, and the endless '80s jokes (filled with pop-culture references, such as Michael Jackson's supposed predilection for young children) make the dialogue kind of boring. There's a whole genre of Wall Street fiction in which people doing bad things are glamorized (*Wall Street*, *The Wolf of Wall Street*, *Boiler Room*, etc.), but the life and work of the characters in *Black Monday* don't really look that attractive. In the third episode, there's a tedious subplot about one of the brokers desperately trying to get a Nintendo for his son's bar mitzvah the next day.

There are some redeeming glimmers. Cheadle is great in anything he does, and at one point he whispers to Rannells: "Pro tip, kid: Computers don't make trades; men do." It's a great line, and true. It could've been iconic if it were in a better production. If nothing else, I plan on saying that the next time I hear someone blame the robots for the market having a down day. Ⓑ

ILLUSTRATION BY BRANDON CELI

A Round Sound?

With a circular design, the Beosound Edge brings your speaker in from the corners. *Photograph by Will Anderson*

Bang & Olufsen A/S, the 94-year-old Danish electronics company, has earned a reputation for audio devices with minimalist design and maximalist sound. The Beosound Edge speaker ($3,500) continues in that tradition. Looking like a large snare drum turned on its side, the 20-inch-tall unit offers 800 watts of amplification divided between a 10-inch woofer, a pair of 4-inch midrange drivers, a pair of ¾-inch tweeters, and a hidden port in the front that can open to boost bass levels. You select tracks and volume, either through the streaming platform of your choice or by rolling the speaker a few degrees to the left or right.

THE COMPETITION

• Harman Kardon's 45-inch-tall Citation Tower speakers ($2,500) may remind film buffs of the movie *Tron*. With Google Assistant and 5.1 surround sound built in, ask it to play the movie to see the resemblance for yourself.

• Panasonic's $800 Technics Ottava S has a football-shaped design, but behind its curved face are seven speakers, as well as an inbuilt sensor that can optimize amplification to any room.

• British company KEF makes speakers that reproduce sounds across the broadest possible spectrum. Its new compact wireless LSX speaker series ($1,100) is available in black, white, red, green, and blue.

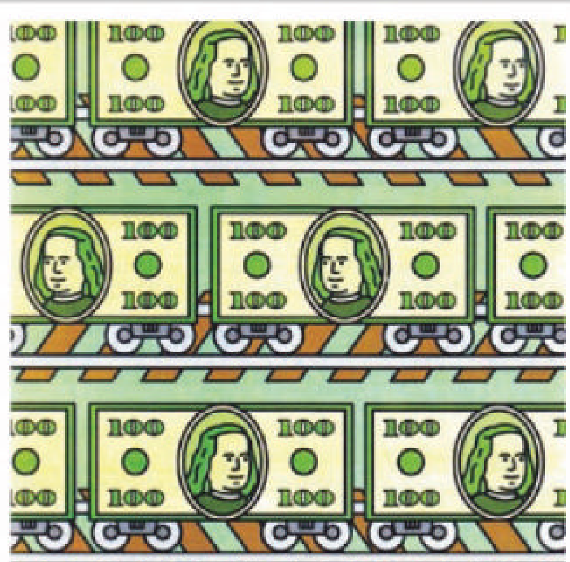
THE CASE

The Edge has speakers on both faces of the "drum," so it sounds great wherever you place it in a room. While rolling the speaker to control the volume is novel (it sits on an almost invisible base, so it can't roll away), it's easy to overshoot the mark and also to leave fingerprints. Control is better left to AirPlay, Chromecast, or even Bang & Olufsen's Beoplay app, which includes ToneTouch, an intuitive visual approach to sound equalization. *$3,500; bang-olufsen.com*

A Railroad Legend's Vision Lives On

By Brooke Sutherland

Hunter Harrison, a legend of the modern railroad industry, spent some of the final years of his life trying to boost the industry's efficiency and reliability with one last megamerger. He failed, but today his vision for streamlining train operations is being vindicated—without megamergers.



As chief executive officer of Canadian Pacific Railway Ltd., Harrison approached CSX Corp. in 2014 about a possible takeover, but the deal never got off the ground. A year later he was back at it, beginning a hostile pursuit of CSX's East Coast rival Norfolk Southern Corp. That fell apart five months later.

The mergers didn't happen for many reasons, the biggest being that regulators didn't want them to. Warren Buffett's Berkshire Hathaway Inc. acquired Burlington Northern Santa Fe Corp. for $36 billion in 2010, but there hasn't been a major deal between two top North American railroads since the late 1990s. That was when Norfolk Southern and CSX split up Conrail Inc.'s assets and Canadian National Railway Co. acquired Illinois Central Corp.

In Harrison's bid for Norfolk Southern, Canadian Pacific proposed to mitigate antitrust risk by temporarily housing its assets in a voting trust. Theoretically, this would have kept the two companies independent but would have allowed Norfolk Southern shareholders to get their payout before the takeover had been officially approved. Regulators took a dim view of the idea, and Harrison ended his quest after officials at the U.S. Army and the Department of Justice voiced opposition to the plan.

Among investors, questions lingered about whether Harrison would have been able to improve profits at CSX and Norfolk Southern to the extent he had at Canadian Pacific and Canadian National before that. He was known for his precision-scheduled railroading strategy, which was designed to reduce the number of people and cars and the amount of capital needed to run train operations. Critics said that operating ethos wouldn't work as well at CSX or Norfolk Southern, whose circuitous routes cut across more difficult terrain.

They were wrong. In 2017 activist investor Mantle Ridge LP recruited Harrison to become CEO of CSX. The storied cost-cutter pushed too hard, too fast at CSX, earning the ire of customers, employees, and regulators. He died at 73 after less than a year in the job, and a protégé, James Foote, took over. To investors' surprise, Foote has smoothed over the speed bumps created during Harrison's tenure, and CSX has seen a dramatic improvement in profitability.

His success has prompted former naysayers at Norfolk Southern and Union Pacific Corp. to adopt Harrison's blueprint, and it's made his other former lieutenants a hot commodity. Jim Vena, who worked with him at Canadian National, is joining Union Pacific as its chief operating officer. The January announcement gave the railroad an almost $9 billion pop in its market value in one day. Deal or no deal, the industry is remaking itself in Harrison's image. B

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