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Bloomberg Businessweek
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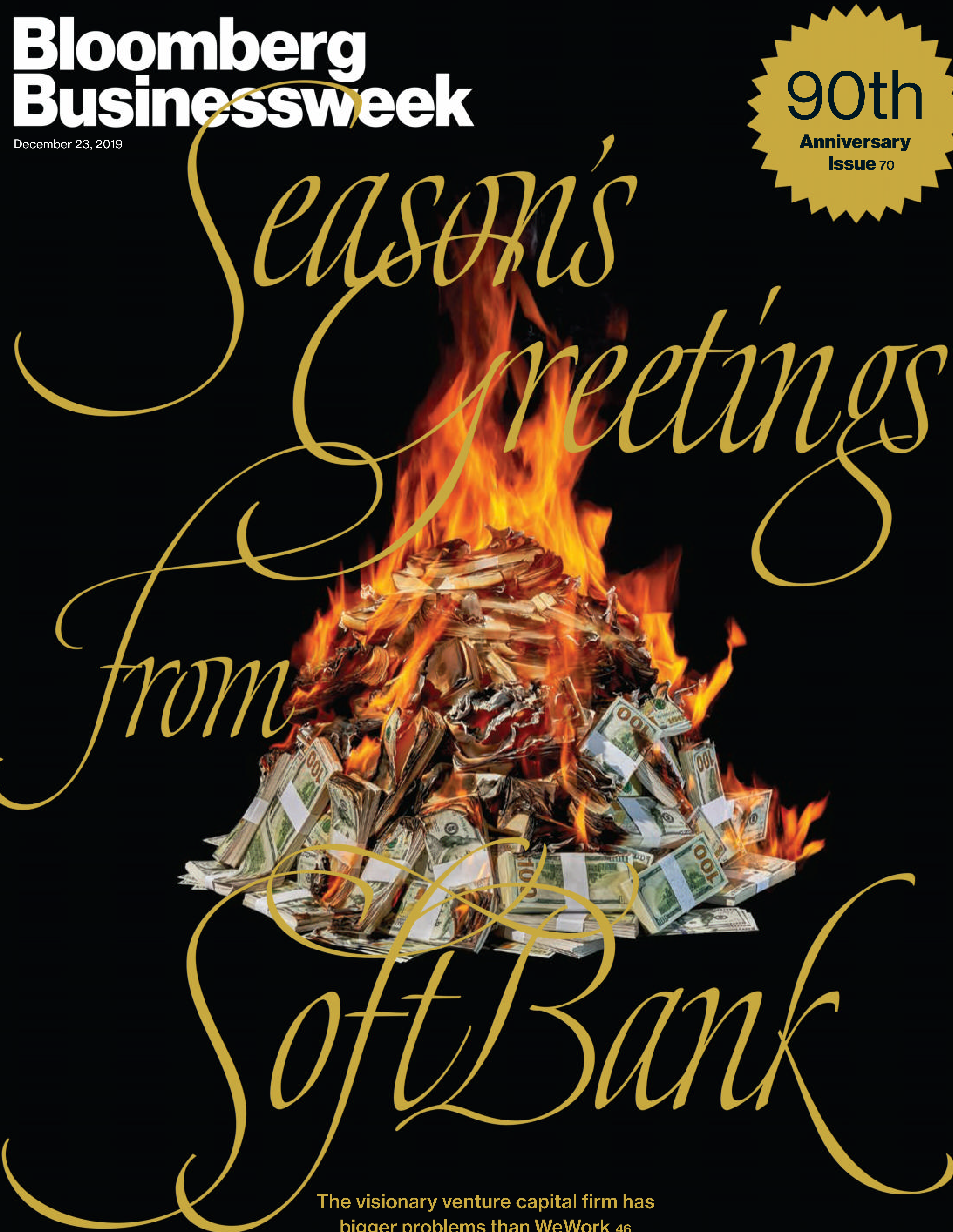


The visionary venture capital firm has bigger problems than WeWork 46

Broader Perspectives:

ART AS A TOOL FOR UNDERSTANDING

Technology is changing the way we live. It brings us together in ways never before possible, yet one of our greatest challenges is that we often feel untouched by the problems and issues affecting those around us. As new technologies continue to shape our world, art can help us use them to prepare for the future.

Hyundai Motor Company has taken that to heart. Guided by a firm belief that art enables people to expand their minds and transform their perspectives, the company consistently goes beyond the pursuit of profit to support cultural and arts programs around the world. The goal: foster the development of the global art scene and contribute to a sustainable and diverse cultural environment, delivering inspiration and unique experiences to a wider audience.

The result of Hyundai's efforts is a comprehensive arts program. It started with long-term partnerships with some of the world's most distinguished cultural institutions including Tate Modern and the Los Angeles County Museum of Art (LACMA). Today, it includes inspiring exhibitions in the company's brand experience spaces called Hyundai Motorstudio.

WHY ART + TECH?

Exploring the convergence of art and technology is central to Hyundai's focus on

'Internet of Everything: All Connections' (2018) by Shaun Hu (China). Image by Hyundai Motorstudio

'Black Sea' (2019) by Refik Anadol (Turkey). Image by Hyundai Motorstudio

the arts. Its Art+Tech exhibition programs are held at Hyundai Motorstudio and create a space for people to discuss how technology will shape our future.

The latest exhibition, *Human (un)limited*, celebrates the essence of humanity and its nature of overcoming human limitations through technology by envisioning a future where humans and new technology co-exist. The exhibition was initiated by Hyundai and curated in collaboration with ARS Electronica, an Austrian institution that specializes in media art.

Launched in November and running through February 2020, *Human (un)limited* will be displayed at Hyundai Motorstudios in Beijing, Seoul and Moscow. It includes approximately 20 compositions of sculpture, interactive installations and media art by 18 international artists. In all of the works, the artists used technologies from the Fourth Industrial Revolution, including Artificial Intelligence, 3D printing, robotics and biotechnology.

"As implied in our vision, 'Progress for Humanity,' Hyundai Motor Company celebrates humanity through art and believes that this understanding is strongly reflected in our products," said Wonhong Cho, Chief Marketing Officer and Executive Vice President at Hyundai Motor. "Rather than serving as a simple automotive brand, Hyundai Motor seeks to be a lifestyle choice by providing customers with new cultural experiences that will enrich their lives and make their time more valuable. Hyundai Motorstudios exist to serve these purposes as experience zones that convey Hyundai's exploration on art, design, and many other elements in relation to technology."

Hyundai has been exploring the convergence of art and technology since 2015 when it partnered with LACMA's Art + Technology Lab. The initiative supports artists' experiments with emerging technology. The current exhibition by Kirsten Mosher, *Soul Mate 180°*, uses satellite imagery, 3D printing and other design and fabrication technologies to explore the tension between what can be seen and what is imagined.

Hyundai is also exploring this topic through the Art + Technology series with Bloomberg Media. Now in its second season, the project profiles institutions and artists who are working across a broad range of subgenres like projection mapping, robotics, virtual reality and others. The project reflects Hyundai's desire to foster innovative thinking through technology and its commitment to making the arts accessible to everyone.

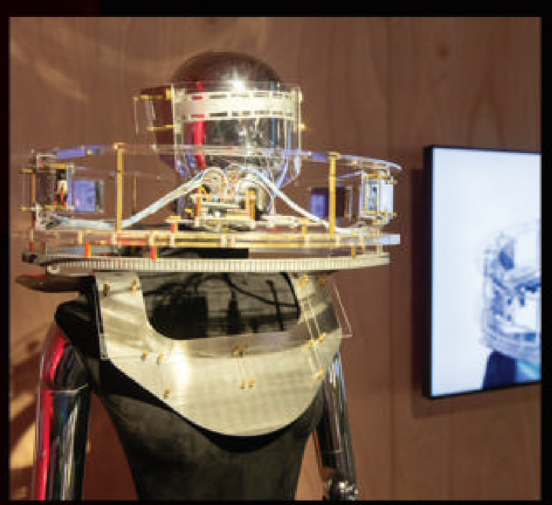
ART AS INSPIRATION FOR THE FUTURE OF MOBILITY

If knowledge is power and art is understanding, the value of bringing them together holds tremendous potential. That's exactly why Hyundai remains committed to the arts. The benefits that it delivers to people around the world align perfectly with the company's brand ethos. More importantly, the understanding that Hyundai gains in the process helps it to ask and answer the right questions for society.

The essence of art and spirit of innovation are the foundations of the company's Strategy 2025 roadmap. Under the new roadmap, it will foster Smart Mobility Device and Smart Mobility Service as two core business pillars. Together, they will facilitate Hyundai's transition to a Smart Mobility Solution Provider with new products such as Personal Air Vehicles, robotics and last-mile mobility – all of which incorporate inspiration from the various creative projects it supports.

"All companies that engage with technology are preparing for a future that is fast changing, hard to predict and drastically changing people's lives," said Cho. "Art offers us new perspectives, inspiration and sparks of curiosity about social phenomena. I consider these qualities to be the medium for creative growth and increased emphasis on innovation within our company."

'Soul Mate 180° (The Other Side is Here)' (2019) by Kirsten Mosher (United States), courtesy of the artist, © Kirsten Mosher, photo © Museum Associates/LACMA



'Post-factory Era' (2019) by Lin Yangfan (China). Image by Hyundai Motorstudio

A scene from Art + Technology series by Bloomberg Media, powered by Hyundai Motor Company

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WE'RE 90! 70

When you've been around as long as we have, you learn you can never say thank you enough. Making a weekly magazine is a team sport, and each issue is a testament to our talented staffers and contributors—generations of them, in fact. We're also deeply appreciative of our many advertisers through the years. Above all, we're grateful to you, our loyal readers. We know you live in a loud, busy, turbulent world filled with incessant distractions. For our part, we strive to provide you with a little sanity amid all the chaos through bold journalism, sharp news coverage, memorable design, and iconic covers. While we want to keep you "near" the news by being timely—connecting dots, providing context—we really aim for something that's almost timeless... which can still feel pretty special, even at 90. Again, on behalf of all of us at *Bloomberg Businessweek*, thank you for giving us the opportunity to serve you for all these years.

Joel Weber
Editor, *Bloomberg Businessweek*

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How the cover gets made

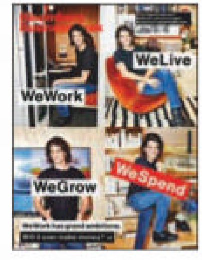
May 2019

"So we've got this story about WeWork. They're spending a ton of money and may not even have a busin—"

"I think we should burn money."

"Ehhh…I mean, I love it, but what if it's, like, a bit too harsh, and they really have something here? I dunno, I'm just—"

"Fiiiineee. Ugh. Whatever, we'll shoot the CEO. But I'll remember this."

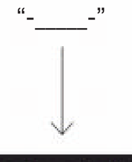


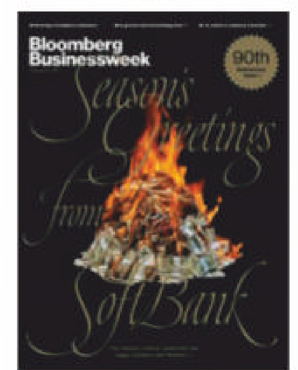
Thirty weeks and a dramatic collapse of WeWork later

December 2019

"So we've got this story about SoftBank, which invested in WeWork—"

"-_____-"





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From employee to entrepreneur
Nisha learned how on YouTube. What will you learn?
"After I got laid off from my job, I didn't have enough money to buy a nice birthday gift for a friend's daughter. Then a light bulb went off. I had a sewing machine, and always had a knack for design—maybe I could make something? I didn't even know how to turn it on, so I pulled up YouTube to learn how to use it. I kept watching videos, over and over, until I finally made my first stitch. I taught myself to make these colorful bows that my friend's daughter could wear in her hair. And the parents went crazy for them. I left that birthday party with six customers.
That's when I started reimagining myself as an entrepreneur and started my company, Knotzland. We now make handmade bow ties from reclaimed fabrics. It's beyond what I dreamed—I'm not only a designer but also a business owner. I gave myself a whole new life. It's been a crazy journey."
Watch Nisha's story: youtube.com/NishaLearnedHow
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■ REMARKS

"So I says to the doc, 'Does this thing look like a ***bubble*** *to you?'"*

● The risky pursuit of returns amid negative rates isn't a laughing matter. Be afraid

● By Peter Coy

Apologies for being churlish in the holiday season, but the let-nothing-ye-dismay attitude of the financial markets has me worried. The exuberance feels irrational. Asset bubbles form, remember, when greed overwhelms fear. It's a truism that bad loans are made in good times when lenders relax their standards. As the American economist Hyman Minsky once put it, stability breeds instability.

Investors get edgy when asset prices are down, but they should be more concerned at times like now, when prices have gone up, up, and up. Through Dec. 17 the S&P 500 index has gained 27% this year. The market feels as frothy as the top of a nutmeg cappuccino.

"We enter the next decade with interest rates at 5,000-year lows, the largest asset bubble in history, a planet that is heating up, and a deflationary profile of debt, disruption, and demographics," Michael Hartnett, chief equity strategist for BofA Global Research, wrote in a recent note.

There's a bigger issue here than whether stock and bond prices are too high. The more serious question is whether

ILLUSTRATION BY SANY

the economies of the U.S. and other wealthy nations can no longer grow without producing destabilizing bubbles–spikes in asset prices unjustified by fundamentals. Or, worse yet, whether the bubbles themselves are crucial to generating economic growth.

The circumstantial evidence for a dysfunctional relationship between economies and bubbles is troubling. The last time the U.S. jobless rate got down to almost as low as it is now was the late 1990s and 2000. That boom was fueled by a mania of investment in telecom infrastructure and dot-com startups that ended abruptly at the turn of the century, when gluts formed and prices got too high. The bubble popped. Growth was rescued by a surge of overinvestment in housing, which was pumped up by stupid or fraudulent subprime mortgage lending. The popping of that bubble led to the worst economic downturn since the Great Depression.

Now the funny-money cycle seems to be happening all over again. Interest rates in Japan and Western Europe have broken below what used to be called–naively, we now realize–the "zero lower bound." Economic historians say this appears to be the first time in the history of the world in which negative interest rates are widespread. Scholars of ancient Mesopotamia are invited to say otherwise.

When rates on safe securities go negative–or ultralow, as they are in the U.S.–investors feel compelled to take on greater risk to get what they consider an acceptable return on their money. They "reach for yield." Default-prone Argentina found buyers in 2017 for a 100-year government bond. Greece's 10-year bonds have found takers at yields of just over 1% a year. In the U.S., investors are snapping up risky "covenant-lite" corporate loans that have been stripped of the protections for lenders that ordinarily discipline the borrowers.

"I am very worried," says Mayra Rodríguez Valladares, managing principal of MRV Associates, a New York-based consulting and training firm for the financial sector. Banks' assertions that they have plenty of capital and liquidity to withstand the next downturn aren't reliable, because "you can't control fear," she says. "When fear takes over, it's hard to stop."

Bubbles are not all bad. Sometimes it takes the prospect of enormous riches to get people to make investments that end up being good for society, even if the investors lose their shirts. That applies to canals and railways in the 19th century, fiber-optic networks in the 1990s, and companies in hot areas such as drones, batteries, solar power, and virtual reality today.

But bubbles also generate waste. The housing bust left hundreds of unsightly and unsafe "zombie subdivisions" across the American West, the Lincoln Institute of Land Policy wrote in a 2014 report, *Arrested Developments*. The poor and working class suffer the most from boom-and-bust cycles, because they're the last hired and first fired and are more likely to invest at the worst time, right before things go bad. It's ironic that at a time of low inflation, there's been rioting in Chile, Colombia, Ecuador, Iran, Hong Kong, Lebanon, and Sudan over, among other issues, the high cost of living. A bubble in real estate is one of the incitements to protest in Hong Kong, which has the world's most expensive housing.

So it's natural to ask why this keeps happening and what, if anything, can be done to take the bubbles out of economic growth. Former Federal Reserve Chairman Ben Bernanke partly explained it in 2005 when he identified a global savings glut: foreign investors, including the Chinese, were pouring money into the U.S. because their savings far exceeded good investment opportunities at home. Some of those foreign savings, alas, were wasted on those arrested housing developments. Lawrence Summers, a former U.S. Treasury secretary and Harvard president, has built on Bernanke's theory with the notion of secular stagnation: a chronic, worldwide lack of spending because of the aging of society and the rise of companies such as Apple, Airbnb, and Google that don't need much physical capital. Summers argues that the economic expansion would ebb if left alone and is being sustained by governments using artificial means: deficit spending and low interest rates.

Minsky, the economist who said stability breeds instability, may have had the most complete diagnosis, even though he died in 1996, before serial bubbles became a thing. Building on the work of others, including the Briton John Maynard Keynes and Michal Kalecki of Poland, Minsky focused on the financial side of the economy–flows of money, not just goods and services.

"Profits," Minsky wrote in 1992, are "the key determinant of system behavior." He said financing tends to degenerate from safe ("hedge"), to risky ("speculative"), to outright irresponsible ("Ponzi"). The Minsky moment–not his term–is the collapse of prices when people abruptly realize that financing has become reckless and unsustainable.

There's a troubling new analysis of where we are today, in the Minsky tradition, called *Bubble or Nothing*. The 64-page report was issued in September by David Levy, chairman of the Jerome Levy Forecasting Center LLC in Mount Kisco, N.Y. Levy is a former associate of Minsky and the third generation of forecasters in his family. A hedge fund he launched in 2004 to bet on falling short-term interest rates gained 500% for investors before closing in March 2009, shortly after rates bottomed.

When investors reach for yield, as they are now, it's because they "see no other way to obtain financial returns that are anywhere near their goals," Levy wrote in *Bubble or Nothing*. Pension fund managers, for example, feel they have to take risks to fulfill promises to retirees. In 1992 public pension plans assumed they would earn a return of 8%, about what they could get on 30-year Treasury bonds. Reasonable. In 2012 they were still assuming they could earn almost 8% a year, according to a study by Pew Charitable Trusts, even though the yield on safe 30-year Treasuries had fallen to 3%. Unreasonable.

The core problem, Levy says, is that household and business balance sheets have gotten too big–top-heavy, you might say. He focuses not only on debt, on the right side of the balance sheet, but also on assets, which appear on the left. ▶

◀ While having lots of debt is obviously precarious, he says, having too much in assets is also problematic for the economy as a whole. It can indicate overinvestment (too many houses in the Phoenix exurbs) or excessively high valuation of whatever assets exist (so prices are unsustainable).

Americans emerged from World War II with little debt because consumption was rationed during the war years. They owned few assets because private investment had been suppressed and valuation of assets was pessimistically low, with a price-earnings ratio in 1949 of less than 6 for the S&P 500 (it's 21 now). But balance sheets grew. In each successive business cycle, the ratio of debt to income grew as lenders competed for market share. By the 1980s it began to be a problem. Ominously, a growing share of the debt went to buy existing assets rather than new ones: It was inflation vs. creation.

With balance sheets getting too big to fail, the Fed came to the rescue in each recession with interest-rate cuts to reduce the carrying cost of all that debt and to prop up the value of rate-sensitive stocks, bonds, and other assets. It worked like a ratchet. Rates fell in each successive cycle because the bigger balance sheets grew, the lower interest rates needed to be, Levy says.

True, households in the U.S. have paid down some of their debt since the 2007-09 financial crisis. But the nonfinancial corporate sector has gotten even deeper into hock. "Corporate America's fragile debt pile has emerged as a key vulnerability," Oxford Economics Ltd. senior economist Lydia Boussour wrote on Oct. 31. Half of investment-grade corporate bonds are in the lowest tier by credit rating, vs. 37% in 2011. And 80% of leveraged loans are covenant-lite, vs. 30% during the financial crisis, she wrote.

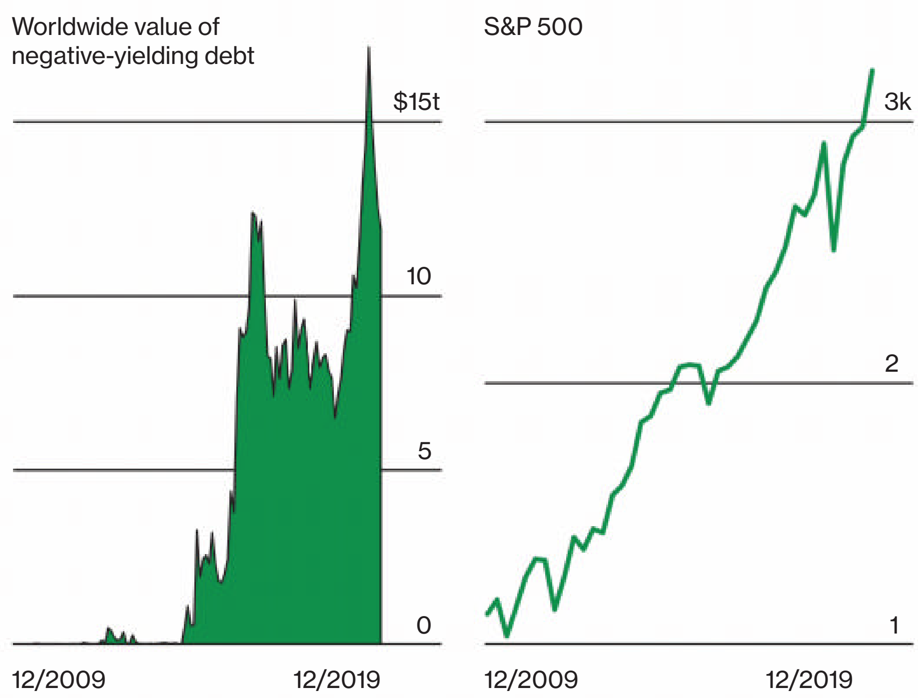
Unfortunately for the would-be rescuers—or enablers—at the world's central banks, interest rates are about as low as they can possibly get in Western Europe and Japan. (The Fed still has a little room.) The banking system begins to break down at negative rates because depositors, who supply banks with funds, refuse to lose money by leaving it in the banks. At some point they're better off keeping it under the mattress. "We are very aware of the side effects" of negative rates, European Central Bank President Christine Lagarde said after her first board meeting on Dec. 12.

Lagarde has a bigger problem than does Fed Chair Jerome Powell. She's up against ratios of private nonfinancial-sector debt to gross domestic product above that of the U.S. The ratios in Australia, Canada, China, and South Korea are, in fact, higher than the ratio was in the U.S. at its 2009 peak, according to the Bank for International Settlements. That's why Levy predicts the next crisis will begin abroad. "It may not be as bad for the United States as in 2008-2009; it is likely to be worse for most of the rest of the world," he wrote.

The fix seems simple enough: De-risk balance sheets by allowing the air to come out of asset prices and paying off debts. "The best is to grow out of it gradually and consistently, and it's the solution to many but not all episodes of current indebtedness," says Mohamed El-Erian, chief economic

Are Negative Interest Rates Pumping Up Bubbles?

As rates fell below zero in Europe and Japan, U.S. stock markets soared



adviser to the German insurer Allianz SE and a Bloomberg Opinion columnist.

But as Keynes taught, what works for a single household doesn't work for the economy as a whole. One person's savings deprives someone else of income. The business profits that Minsky pegged as the key determinant of system behavior depend on constantly increasing investment in houses, factories, software, etc. And those investments are largely financed with debt.

The only way businesses could make a profit at a time of deleveraging would be if governments took up the slack with massive public spending, as they did in World War II. But even that wouldn't work if it bolstered the private sector's confidence and led households and businesses to releverage. The war was a special case. In the U.S., wrote Levy, "that situation included grave household and business fears, great uncertainty, government quotas, outright bans on some kinds of spending, a powerful social force for the population to comply with the government's programs, massive government deficit spending equal to a quarter of GDP, and hyperdrive economic growth."

Levy concluded that the inevitable correction to balance sheets, whenever it comes, will produce "serious financial turbulence, systemic credit problems, and generally unsatisfying economic conditions." He wrote that "by far the trickiest priority" for the government is to rescue the economy without inducing new risk-taking by the private sector, which would generate the problem all over again. A "benign transition," he wrote, is "next to impossible."

Given the ugly alternatives, governments are keeping the game going through stimulative fiscal and monetary policy. But for how long? The late economist Rudiger Dornbusch once said, "In economics, things take longer to happen than you think they will, and then they happen faster than you thought they could." Ⓑ —*With Enda Curran*

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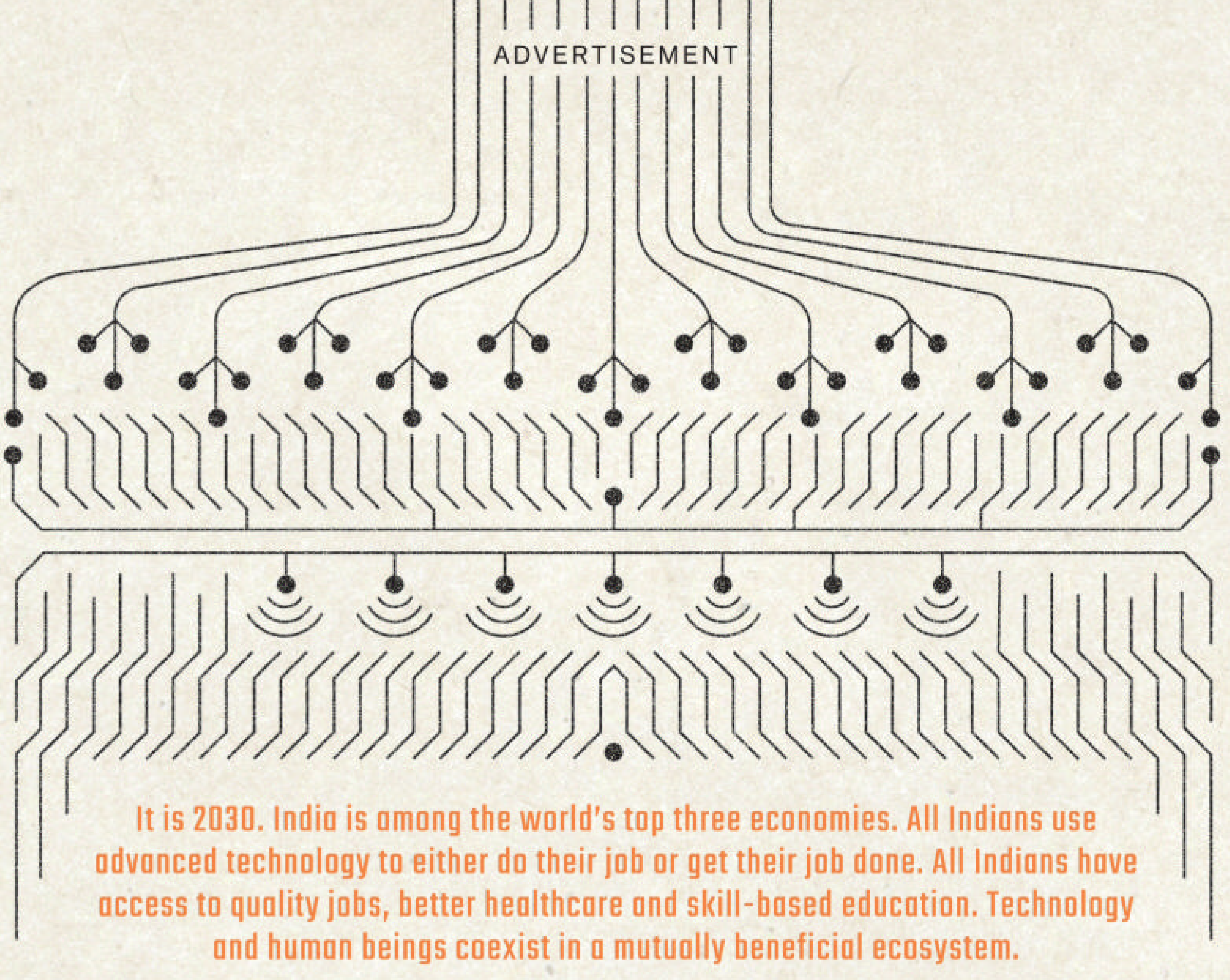

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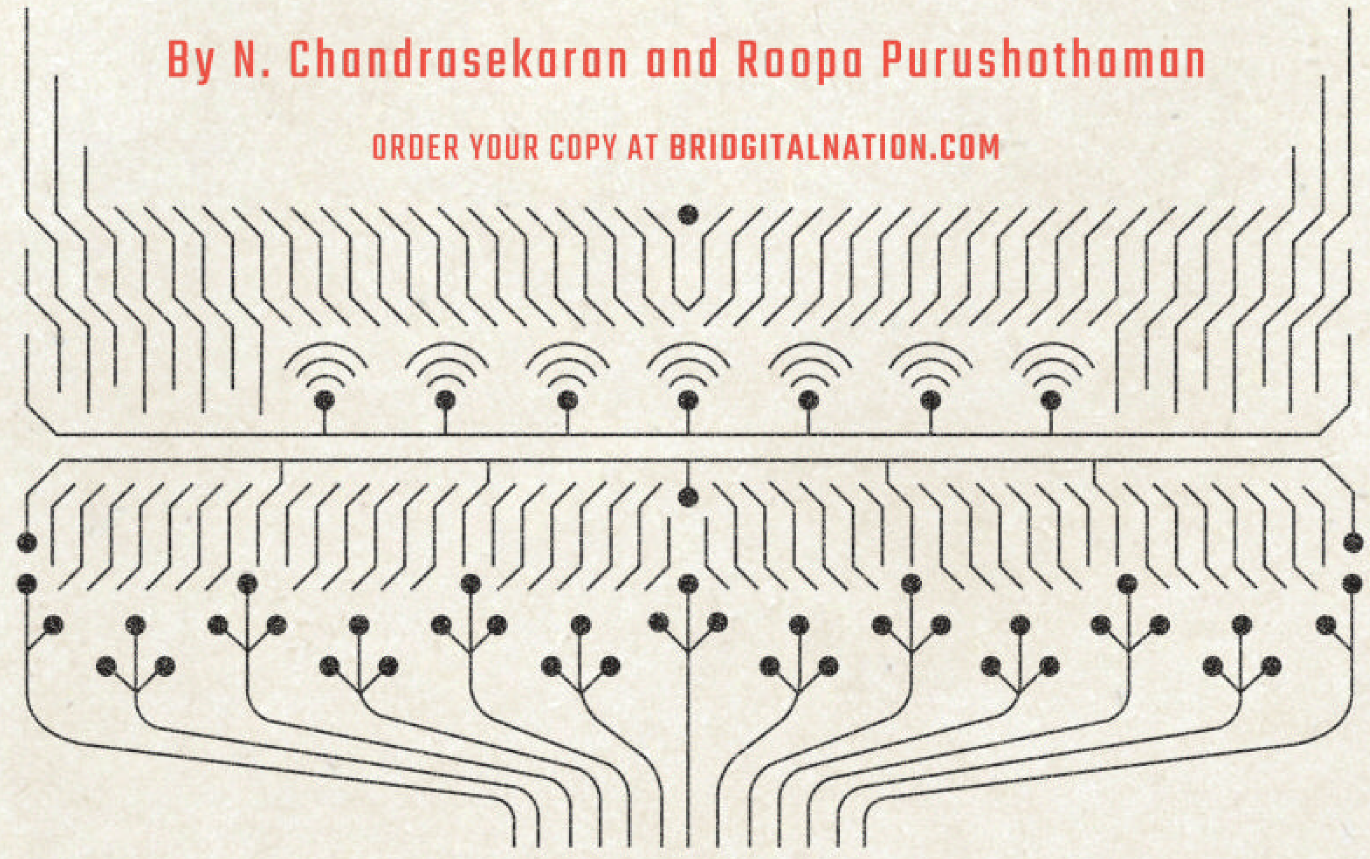


'Bridgital Nation offers a penetrating look at today's India, and suggests a novel approach for reimagining automation'

SATYA NADELLA

A Smart Life

China advances the development of intelligent cities

By Li Jing

As night falls on Xiongan New Area, about 100 km southwest of Beijing in Hebei Province, something unique happens: Streetlights come on and automatically adjust their brightness according to the number of pedestrians and vehicles around them. Passersby sit casually on the benches beside the streetlights, where they can charge their phones on the poles' outlets and access a free Wi-Fi network. The streetlights are also equipped with multifunction cameras, enabling them to automatically collect and transmit traffic information.

Since the first intelligent streetlights were installed on August 26 in Xiongan, what looks like a scene from a futuristic sci-fi movie is now part of local residents' day-to-day reality.

"The smart devices and 5G stations use a 48-volt direct current, which is absolutely safe for humans, even in case of contact. This helps prevent any risk of electric shock during the rainy season," explained Guo Tianhong, a technician at the China State Grid branch in Xiongan.

The new area, officially established on April 1, 2017, is an initiative to encourage the coordinated development of the Beijing-Tianjin-Hebei region. Among many tasks during the construction of Xiongan, the most important goal was to build a green and smart city.

Xiongan New Area has since established itself as a model for other smart cities being planned and built in China. However, this is not China's first attempt at creating a smart city, and, in fact, the country has been moving along this path for many years.

Long-term exploration

The concept of a smart city was first put forward by U.S. information technology giant IBM in 2008. However, as technology is constantly evolving, the definition of this concept has changed dramatically over the past 10 years. Moreover, as countries have different understandings of the concept and its development priorities, there is currently no single definition of what constitutes a smart city. According to the China Wisdom Engineering Association, in simple terms, a smart city aims to increase the efficiency of city resources; improve urban governance and programs; and provide practical and efficient urban services to citizens through digital and computerized management.

In order to promote a standardized approach to the construction of smart cities, the Chinese government has formulated a series of plans and measures, and has set up several research centers and launched pilot projects throughout the country. Since January 2013, the Ministry of Housing and Urban-Rural Development has announced the creation of 290 pilot smart cities, districts, counties and towns in three successive batches. In addition, several local governments have included smart city projects in their development schedules for the 13th Five-Year Plan (2016–20) period. By early 2018, more than 500 Chinese cities were planning to build or were in the process of building a smart city.

In addition to the central and local governments, businesses play a critical role in building China's smart cities. According to Huang Qian, a professor at the College of Economics at Nankai University, the government should focus on formulating plans, improving industrial policies and creating an innovative environment, while companies should actively take part in the actual physical construction of smart cities.

Many companies are creating innovative urban solutions. Maintaining underground pipeline networks is a major headache for modern cities; excavation work on roads is not only labor- and resource-intensive, it also exacerbates public transit problems by blocking roads. To solve this challenge, Wuhan HopeTop Technology developed specialized robots, leveraging recent breakthroughs in Internet of Things (IoT) technology and artificial intelligence (AI).

"As soon as a problem is detected, such as a water leak, robots are inserted into the pipe, from where they will transmit data and images back to the control center. By analyzing this information with the help of Big Data technology, we can swiftly identify where the leakage point is located," Hu Zhen, HopeTop General Manager, told *Beijing Review*.

In addition to increasing efficiency, these new robots can help solve the problem of water waste. According to Hu, before tap water reaches urban households and commercial enterprises, a significant amount is lost due to numerous cracks in the pipelines. The rate of water waste can reach 30%, which means that 30 tons are lost for every 100 tons of water going through the system. This is a major chal-

XINHUA

A smart bus on display at the China Smart City and Intelligent Economy Expo in Ningbo, Zhejiang Province, on September 6.

XINHUA

An exhibition of the City Brain municipal management platform jointly launched by the government of Hangzhou, in Zhejiang Province, east China, and Alibaba Group on September 19 during Alibaba Cloud's Computing Conference 2018.

lenge on a global scale, but today, with the help of IoT technology and AI, even the smallest cracks can be quickly identified and repaired.

"For the long-term development of smart cities, the government must play the role of a general organizer, responsible for planning and promoting projects," said Feng Kui, a researcher at the China Center for Urban Development under the National Development and Reform Commission. "Governments, businesses and citizens each have their own part to play when it comes to the construction of a smart city, and the three must support each other."

In recent years, a number of organizations and events related to the construction of smart cities—such as think tanks, forums, exhibitions and even competitions—have been launched. These are all platforms for experts, government officials and entrepreneurs to exchange ideas and explore the meaning of a smart city. Together, they can seek better solutions to the numerous issues they typically encounter in the building process. For example, during the 2019 World Internet of Things Exposition in Wuxi, in Jiangsu Province in east China, solutions related to smart cities were put forward in several areas, including energy, healthcare and urban management.

No one-size-fits-all

"As we build smart cities, large, small and medium-size cities must adopt different approaches because the problems they face are different," said Guo Renzhong, Dean of the Research Institute for Smart Cities, Shenzhen University, at the First Digital China Summit in April 2018.

With urbanization accelerating, many large cities are facing different types of urban maladies in several areas, such as urban governance, transport, the environment, public security and healthcare. For these large cities, the construction of smart city infrastructure must aim to provide effective solutions to these problems.

"Each city must find its own path forward according to its own conditions," said Hu.

The City Brain Project, developed by the Hangzhou Municipal Government and Chinese e-commerce giant Alibaba Group, has become a smart assistant to traffic police in Hangzhou, Zhejiang Province in east China. Powered by AI technology, City Brain analyzes road conditions using real-time video feeds and adjusts the duration of traffic lights according to traffic flow. The system can also provide advice to the police in case of emergency.

In 2019, the Smart Approval System was introduced in Haidian District, Beijing, and thanks to this addition, most administrative approvals can be completed online. Registering a company name, for example, now takes only 20 minutes, compared to two business days in the past.

One of the 10 largest ports in the world, the Port of Qingdao, in Shandong Province in east China, opened Asia's first fully automated container terminal in May 2017. Two years later, Qingdao Port successfully carried out the automatic operation of a container crane via a 5G connection. According to Li Fengli, General Manager of the Qingdao Port Group, the facility's cranes can now handle up to 36 containers per hour—50% more than in similar terminals around the world.

The road ahead

China and many other countries are firmly committed to building and developing smart cities. To do so, they will have to meet many challenges.

First, they will have to find stable and reliable sources of funding. In order to provide the huge investment needed to build a smart city, relying solely on government funding is not a sustainable long-term solution. According to Wang Shouqing, a professor at Tsinghua University's Center for Public-Private Partnership (PPP), the PPP model provides an effective solution for the government to expand its financing sources, while giving companies an opportunity to take part in the construction of smart cities.

Data integration and security are other major challenges to be tackled in the process of building smart cities. "Data is the basic foundation for an intelligent city," Guo said. Data is handled by the government along with private companies, such as e-commerce firms and communication network operators, and Guo added that many questions remain around issues of data ownership and security. He said laws must be introduced to ensure data security and fair use to better contribute to building smart cities.

Today, although China has made several breakthroughs in smart city construction, there is still a long way to go. "The development of a smart city is like raising a child. As the child grows older, he or she constantly needs new clothes. The same applies to urban construction. We must never stop making new plans as the situations change," explained Guo. ■

Comments to yanwei@bjreview.com

Where the 737 Went Off

● Changes to Boeing's training regimen may have left pilots unprepared to handle the jet's flawed controls

On an overcast Friday in January 2016, thousands of employees gathered outside the 737 jetliner factory in a Seattle suburb for the first flight of the Max, the newest version of Boeing Co.'s 50-year-old workhorse. Thousands more watched a live feed at their desks. Two of Boeing's ace test pilots sat at the controls, one an ex-U.S. Air Force fighter jock, the other a Navy veteran who'd also flown experimental planes for NASA. As the pilots fired up the first engine, the hulking plane rolled forward several feet—they'd forgotten to set the parking brake.

Inside the fraternity of Boeing pilots, it was an eyebrow-raising moment that later, after the uneventful flight landed to cheers, led to some teasing of the crack duo, Ed Wilson and Craig Bomben, for missing one of the steps in the preflight checklist.

More than an ironic footnote in the Max saga, the incident is a window into the prideful culture that led to two crashes and 346 deaths, a worldwide grounding of Boeing's marquee jet, and unprecedented scrutiny of the storied planemaker's processes. Aviation authorities have weighed in on how Boeing engineers failed to anticipate pilots' reactions to a cacophony of alerts from misfiring flight control software, how managers pressured engineers to speed the completion of their designs, and how an acquiescent Federal Aviation Administration missed the deadly risk from software changes made late in testing.

But the most fundamental breakdown at Boeing may have been a lack of appreciation of how humans respond under stress—both in the machine it was designing and in its own organization. On aircraft like the Boeing 777, a cadre of pilots had worked closely with engineers to solve problems. By the time the Max entered development, Boeing was pushing hard to turn the unglamorous but all-important business of customer training into a profit center of its own. Many pilots were distracted by a dispute with Boeing over the hiring of outside contractors. They contended the quality of training was slipping.

In 2013, a year after a vote that more than doubled the number of unionized pilots, the company announced that it was moving its Seattle-area flight simulators to Miami. There and in cities such as

Edited by James E. Ellis

JOE RAEDLE/GETTY IMAGES. DATA: TEAL GROUP

Singapore and London, amid an historic wave of orders, it relied on hired help known as "purchased service pilots," or PSPs. Boeing's longtime trainers had another abbreviation for them: DBCs, or "dirtbag contractors."

In practice, according to interviews with more than a dozen pilots and engineers who participated in the Max's development, the turmoil left the aircraft's cockpit designers with a lack of input from the instructors who regularly saw how the typical airline pilot responded to unusual situations. Even among the pilots, there were communications breakdowns, partly caused by disagreements over unionization. At times conversations were civil but terse.

Boeing's fight with the pilots came at the same time as layoffs among the engineers and was part of a drive, these people say, to lessen the clout of Seattle-area unions. Company reassignments placed thousands of miles between designers honing flight-deck concepts in Seattle, trainers working with airline pilots in Miami, and a team in California that provides day-to-day support of airplanes in the field. "The driving factor was monetary," says Mike Coker, Boeing's former chief training pilot. "Those relationships between the various professional organizations that for decades resulted in a good product, an improved product—they weren't taken into consideration as much as the bottom line."

In an email, a Boeing spokesman said that "training requirements are mandated by global regulators and implemented by airline customers. Boeing continues to invest in dedicated capability and resources to assist our customers in training." He added that Boeing has 41 full flight simulators in nine locations across four continents.

Three former senior Boeing executives, however, say privately that they regret the profit-driven imperatives imposed on the training process and see it as critical to understanding how a company renowned for meticulous engineering missed the mark so badly with the Max. For century-old Boeing, whose name is nearly synonymous with flight, the crisis isn't only a human tragedy but a deep embarrassment and a financial disaster costing billions of dollars. And it's made Chief Executive Officer Dennis Muilenburg, who's taken heat from congressional leaders and crash victims' families in tense hearings, the technocratic face of a deadly corporate blunder.

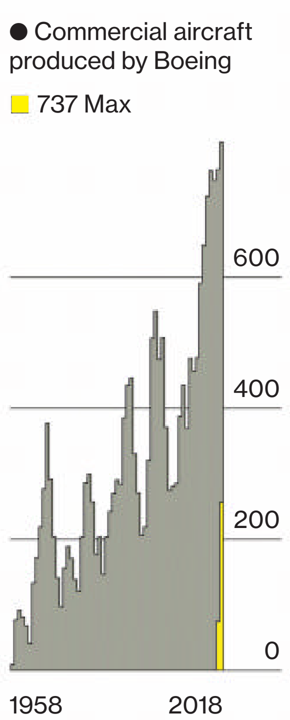
The financial pressure is only mounting after the FAA pushed back on the timeline to get the Max back in the air, prompting Boeing to announce on Dec. 16 that it will suspend production of its biggest cash generator starting in January. The company already has almost 400 newly built aircraft languishing in storage because of a global flying ban that began nine months ago. "This pause may indicate that the reentry into service of the 737 Max is not just around the corner, as bullish investors may have been anticipating," Ron Epstein, an analyst at Bank of America Corp., wrote in a note to clients.

It wasn't supposed to happen this way. In late 2010, Airbus SE surprised Boeing by offering airlines an update of the 737's chief competitor, the A320. The new version would have more powerful engines to save on fuel but few other changes, allowing customers to keep down the costs of training pilots to fly it. Boeing responded by announcing a similar plan to modernize the 737, a plane designed in the 1960s that had already been updated twice.

After a design meeting, Pete Parsons, an executive in the commercial airplanes unit with a mouthful of a title (director of program management best practices and program management functional excellence), declared the plans "the best I've seen." He told Boeing's internal newsletter that he was especially impressed with the "clear communications" and "high level of collaboration." As Jim Albaugh, then Boeing's chief of commercial airplanes, laid out the marching orders for the Max in the December 2011 newsletter: "We're going to make this the simplest re-engine possible. We're only ▶

◀ A simulator at the training center in Miami

● Commercial aircraft produced by Boeing
■ 737 Max



◀ going to touch the part of the airplane impacted by the engine and a couple of other improvements."

The industry was in the midst of the greatest boom of the jet age, as the combination of millions of newly mobile middle-class travelers in Asia and low interest rates prompted airlines to order planes at a frantic pace. In the past decade, carriers have taken delivery of single-aisle jets worth $442.2 billion—36% of all such planes manufactured in the previous half-century, according to the aerospace consulting firm Teal Group. It stretched their ability to train and recruit pilots.

Boeing had long prided itself on the quality of its training, dating to the College of Jet Knowledge it established during the development of the first successful commercial jet transport, the 707 in the 1950s. That plane was put through its paces by the most famous of Boeing's test pilots, Alvin "Tex" Johnston, who wore specially made boots for each new model and gleefully courted risk. In 1955 he stunned Boeing executives by executing a barrel roll in a 707 prototype over a crowd of onlookers at a Seattle festival.

Decades later, the Boeing pilots are a tamer bunch, though some are said to still be members of the Quiet Birdmen, an aviators' club dating to World War I. They're also more specialized. In addition to the Boeing pilots who test new models, there are others who train airline crews or write manuals.

But the company has been trying for years to capture more of the commercial pilot training market, forming a joint venture with a Warren Buffett-owned company in 1997 that ended in 2002 and, in 2003, creating a subsidiary known as Alteon, renamed Boeing Training & Flight Services in 2009. The moves prompted instructor pilots to form a union they called the Lazy B Pilots Association, rankling management and some of the test pilots, who weren't unionized.

The training unit introduced a points-based system for its airline customers akin to the airlines' frequent-flyer programs. Instead of providing expensive simulator time—which can cost hundreds of dollars per hour—for a set number of crews as it previously had, Boeing offered points that could be used for a combination of training for pilots, maintenance technicians, or flight attendants. "It's like swapping fries for boiled potatoes," Alteon's chief, Sherry Carbary, told the trade publication *FlightGlobal* in 2007.

Carbary, now president of Boeing China, warned of a training reckoning for the industry amid the wave of new pilots and said it demanded a single-minded response. "We must, as an industry, find a way to lower the costs," she said at a convention in Orlando in 2007.

▲ Johnston (left) during a Boeing 707 test in 1957

The effort didn't sit well with some of Boeing's instructors. "We felt like shortcuts were being taken and that the quality of training was being sacrificed," says Charlie Clayton, a former Boeing instructor. The airlines, too, had "a vested interest in getting pilots out and flying as quickly as they can, as cheaply as they can."

Tensions boiled over with a plan to use contractors, often retired airline pilots, to fly with crews for initial training. In 2012 the trainers and manual writers voted 4 to 1 to join Boeing's engineers' union, the Society of Professional Engineering Employees in Aerospace. Managers made it known that the vote wouldn't help their chances at promotion, four former workers say. The next year, in the middle of negotiations for a new contract for several dozen pilots, managers delivered a bombshell: They were moving the simulators to Miami, where Boeing had a training center that had been part of the by-then-shuttered joint venture with the Buffett company. Boeing said it was what customers wanted.

As the Max was in development, Boeing squeezed the union in other ways, too, shipping more than 3,900 jobs out of the Seattle area. Among the first to leave Boeing as job insecurity grew were experts in so-called human factors, scientists and psychologists steeped in research of how people interact with machines. Without their input, says Rick Ludtke, a former cockpit designer, "it was easier for the program leaders to drive their wishes into the design teams. They just didn't have people who understood that you need to say no."

● Muilenburg

The beefed-up Miami center wasn't popular with all customers, says Coker, the former chief training pilot. Some objected to instruction from contractors instead of full-fledged Boeing pilots. Other former instructors say the Miami building was shopworn.

But there was a more worrisome consequence: The move disrupted the informal relationships among engineers and trainers in the Seattle area who could easily convene at one of the simulators to talk over designs. (Another type of simulator known as an E-cab did remain in Seattle, employees say, but it was harder to schedule because of the increased demand for it.) "When the simulators

MUILENBURG: JASPER JUINEN/BLOOMBERG. JOHNSTON: ARCHIVE PHOTOS/GETTY IMAGES

were downstairs, there was an extreme amount of crosstalk," Coker says. "We could do a walk-through or a rehearsal of a proposed procedure and see where the flaws were—much harder when you have to go to Miami or tell somebody over the phone."

It was from a hotel room in Miami that former Boeing pilot Mark Forkner—one of the manual-writing pilots—sent frustrated instant messages in November 2016 about a Max simulator that wasn't working, according to a former colleague. When congressional investigators released those messages this October, they caused an outcry because they seemed to suggest Boeing knew of issues long before the Max was flying. What they may show instead is a lousy information loop at the company.

Early in 2016 test pilots and engineers had expanded the authority of a software system that had the ability to point the Max's nose down. It was meant to address a limited stall condition most pilots would never see. But Forkner and others working on the simulator hadn't been alerted about the change or that FAA staff had already observed it activate during test flights. "Why are we just now hearing about this?" Forkner wrote. His lawyer didn't respond to emailed questions.

Problems with the system have been tied to a single point of failure—a vane that measures the angle of the plane's nose against the oncoming wind. When it malfunctions, the measure trips a bewildering array of cockpit warnings including a thumping alert known as a stick-shaker that indicates a plane is in danger of stalling.

Boeing never tested how pilots would respond to such a failure, which later occurred in the accidents. "When they look back, the failure to adequately test this in the sim was Problem One," says Chris Hart, former chairman of the U.S. National Transportation Safety Board, who led a panel of aviation authorities examining the Max's shortcomings. "Fragmentation played a big role in it, the failure to communicate."

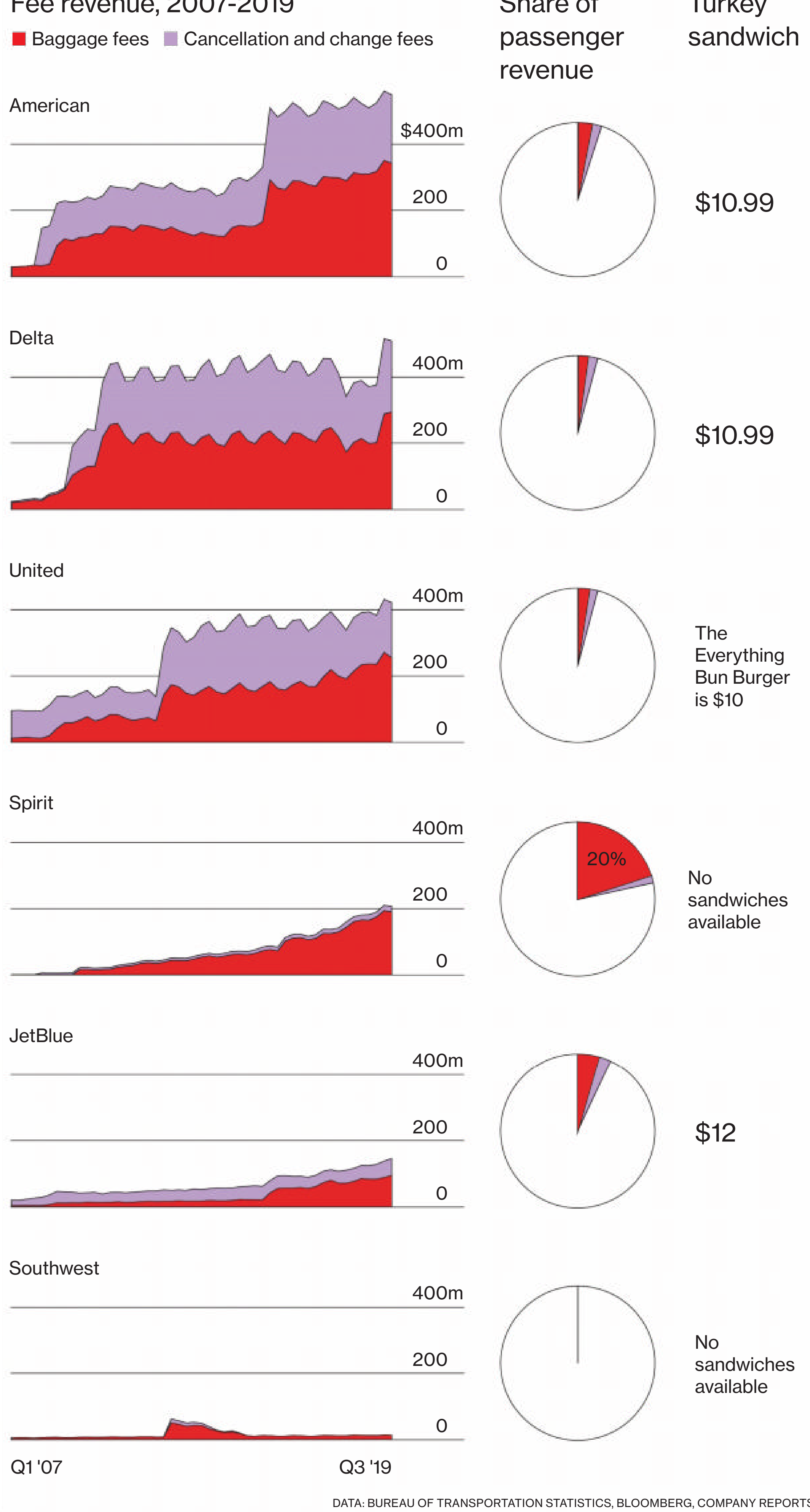
Boeing has vowed a massive pilot training initiative, part of a broader effort to reinforce safety. Pilots say it's recently advertised jobs for more in-house trainers. Muilenburg says Boeing has already begun rethinking the design of its flight decks to ensure human responses are adequately considered.

But no reexamination can reverse the human toll suffered before the Max's initial design and training flaws were discovered. Boeing delivered the first Max jets to a Lion Air subsidiary in mid-2017. Just 15 months later, the carrier's pilots on successive flights were forced to troubleshoot the design problem that Boeing had missed.

Taking the Max through a preflight checklist in Jakarta in October 2018, Lion Air Captain ▶

Those High-Fying Fees

While airfare inflation remains low, ancillary revenue from baggage and reservation-change fees is growing. And an onboard sandwich can easily cost you $10. The outlier to this fee-for-all frenzy: Southwest Airlines, which still gives flyers two free checked bags.



DATA: BUREAU OF TRANSPORTATION STATISTICS, BLOOMBERG, COMPANY REPORTS

◀ Bhavye Suneja typified the new generation of pilots across Asia. At 31, he'd amassed 6,000 hours of flying time, mostly on the 737. He didn't know that one of the tiny vanes that measures the angle of the plane's nose was broken and would set off a terrifying fight for control of the plane. On a previous flight of the same aircraft, a pilot in the jump seat had suggested flipping two switches to cut power to the stabilizer pushing the nose down but had left no mention of it in their logbooks. So Suneja lacked a crucial piece of information that might have avoided tragedy. As a result, horrified crewmen watched from an oil platform as the almost brand-new $120 million plane plunged into the Java Sea, killing all 189 aboard.

Days later, Boeing issued a checklist reminding pilots they can flip the switches to disable the stabilizer. It also began work on a software update to keep a broken vane from triggering the system.

In March, Ethiopian Airlines Flight 302 took off from Addis Ababa and dropped out of the sky six minutes later. Captain Yared Getachew, 29, and his co-pilot quickly recognized that the rogue software behind the Lion Air crash had kicked in. They hit the cutout switches, but amid the confusion left the jet's engines gunning at full takeoff throttle, making it difficult to control. They flipped the switches back on, and the plane dove. An additional 157 people were dead. "We cry every day," says Michael Stumo, father of Samya Stumo, 24, one of the victims. —*Peter Robison and Julie Johnsson*

THE BOTTOM LINE Boeing's efforts to turn pilot training into a profitable business may have hindered staff cooperation that could have detected the 737 Max's design flaws before it entered service.

Short Flight, Big Profit$

● One of Emirates' most lucrative routes is the hop from Dubai to Riyadh

Over 35 years, Emirates has built itself into the world's largest airline, its Airbus double-deckers and Boeing 777s raining down on Dubai around the clock from every corner of the world and helping turn the desert outpost into a vibrant metropolis. But one of its most profitable routes is a two-hour hop to neighboring Saudi Arabia.

Each Sunday morning, the departure hall in Concourse B at Dubai International Airport comes alive with the buzz of business travelers kitted out with dark suits, compact suitcases, and white wireless earbuds. Long lines form at the start of every week for EK 819, the most popular of four daily Emirates flights that pack in a total of about 1,600 seats. The destination is Riyadh, and the cargo is business consultants who live in Dubai on weekends but work for the Saudi government during the week in sectors ranging from education to transport to energy.

First- and business-class seats sell out months in advance. A round-trip economy ticket shoots up to 4,000 dirhams ($1,089) on average during the narrow commuting window and exceeds 5,000 dirhams for a last-minute booking, making it costlier than a round-trip ticket to London. The fare then falls to 1,500 dirhams after the morning rush and into the week. Come Thursday night, Dubai beckons, and the procession of passengers winds its way back to the city, with the price skyrocketing again.

Frequent flyers have perfected their weekly routine. To save time on arrival, few check their luggage. Many choose to travel lightly by storing their workweek outfits at their hotels in the Saudi capital.

While Emirates is known for its huge global footprint, nearby Riyadh ranks as one of its top regional routes in terms of frequency, with 27 weekly flights from Dubai. Saudi Arabia contributes up to 60% of the revenue Emirates generates in the Middle East, according to the state-owned company. It began deploying the A380—a giant plane that typically seats almost 600 passengers on two decks—five times a week on that route this year.

◀ Dubai's airport has become a hub for consultants who shuttle to Saudi for the workweek

COURTESY DUBAI AIRPORTS

"Any airline that is looking to run a hub the way Emirates does will naturally get drawn to Saudi Arabia to get a lot of traffic," says John Strickland, ▶

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◀ director at aviation advisory firm JLS Consulting in London. Most airlines have key routes that form the backbone of their business travel: There's Melbourne to Sydney, Bombay to Delhi, Frankfurt to Berlin. What sets apart Emirates' Dubai-to-Riyadh flight are the extremes of the operation, from the giant planes to the price fluctuations in a narrow time frame and the demand for business- and first-class seats, which sell out long before coach.

Offering alcohol at beach clubs, bars, and restaurants, where men and women can freely mingle, Dubai has become a big draw for expats who enjoy the trappings of low taxes and warm weather year-round. In no small part, the sprawling metropolis, with its skyscrapers, amusement parks, and artificial islands, was built and is supported by migrant laborers from poor countries such as Bangladesh or India.

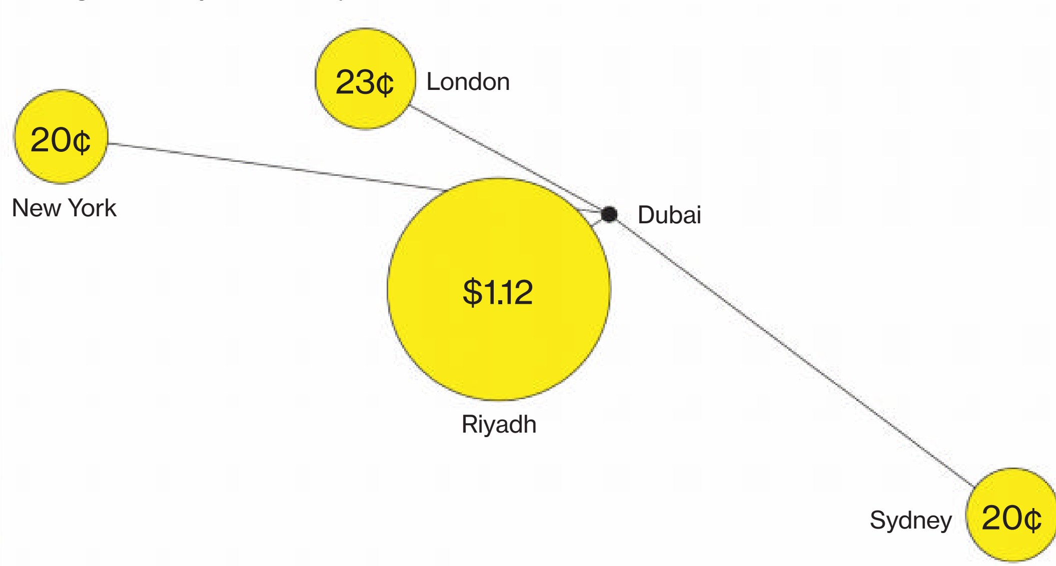
But recent years have been hard on Dubai. Property prices are down about a third since 2014, while tourism, a pillar of the economy, is struggling to grow. In 2018 the economy expanded only 1.9%, its weakest pace in almost a decade. This has forced more residents to seek work elsewhere. And some foreigners who moved to Dubai for high-paying jobs find themselves still living there but traveling to Saudi Arabia on a weekly basis. One of the commuters, who asked to remain anonymous, says he'd never consider moving to Saudi Arabia because, even as the country loosens its lifestyle restrictions, it remains a world apart from Dubai.

Yet what looks like a virtuous business cycle–Saudi Arabia gets expertise diversifying its economy away from oil, Emirates reaps a windfall on the flights, and consultants get to enjoy Dubai's lifestyle on weekends–is coming under scrutiny from Saudi Arabia's rulers. With authorities keen to build a skilled domestic workforce, the wandering consultants are increasingly a thorn in the kingdom's side. In September, Saudi Arabia issued a royal order calling on government officials to hire foreign advisers only when in dire need. That could have a big impact, since Saudi Arabia accounted for almost half of the $3.3 billion of revenue generated by the regional consulting market this year, according to a study by Source Global Research.

The decree left some wiggle room on what constitutes necessary consulting work and who's considered a foreigner, given that the big firms all have local entities registered in Saudi Arabia. It's clear that Mohammed bin Salman, the crown prince, wants to open Saudi Arabia to more global business and make the capital a corporate hub by easing social constraints. More local women are now testing the limits of a restrictive dress code, and Western pop music and movies have become more readily available. "We do see a greater willingness for consultants to move to Saudi," says Michael Stubbs, who works at recruiting firm Cooper Fitch. "With such a significant amount of the consultancy work being based there, we see more people looking at a full-time move with their families instead of spending four days a week away from them."

Why Emirates Loves Its Riyadh Hop

Average economy ticket cost per mile



Emirates wants to keep one of its most lucrative routes intact, particularly when it's focusing more on serving the local and regional market. Shorter flights are becoming a bigger slice of its business as it reconfigures its network and fleet profile after reaching the limits of global growth. With a strong business focus, the regional network is among the company's most profitable, measured by price per ticket and distance flown, with Riyadh far more lucrative than a flight to New York on Emirates.

The local focus is reflected in Emirates' fleet, which previously had consisted only of massive Airbus A380s and Boeing 777s. The carrier has begun ordering smaller aircraft, allowing for more short-range trips and more flights. And cooperation between Emirates and low-cost specialist FlyDubai has given it more firepower to serve the local market at different rates.

For commuting consultants, however, budget is rarely a concern, as reflected in the stratospheric fares their employers are willing to shell out at the beginning and end of each week. Even if some choose to move to avoid the back-and-forth, the lure of Dubai is unlikely to subside soon, nor is the appeal of Riyadh as a place to do business. "Dubai-Riyadh is important because it's a route linking two major financial centers," says Henry Harteveldt, an adviser at Atmosphere Research. "Lots of business travel, and highly profitable." *—Layan Odeh*

THE BOTTOM LINE Almost half of spending on consultants in the Gulf occurs in Saudi Arabia. Emirates has a lucrative shuttle for those workers between Riyadh and fun-loving Dubai.

● Typical price of a round-trip economy ticket for the two-hour hop during prime time

$1,089

DATA: COMPANY WEBSITE

Eller College of Management

eller.arizona.edu

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b. Credit Spread

c. Iron Condor

d. All of the Above

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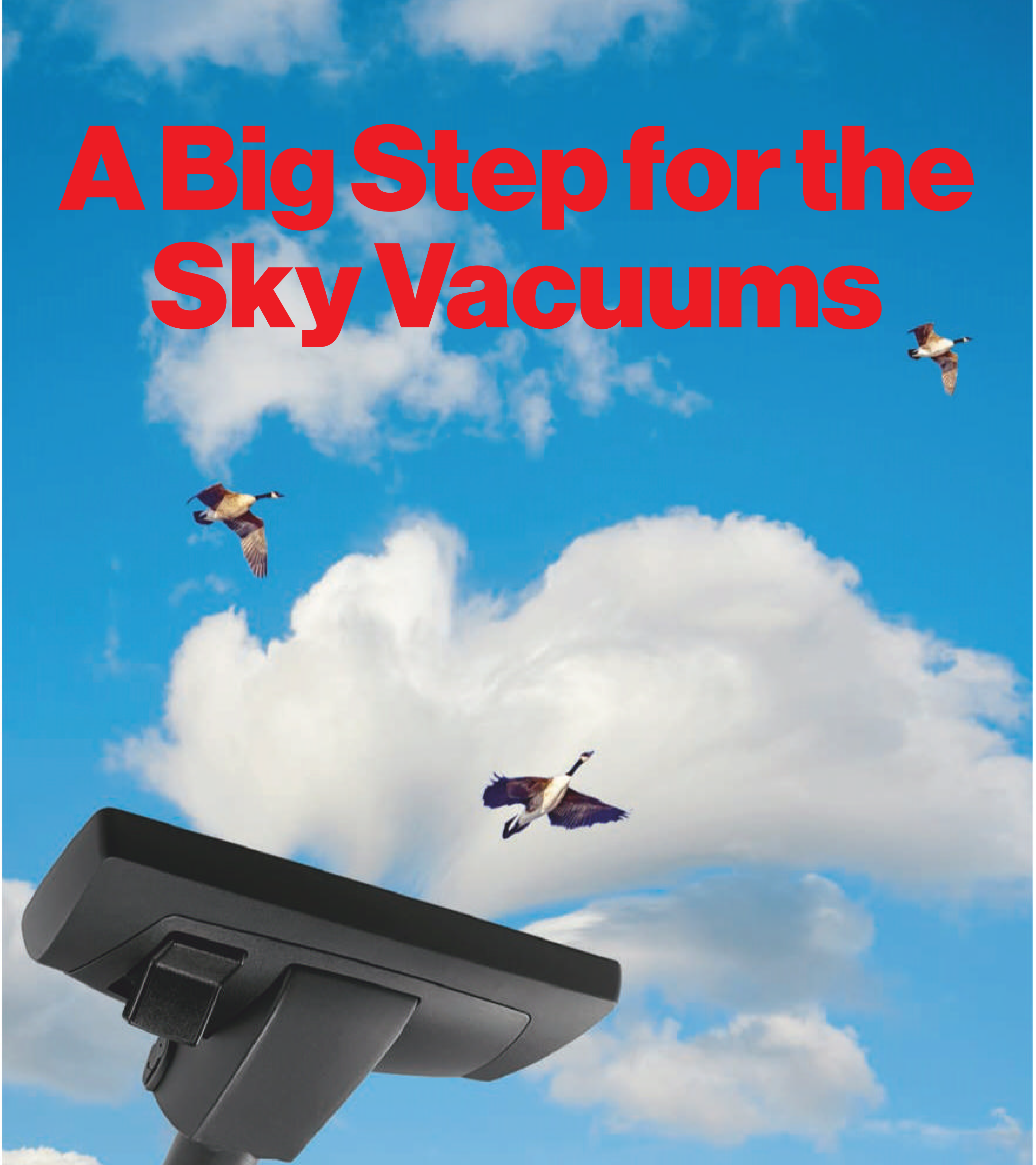


● Companies are bringing down the cost of a controversial weapon against climate change

Halting global warming by sucking carbon dioxide out of the air strikes many people as a dumb idea. It's complicated and energy-intensive. Why not focus on keeping more greenhouse gases out of the atmosphere in the first place—say, by installing more solar and wind power? Stanford engineering professor Mark Jacobson told the Israeli newspaper *Haaretz* in early December that "carbon capture is the Theranos of the energy industry," referring to the company that built false hopes for blood diagnostics.

Some critics even argue that "direct air capture" of CO_2 is a form of greenwashing—i.e., putting a gloss of environmentalism on the dirty business of hydrocarbon production. They point to the involvement of oil companies Chevron, Exxon Mobil, and Occidental Petroleum, which intend to use captured CO_2 to recover more oil from their fields.

The companies leading the commercialization of direct air capture—Carbon Engineering of Canada, Climeworks of Switzerland, and Global Thermostat of the U.S.—say the technology is meant to supplement, not replace, shifts to solar and wind power. They reject the charge of greenwashing, saying the use of CO_2 in oil fields is a transitional step in the decarbonization of the global economy. One long-term plan is to inject the captured gas into basalt rock formations to remove it from the atmosphere.

Most important, the companies are trying to prove that direct air capture can be cheap enough to be deployed widely and soon. An influential study published in 2011 by the American Physical Society estimated it would cost $550 to capture a metric ton of carbon dioxide using one leading method. But ▶

Edited by
Jeff Muskus

PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (3)

◀ in 2018, Harvard applied physicist David Keith and others wrote an article for the journal *Joule* explaining how it could be done for $94 to $232 a ton using inexpensive, off-the-shelf components.

Now a company Keith founded—Carbon Engineering, in Squamish, B.C.—is working to turn those engineering estimates into reality. It's preparing to construct a plant that's designed to remove 1 million tons of CO_2 from the atmosphere annually. It will be by far the world's largest, offsetting the emissions of 250,000 cars. The company announced the million-ton plan in September, just months after saying its goal was a half-million tons a year.

Carbon Engineering's plant will be built at an undisclosed location in the Permian Basin of Texas in cooperation with a unit of Occidental, which will use the captured gas for oil recovery. (Chevron, Australian mining giant BHP Billiton, and Microsoft co-founder Bill Gates are among the company's other investors.) Construction is scheduled to begin in 2021 and finish in 2023. If it works, Keith's company intends to roll out hundreds and eventually thousands of identical plants all over the world.

Chief Executive Officer Steve Oldham says in a video on Carbon Engineering's website that the plant will remove CO_2 at a cost of $100 to $150 a ton. He's been more cautious recently, saying in an interview only that the cost will come in under $200.

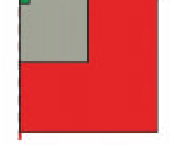
The other two principal carbon-capture companies are also trying to scale up. Zurich-based Climeworks has 14 small plants in operation in Europe. The biggest, in Switzerland, captures 900 tons of CO_2 a year from the atmosphere at a cost of $600 a ton. It has plans to get down to $200 a ton in three to four years and to $100 by 2030. New York-based Global Thermostat aims to suck up 2,000 tons of the gas each year at a plant it's building in Tulsa. Peter Eisenberger, former head of physical sciences at Exxon Mobil Corp.'s research and development department, is its chief technology officer; Graciela Chichilnisky, an economist at Columbia, is the CEO.

There's no question that direct air capture is relatively high-hanging fruit. Even if the cost reductions are achieved, it will still be more expensive than cutting back on emissions. And it's costly vs. other "negative emissions" alternatives: Planting trees costs $15 to $50 per ton of carbon dioxide removed, according to a recent study by the National Academies of Sciences. Capturing CO_2 from concentrated sources, such as flue gases of power plants, is also cheaper than grabbing it out of plain air, where it makes up only four molecules out of every 10,000.

So why pursue it? Because emissions reduction alone won't be enough to stop the planet from heating up. Some emissions will continue for decades—battery-powered passenger jets remain a remote prospect, for example. As for negative-emissions technologies, there's not enough room for all the forests we'd need to plant to stop global warming. Ditto for croplands for growing biomass for fuels. And equipping smokestacks to capture carbon won't be enough, as half of all emissions come from less concentrated sources.

Direct air capture is workable because CO_2 is an acid, meaning it reacts strongly with various bases to form salts. Carbon Engineering will use fans to drive air through plastic sheets dripping with potassium hydroxide, producing a salt, potassium carbonate.

● CO_2 change over one year



■ Amount captured by 1 million trees

■ Amount captured by one direct air capture plant

■ Amount created by 1 million cars

- - Amount created by all cars in the U.S.

◀ A direct air capture pilot plant at Carbon Engineering headquarters in Squamish, B.C.

PLANT: COURTESY CARBON ENGINEERING. ILLUSTRATION BY LIA KANTROWITZ; DATA: CARBON ENGINEERING; IHS MARKIT

In a second loop of the process, the potassium carbonate will react with calcium hydroxide to form pellets of calcium carbonate. Those pellets will get broken down in a high-temperature furnace into calcium oxide (lime), which can be mixed with water for use in more reactions, and CO_2, which can then be used to put fizz in soda, turned into a fuel, or stored underground.

It's a race between chemistry and time. In 2015 the National Research Council issued a report estimating it could take 30 years before direct air capture removes 1 billion tons a year, and it might never get as high as 10 billion tons a year. For comparison, the combustion of oil, gas, and coal worldwide last year generated about 34 billion tons of carbon dioxide, according to the 2019 BP Statistical Review.

But hey, you have to start somewhere. "Time is against us," says Global Thermostat's Chichilnisky. "We need to be building plants." —*Peter Coy*

THE BOTTOM LINE Direct air capture is only one part of a kitchen sink approach to battling climate change, but the science and costs look a lot more promising than they did a few years ago.

Making Big Law More Robotic

● Wilson Sonsini's subsidiary is betting on software to cut costs by as much as 90%

The California Consumer Privacy Act (CCPA), passed in 2018 and set to take effect on Jan. 1, will require an estimated 500,000 companies with annual revenue of more than $25 million to account for the personal information they've filed away about Californians and delete it upon request. All told, the law's adoption will cost those companies about $55 billion in legal fees, employee training, and other compliance measures, according to an impact assessment prepared for the California attorney general's office by Berkeley Economic Advising and Research, a consulting firm. That leaves plenty of room for savings, says Kimball Parker, especially if you can do the legal work with far fewer lawyers.

Wilson Sonsini Goodrich & Rosati is the only one of the top 50 U.S. law firms with an office in the small city of Lehi, Utah. There, Parker is the president of the firm's year-old subsidiary, SixFifty, which aims to deliver the quality of Wilson Sonsini's top legal minds via software. His team of 15 has taken an early lead in the nascent market for legal automation by focusing on the data-privacy law, an issue key to its parent's core Silicon Valley interests.

Parker's team is pitching clients a suite of automation software to help them comply with the new law. Its document program fills out CCPA-required paperwork with a series of prompts written by Wilson Sonsini's flesh-and-blood lawyers. Its training program will look familiar to anyone who's had to complete electronic human resources training sessions; clients can track their workers' progress remotely. And a third piece of software creates a digital pipeline where companies can manage requests to delete personal data.

All told, the services will cost a typical small business $20,000 to $30,000 a year, Parker says, plus a premium for regular updates. "We really wanted to price it so that the funeral parlor in Fresno could afford it and that it would provide significant value for a big public company as well," he says.

The other options on the market tend to require companies to combine traditional legal counsel with software that isn't ready to use off the shelf, says Austin Baird, an in-house lawyer at Vivint Solar Inc., which makes and installs solar panels for a great many Californians. Baird became one of SixFifty's first customers in June, won over by the company's system for handling data requests. (He says Vivint may need to respond to as many as 30 million of them.) "We ultimately decided it was just easier to rely on SixFifty for everything," he says, and the savings have been significant.

Competing on price is also unusual for big law firms such as Wilson Sonsini, whose high fees are a sign of prestige and can be a selling point. That's one reason hourly rates now top $1,500 at brand-name firms, where some partners make ▶

◀ as much as $10 million a year in guaranteed salaries alone.

But billions of dollars of venture capital and private equity investment have flooded the legal industry in recent years—broad bets that technology will be able to handle an ever-wider range of legal tasks and reduce the need for paralegals and associates. Wilson Sonsini is the only major U.S. law firm making a serious bid to bridge the divide by automating its own associates' work.

The firm is well-placed to venture into emerging legal technology. In 1980 it helped take Apple public. In 2004 it did the same for Google. More recently it has represented Lyft Inc. during its initial public offering preparations and advised LinkedIn on selling itself to Microsoft Corp. Parker, a former litigator at rival firm Quinn Emanuel Urquhart & Sullivan, who helped develop document automation software in collaboration with Brigham Young University, is still struggling a bit with the basics of wrangling a sales team. "What I didn't realize is there is actually a mechanism and skill set to sales that has nothing to do with demo-ing the product," he says. "Like, most of sales is following up consistently but in a way that isn't annoying."

The California compliance software went on sale in July; Parker says he expects it to bring in $4 million by the end of 2019. That's roughly the amount of revenue that four of Wilson Sonsini's 770 lawyers generated for the firm last year. But the SixFifty team is a lot cheaper, with a total 2019 budget of about $2 million, the equivalent of about 10 first-year associates' starting salaries.

Parker's efforts are likely to face serious skepticism even from his colleagues, as well as at rival firms, says Dan Linna, a law professor at Northwestern University who's studied innovation in the industry. But he says some degree of automation is inevitable, and Wilson Sonsini should continue to invest in SixFifty rather than relegate it to the role of a marketing tool.

SixFifty says it plans to release similar software next year that can help clients comply with a broader range of data security standards. "Those tools are really just a delivery device for the human expertise," Parker says, adding that it's easy to imagine them applying to the Foreign Corrupt Practices Act, for example. "We will just deploy those tools over and over again until, I don't know, until the cows come home." *—Roy Strom is a reporter for Bloomberg Law*

THE BOTTOM LINE SixFifty is operating like a startup in the shadow of its Big Law corporate parent, but may be a leading indicator of a declining need for Wilson Sonsini's human lawyers.

Land Ho for Silicon Valley's Seasteaders

● A former Google engineer and international-waters expert is trying to fund the development of terrestrial city-states

Patri Friedman is sick of the jokes about floating tax havens. About a decade ago, the former Google software engineer (and grandson of Nobel Prize-winning economist Milton Friedman) co-founded the Seasteading Institute, a nonprofit with the stated aim of developing a model for self-governing offshore communities. The idea was to allow people to set up more laissez-faire laws for themselves on mobile, artificial islands resting in international waters. An invaluable experiment, he calls it now. Also: "Baggage."

The institute's Silicon Valley backers most prominently included Peter Thiel, the conservative billionaire and future Trump adviser, and traded in no small part on Thiel's imprimatur. But the effort was as impractical as it sounds, and it drew criticism from local leaders and good-government groups as a form of neocolonialism. In 2018 locals defeated a commercial spinoff's attempt to establish a seastead off the coast of Tahiti. Seasteading, like vampirism, is now on the unofficial list of topics not to raise with Thiel, who hasn't written the institute a check in at least five years. Nonetheless, he's become the anchor investor for Friedman's new venture capital firm, which is trying to create some similar-sounding communities on land.

● Friedman

Pronomos Capital, which Friedman incorporated in August, is supposed to bankroll the construction of experimental cities on vacant tracts of land in developing countries. Pronomos is set up like a venture fund, making investments in local organizations that do the work of securing government approvals, finding tenants, and hiring retired U.K. judges to enforce the new legal framework, to be based on British common law. The firm says it's discussing semi-autonomous cities of varying sizes with foreign and local businesspeople in countries where officials have seemed receptive to exempting them from area laws, including Ghana, Honduras, the Marshall Islands, Nigeria, and Panama. A given community could start as small as an industrial park, Friedman says. Most will be aimed at foreign businesses seeking friendlier tax treatment.

While other organizations with names such as Free Private Cities and Charter Cities Institute

FRIEDMAN: COURTESY PATRI FRIEDMAN. ILLUSTRATION BY FELIX DECOMBAT

are advising similar efforts around the world, Pronomos is the only one with seed money from boldface names including Thiel, venture capitalist Marc Andreessen, and Bitcoin evangelists Roger Ver and Balaji Srinivasan. In describing his new firm, Friedman isn't shy to use seasteading as a reference point. "I've been putting these ideas out there for 20 years, and they've grown and compounded," he says, sipping well water at his mountaintop compound south of San Jose. "What we get excited about is the ability to do this repeatedly."

Why the colonial-sounding framework, right down to the old British laws? Dressed in a well-loved Slytherin sweatshirt, Friedman says it's the best fuel for a fledgling economy and property values, and to assure global investors that their money will be safe in Pronomos projects. The justice system is more important than the tax breaks, he says, citing research that suggests faith in a functional code of laws is a leading indicator of a region's economic success.

That's been less than reassuring to politicians and residents leery of ceding land to unaccountable foreigners, in exchange for theoretical network effects. Fierce local opposition has halted a plan to create an independent area on a stretch of coastal land in Honduras, for example. The proposed tax incentives and other benefits for foreign investors were about as popular as you'd expect. "That land belongs to someone," says Silvio Carrillo, the nephew of assassinated Honduran rights advocate Berta Cáceres.

Pronomos "will only go where we are wanted," according to Friedman. He also says, with a straight face, that if Pronomos can get local officials to agree to its plans, "we have a credible shot at eliminating poverty."

Friedman's grandfather spent his life attacking government oversight in the field of economics, but his father, a law professor at Santa Clara University, has advocated for a kind of anarcho-capitalism on a legal basis. At age 43, Patri Friedman has pushed his family's do-what-you-feel ethos to some other extremes, advocating for communal living, polyamory, and human-machine hybridization. He's spent most of his career at Google, including his Seasteading Institute years. He left Google this summer to work full time on Pronomos.

The venture firm has raised about $9 million so far (more than half from Thiel), well short of Friedman's initial goal. He says that's only enough to cover basic fact-finding expenses for his local partners, and he'll raise more to buy and develop land once governments approve the plans.

Similar ideas have gained some support beyond fringe libertarian circles. Honduras amended its constitution in 2013 to allow the creation of special economic zones outside the country's legal framework. Erick Brimen, a startup founder who has coordinated development projects in Central America, is informally working with Friedman and others on Prospera Honduras, a local business advocacy group there. Brimen says it's too early to discuss publicly. Other groups aiming for these kinds of extralegal territories have announced priorities including tax holidays and privatized health care and police forces.

"Our vision aligns" with Friedman's, says Taavi Kotka, who runs an Estonian organization advocating for looser employment and tax laws to attract immigrants. "He's a pioneer in setting up these special zones," blockchain enthusiast Barak Ben Ezer says of Friedman. He and Friedman are working to turn the Marshall Islands into a tax haven similar to the Caymans. Friedman says he hopes to back more than a dozen projects in the next four years.

Yet even if Friedman and the other landsteaders can assuage concerns about colonial-style exploitation and the flouting of local laws, there are few guarantees in the world of quasi-sovereign states. In April a couple proclaimed their small fiberglass pod, 14 miles off Thailand's coast, was its own nation, and the Thai government sent its military to destroy their new home, calling the proclamation an act of war. The couple has been in hiding since then. That's why, says Friedman, he's making sure any Pronomos projects have local officials on board. Further out, "Do I want to create the first venture-backed city-state? Hell yeah," he says. "That's what I'm in it for. That's the long-term goal." —*Lizette Chapman*

"Do I want to create the first venture-backed city-state? Hell yeah"

THE BOTTOM LINE Friedman has a long way to go to convince critics and skeptics that carving out territory inside other nations can and should work, but he's got Thiel and others on board again.

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How Wall Street Hides the Ball

● A guide to the legal and not-so-legal sleight of hand banks use to mask their true condition

On a Friday afternoon in November, the long story of the global economic crisis reached a milestone: More than a decade after the fact, a court convicted senior executives from major banks for crisis-era crimes. Outside of Iceland and Ireland, such convictions have been rare. In Milan's judicial complex, the judge sentenced 13 former executives of Deutsche Bank, Nomura Holdings, and Italy's Banca Monte dei Paschi di Siena to prison terms as long as 7½ years. Significantly, these men hadn't been convicted of causing any of the market losses that crippled the banking system in 2008. They'd been convicted of hiding them.

The cover-up wasn't just worse than the crime. It *was* the crime. Deutsche Bank and Nomura had structured a complex set of derivatives that Monte Paschi used to erase about $800 million of red ink from its books. Today, as investors and regulators scan the horizon for the next threat, the Milan convictions are a reminder that the danger might not be visible through the fog of financial fakery.

Despite a decade of post-crisis reforms, financial companies still use tricks to obscure their true condition. Often these moves are legal. Sometimes they're not. And sometimes they fall into a gray area that regulators haven't yet imagined they need to police. "Don't tell me everything is better now," says Anat Admati, a finance and economics professor at Stanford's Graduate School of Business. "You have to assume you're only seeing a fraction of what's going on in fake finance."

In fact, tough new rules have proved the mothers of invention, and fresh examples of reality-bending financial practices keep popping up. Here's a guide to the techniques of financial obscurantism, old and new.

● WINDOW DRESSING

In October, European Central Bank supervisors reported a curious thing happening at some of the biggest European banks. About 35 days into a hypothetical stress test period, a key measure of the banks' ability to meet their obligations would ▶

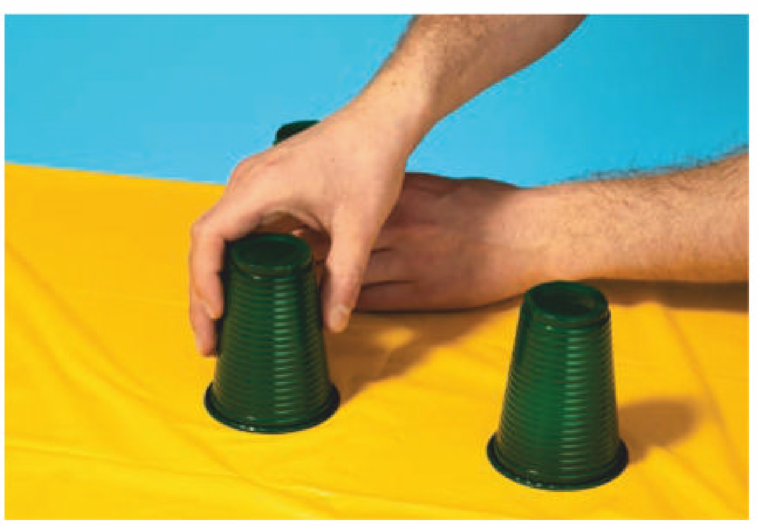
Edited by
Pat Regnier and
Rebecca Greenfield

◀ tank, just a few days after it had been calculated to meet a regulatory requirement. In their report they called the moves "optimization" strategies.

The measure in question is the liquidity coverage ratio—basically a bank's ability to get its hands on cash in a hurry. A ratio of 1-to-1 is the goal. The first part of that calculation is high-quality liquid assets—holdings the bank can sell quickly without taking a hit on price. The more of those a bank has, the better it can weather a storm. The second part is the expected size of the storm, measured as the cash that will likely flow out of the bank in the next 30 days.

Optimization is how banks pump up the amount of bulletproof holdings they can report. Post-crisis rules say a bank can't count as a liquid asset any bonds it's issued itself and still holds. Competitors are in the same fix, owning self-issued bonds they can't count as liquid. Swapping them temporarily solves everyone's problems. And that's what they were doing, using short-term repurchase agreements that give each bank the right to borrow against the other bank's bonds. This maneuver allows both sides to count the other bank's bonds as liquid assets. The ECB declined to comment on its discussions of this issue with the individual banks.

● LOSING LEVERAGE



The financial crisis is often remembered as a mortgage meltdown. But it began with the implosion of Lehman Brothers Holdings, and that involved fake finance.

Banks are measured by the value of their assets—the securities they own and the loans they've issued. They acquire most of those assets and fund most of the loans by borrowing money, while using their own money, or capital, as well. If a bank has a huge amount of assets relative to its capital, that means it's borrowed a lot—and that it could get in trouble during a financial squeeze.

Lehman was able to make its assets look smaller than they were. A few days before the end of a quarter, it borrowed money for a short time, putting up securities as collateral. It used that money to pay down other debts. It treated this deal as a sale of securities—as if it had sold an asset, settled a debt, and thus gotten smaller and less risky. But it would soon be obligated to buy back the security and take out another loan to do it, returning to the same size it was before the trick. In the second quarter of 2008, a few months before its collapse, Lehman looked $50 billion smaller than it actually was thanks to such deals, according to the findings of a bankruptcy court examiner.

The trick Lehman used is no longer possible in the U.S., where averaging of assets is required for most capital calculations, not a single snapshot. But that's only one tactic. The lesson from Lehman? "Well, just the continued availability of accounting tricks to dress up your regulatory ratios," says Sheila Bair, chairman of the U.S. Federal Deposit Insurance Corp. during the crisis, who spoke in an interview for the web series *Bloomberg Storylines*, in an episode on financial fakery. "It's still going on."

● RISK HIDING

Capital is a bank's bedrock. The money the bank gets from investors when it issues stock? That becomes capital. The bank makes a profit and doesn't pay all of it out as a dividend? What's left is capital. The point of capital is that if some of the bank's investments go bad, the bank can stay alive—it's essentially the money it doesn't have to repay to anybody.

Like the homeowner who needs to come up with a down payment on a house to qualify for a mortgage, banks must have a certain amount of capital in relation to the risk they're taking. Where 20% equity is good for a house, regulators widely consider capital above 10% of assets as safe for banks. But bankers don't like having so much capital—they'd rather use more borrowed money to make loans or buy investments to juice their returns on capital. One way to reduce the amount of capital they must have is to make "risk adjustments" to their assets.

"You have to assume you're only seeing a fraction of what's going on in fake finance"

Look at any big banks' accounts, and you'll find more than one capital ratio. There's the one the banks highlight in their reports, which looks really good, averaging 13% among Europe's top 10 banks and 12% among the U.S.'s top eight as of the end of the third quarter. And then there's the one further down that comes in at about half those levels—4.7% in Europe and 6.6% for the U.S. The difference? In that first number (called Common Equity Tier 1), the raw assets are "risk-adjusted" before they're put into the equation. Less risky assets essentially become smaller so that the relative amount of capital looks bigger. That's right: The banks get to decide that ▶

some assets are less risky and can choose not to fully count them. Assets such as government bonds don't count at all, meaning European banks can hold piles of Greek and Italian bonds and treat them as if they hold zero risk.

Although the adjustments the banks make in-house are supposed to be reviewed by regulators, mistakes still slip through. Earlier this year, the U.K.'s Metro Bank admitted it miscategorized some mortgage loans in a way that undercounted its assets. After it disclosed the problem, it had to raise £350 million ($456 million) in new capital.

Everybody risk-adjusts. JPMorgan Chase & Co., the biggest U.S. bank, says its capital backs up 12% of its assets when they're risk-adjusted. The ratio drops to 6% without the adjustments. That's because the adjustments shrink the bank's $2.8 trillion balance sheet to $1.5 trillion. The shrinking balance sheet is more striking at European banks, which have broader leeway to use internal formulas for credit risk. Deutsche Bank AG's €1.5 trillion ($1.67 trillion) balance sheet becomes €344 billion after risk-weighting. That helps its capital ratio jump from 4% to a risk-adjusted 13%.

● CAPITAL RELIEF

Some risk adjustments sound reasonable—U.S. and German government bonds really are safe—but they're still more art than science and wide-open to being gamed. For example, banks can pay someone to take their risk away for them. "Capital-relief trades" have in effect moved hundreds of billions of dollars off banks' balance sheets by making it look as if loans the banks have made don't exist. These trades essentially take the form of insurance policies guaranteed by counterparties that include hedge funds. It's good to have insurance. The problem is, in a meltdown, those counterparties would need to be able to make good on their obligations for the trade to hold up.

A 2017 deal by Rabobank Group, the second-biggest Dutch lender, moved the risk of default on €3 billion of private loans to a Dutch pension fund. The transaction helped Rabobank cut its risk-weighted assets by €1 billion, the bank said at the time, without providing further details.

In a 2015 report, the U.S. Treasury's Office of Financial Research found that 18 large U.S. banks had made $38 billion of capital-relief trades the previous year that could have boosted a bank's capital ratio by as much as 4 percentage points.

Capital-relief trades are an example of shifting risk from banks into the shadows, to nonbank entities such as hedge funds that don't get anywhere near the same scrutiny. "As regulation tightened, some of the risk has shifted to other parts of the financial system," says Nicolas Veron, a senior fellow at the Peterson Institute of Economics in Washington. But the trades could pose a contagion risk that gets back to banks anyway. A hedge fund selling insurance often borrows from banks to finance its investments. If losses were to mount high enough, the fund might not be able to repay its lender—or the bank counting on its insurance policy.

● THE ITALIAN JOB

The Milan convictions (which are expected to be appealed) of former Deutsche Bank, Nomura, and Monte Paschi bankers were the culmination of one of the most audacious known episodes of fake finance. When Paschi, the world's oldest bank, started suffering losses toward the end of 2008, its outside investment bankers offered what seemed to be magic solutions. In the case of the deal Deutsche Bank pitched, Paschi would enter into two different trades of derivative contracts. One would be an instant winner that would extinguish current losses, and the other would be a sure loser—but far in the future.

For the purposes of the yearend reports, shareholders and regulators would have no idea there had been massive losses on the initial bet, let alone that the bill would eventually come due. Paschi had to restate its financials (and get government bailouts) after Bloomberg News uncovered the fakery in 2013. Deutsche Bank, in addition to reaping millions in fees, found a way to keep the transaction off its own balance sheet by having its components of the deal cancel each other out. Deutsche Bank, too, ended up adjusting its accounting.

The big banks don't dispute that tougher regulation—especially higher capital and some minimum liquidity requirements—was necessary after the 2008 crisis. But they argue that the pendulum has swung too far and excessively tight rules are hampering their ability to provide credit to the economy. "How much is enough capital?" Morgan Stanley Chief Executive Officer James Gorman ▶

PREVIOUS PAGE AND THIS SPREAD: PHOTOGRAPHS BY STEVEN MINER FOR BLOOMBERG BUSINESSWEEK

◀ asked the audience at an industry conference in October. "Let's do at least what you would have needed to get through the financial crisis without a problem. Fair start. And let's dial it up a bit because things could get worse. Fair enough. And let's add a buffer to that because there are always unintended things. And let's add another buffer because we can. … Well, hang on."

Gorman's panel mate, JPMorgan CEO Jamie Dimon, said the post-crisis rules had addressed the lack of capital and introduced important safeguards. Lehman Brothers wouldn't fail if it were regulated under today's rules, he said, but banks are asking that the rules be made less onerous.

The Bank Policy Institute, a trade association representing the largest U.S. and European banks, has railed against eliminating risk adjustments in capital calculations. "It is akin to setting the same speed limit for every road in the world, whether it's a highway or a school zone," BPI President Greg Baer wrote in a 2017 blog post. For Stanford's Admati, though, the metaphor misses the regulatory reality. "Risk weights help banks obscure, evermore, the totally reckless speed at which they are still driving," she says. —*Vernon Silver and Yalman Onaran*

THE BOTTOM LINE Financial companies around the world are still using accounting maneuvers that mask the true state of the industry, as they did before the financial crisis.

#MeToo? Wall Street *Still* Doesn't Get It

● Some apologies, yes, but the day of reckoning has yet to arrive

The unusual thing about the sexist comment from money-management billionaire Ken Fisher wasn't what he said or how many people heard him—it was that he got into trouble for saying it. For at least a decade, the head of Fisher Investments, an empire that oversees more than $115 billion, has been known to make casual references to sex and genitalia in front of his colleagues and peers. People who've worked with him say the usual response to his inappropriate language is nervous laughter or awkward silence. He suffered no fallout when he said at a conference last year that his life's regret was not having more sex, after comparing a mutual fund that brags about performance to a bachelor who walks up to a woman in a bar and asks her to sleep with him.

That response shifted in October when Fisher made a crude analogy between the art of wooing clients and seducing women. This time, the unwritten industry rule that values discretion and relationships above most everything else didn't stop at least three people in the audience from saying they were floored. Then several clients started fleeing: pension funds in Michigan, then in Philadelphia, Boston, and Iowa; soon after, Fidelity Investments and Goldman Sachs Group Inc. Altogether they pulled about $4 billion. It took two days after the conference for Fisher to apologize—at first he said he didn't get what the fuss was about.

More than painting a picture of rich men behaving badly, tales like the Fisher saga show that powerful parts of the finance industry haven't caught up with the times. Other stories this year, from assault and unwanted touching at ritzy London firms to allegations of harassment in a New Jersey brokerage, reveal why. Even in an era when just about every company says it champions diversity and craves inclusion, a corporate machine silences employees and maintains Wall Street's status quo. To workers in all sorts of jobs, the mechanics will sound familiar: forced arbitration, captive human resources departments, high-priced lawyers, and a culture of fear. But the finance industry's mastery of this system has prevented the revolution of the past two years from disturbing it. Instead, there've been only rare moments of revelation that hint at what future change might look like.

Wall Street can still resemble a fraternity with nicer houses. Men built almost all the big banks, private equity firms, hedge funds, and asset-management companies. Even if men can no longer openly expense trips to strip clubs, they continue to run the industry. Beneath the sanitized surface is an old mix of entitlement, exclusion, and secrecy. Once the #MeToo movement began, finance, unlike so many other businesses, didn't have a major reckoning or, in some corners, experience much reflection. "The primary difference for women that speak out on Wall Street vs. other industries is money. And money is power, and Wall Street has the most," says

"The system was invented by firms to protect firms' own interests"

Jeanne Christensen, a partner at the employment law firm Wigdor LLP, whose clients have fought major banks and hedge funds. "Going up against them is not the same." Some finance executives even reacted to #MeToo by steering clear of their female colleagues, as if they were the problem.

Journalists who write about the landscape of Wall Street often first encounter its self-protective mechanisms when they try to report on its bad behavior. In the earliest days of #MeToo, when women in finance quietly shared stories about being grabbed, propositioned, and kissed out of the blue, most said they had too much to lose if they spoke out. In the cases when women were prepared to talk openly, Wall Street's public-relations specialists jumped into action. They told reporters not to trust these women—in one recent case because she was flirty, in another because she was too aggressive, in a third because she's past her prime.

Then there's an arm of the system that tries to prevent workers from speaking out in the first place. At the 331-year-old insurance exchange Lloyd's of London, a woman who says a senior manager drunkenly attacked her in a pub was convinced by HR that it would be bad for her career to pursue a grievance. At London's M&G, which manages about $450 billion, when a woman complained about a top money manager, HR told her to smile less around him and dress more conservatively. Christensen, the attorney, says most of her Wall Street clients feel they can't even go to HR.

The few women who try to sue are sent behind the closed doors of the arbitration system. Brokerages helped pioneer the shadow legal process decades ago by winning Supreme Court cases that allowed the practice to spread to corporate America. Now, workers at 2 out of 3 big nonunion companies are bound by mandatory arbitration. It spares companies from the embarrassment and cost of lawsuits, while keeping victims from learning about one another and banding together. It also gives employees worse odds of winning, and smaller judgments if they do, says Alex Colvin, who teaches dispute resolution at Cornell. Several tech giants have stopped making employees sign away their right to sue over harassment, but the finance industry isn't budging from a system it says is cheaper and quicker but fair.

Lee Stowell disagrees. She's fighting to stay out of arbitration. The bond saleswoman sued her former firm, Cantor Fitzgerald, saying she put up with years of locker-room behavior and lost her job when she complained. The brokerage argued that she had to keep her complaint behind closed doors, and the two are currently tangled in a battle over where she'll get to air her grievances. (In March, a judge sided with Stowell; Cantor denies her allegations and is appealing.)

Unlike other industries, Wall Street has a self-regulatory arm that runs its own arbitration hearings; judge and jury are replaced by a small panel of decision-makers, mostly white and male. Transcripts of a case between a risk specialist and the big bank he used to work for showed an absurdist maze. One arbiter fell asleep, another left for the bathroom at a key moment, and lawyers bickered over a granola bar. There's less testimony, fewer documents, and rarely an appeal. "We shouldn't lose sight of the fact that the system was invented by firms to protect firms' own interests," says David Noll, a Rutgers Law School professor who studies legal institutions.

No woman has ever held the top job at any of the six biggest U.S. banks. But even the single most powerful person at Lloyd's was no match for a culture older than the U.S. itself. When Inga Beale, the first woman to run the insurance exchange, pushed to modernize its sexist attitudes and boozy behavior, men asked one of her friends to have Beale "tone it down." One anonymous note sent to the chief executive officer's sixth-floor desk told her to "go and die"; another message said she should stop talking about her bisexuality. Beale left and was succeeded by a man who'd married one personal assistant and then began a relationship with another.

Fisher eventually apologized for his comments and said they were misconstrued. Looking at it one way, the trouble he got into was a fluke, and the billions of dollars of withdrawals were just a slap on the wrist for an executive who's still running the company. But it could also mark the beginning of a cultural shift. At BlackRock Inc., CEO Larry Fink told the company's 20 or so highest-ranking officials that their behavior was being held to a higher standard. Two of the men in that group are now gone. The world's largest asset manager fired them, one just this month, for breaking rules about relationships with colleagues.

There was a brief window this year when it felt like a lot more was about to change. In July, the millionaire financier Jeffrey Epstein stepped off his private jet and was arrested on charges of sex trafficking underage girls. As he sat in prison, it seemed his case was about to trigger a reckoning for the major Wall Street figures who'd embraced and enabled him. Instead, he died. —*Max Abelson and Katia Porzecanski, with Sabrina Willmer and Gavin Finch*

THE BOTTOM LINE Wall Street is dominated by men, and things like forced arbitration have helped it stifle women and maintain its frat house culture.

● Beale

● Stowell

PHOTOS: BEALE: CHRIS J. RATCLIFFE/BLOOMBERG; STOWELL: EVA O'LEARY. DATA: BANK FOR INTERNATIONAL SETTLEMENTS, FEDERAL FINANCIAL INSTITUTIONS EXAMINATION COUNCIL

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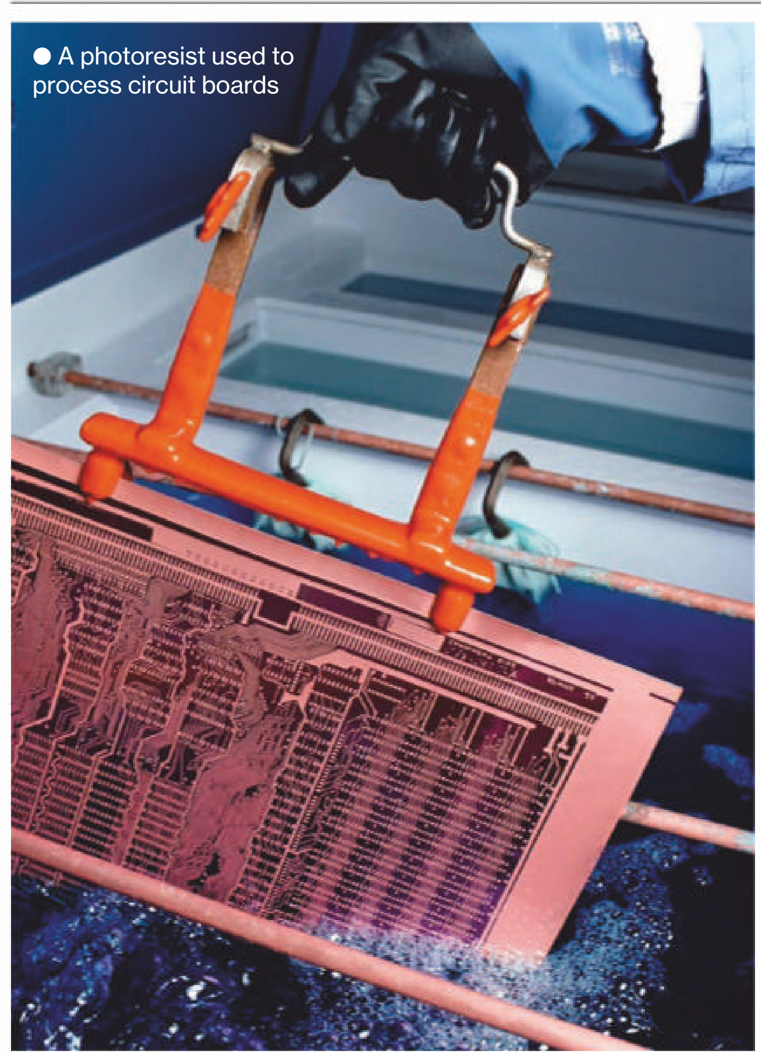
The Chemicals Between Us

Japanese export curbs have exposed a vulnerability in South Korea's development strategy


● A photoresist used to process circuit boards

Think of them as weapons of mass disruption. Three ingredients crucial to the global supply chain for smartphones and semiconductors are caught up in a diplomatic wrangle between Japan and South Korea whose origins date to long before either country had transformed itself into a consumer-electronics powerhouse.

In July authorities in Tokyo began requiring Japanese businesses to apply for licenses to export fluorinated polyimide, hydrogen fluoride, and photoresist—a liquid used by semiconductor makers to imprint silicon wafers—to South Korean customers, a process that can take 90 days or more. The three chemicals are essential inputs in the manufacture of memory chips as well as TVs and other types of displays, which are pillars of South Korea's $1.6 trillion export-driven economy. They are utilized in the production of Apple iPhones, Dell laptops, and a broad range of Samsung devices.

In the weeks that followed, Japan also removed South Korea from a so-called white list that accorded it preferential treatment on exports of materials deemed sensitive because they have military as well as civilian uses. These maneuvers are part of a global trend in which trade and investment rules are being weaponized in disputes between economic or geopolitical rivals—the most obvious example being the U.S.-China confrontation. "Once countries go down the road of using trade policy as a way to increase their geopolitical influence, it sets a precedent that could be quite harmful to trust in the supply chain," says Shaun Roache, chief Asia-Pacific economist at S&P Global Ratings.

The conflict between the two Asian nations harks back to a 1965 treaty that was supposed to put an end to all Korean claims against Japanese parties originating from the years of the occupation, which lasted from 1910 until 1945. Yet Korean courts have ruled in multiple cases over the past decade that Japanese companies must compensate Korean workers forced into labor during that period. Japan's move to restrict exports came six months after one Korean court approved the seizure of a Japanese steelmaker's assets in Korea, a ruling that threatened to establish a precedent.

Fluorinated polyimide, hydrogen fluoride, and photoresist make up only a fraction of Japan's $55 billion a year in exports to South Korea, yet they are integral to the consumer-electronics industry. Fluorinated polyimide is a plastic film that's used as an underlying layer in the screens on mobile phones and other devices. Japan supplies 90% of the material for this use, according to Display Supply Chain Consultants, a market-research group. A key buyer is Samsung Display, a unit of one of South Korea's leading *chaebol*, the sprawling ▶

Edited by Cristina Lindblad

H. MARK WEIDMAN/ALAMY

◀ conglomerates that dominate the economy.

A clutch of Japanese producers, along with some German companies, dominates global production of hydrogen fluoride, a purified gas used to etch circuits on silicon wafers, with Japan supplying about 44% of Korean manufacturers' requirements, according to Société Générale SA estimates. SK Hynix Inc. buys Japanese-made hydrogen fluoride for its plants in South Korea.

Japan also commands about 90% of the world supply of photoresist. If Tokyo were to completely cut off shipments to South Korea, it would hobble Samsung Electronics Co.

Policymakers in Japan are exploiting a vulnerability of the development model that South Korea has used with enormous success since the 1960s: a focus on exports that helped take the population from rags to riches. South Korea's annual exports are equal to 40% of gross domestic product. This Achilles' heel was exposed in 2016, when Beijing orchestrated a boycott of Korean businesses to protest the deployment of a U.S.-funded missile defense system. South Korea has also suffered collateral damage from President Trump's trade war with China, which has disrupted supply chains across Asia and depressed corporate investment. Exports have contracted in each of the past 12 months.

Japan has rejected characterizing its moves as retaliation, and Tokyo and Seoul have lately tried to patch up their differences. Even so, South Korean companies are working to develop alternatives for essential inputs sourced from Japan. Samsung is testing materials from different local suppliers, says a person familiar with the matter, who asked not to be named because the discussions are private.

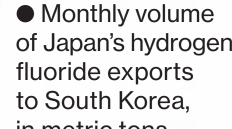
Main Info, a Korean startup that's developing a navigation system using holograms, is in talks with a German supplier of photoresist after failing to get approval to buy in Japan, says Park Ik-hyun, chief executive officer at the company.

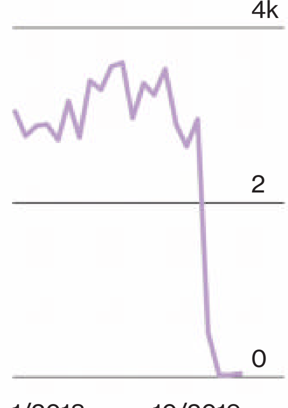
But for Korean companies that buy in bulk, high-quality, competitively priced substitutes for Japanese materials are tough to find, says another person familiar with the matter. The country's trade deficit with Japan in materials, components, and equipment needed in the production of goods including semiconductors and displays amounted to $22.4 billion last year, according to the Finance Ministry, which in a statement called it a "structural vulnerability that threatens national security and manufacturing competitiveness."

South Korean President Moon Jae-in has moved to address the issue, putting an unspecified amount of his own money into a multimillion-dollar government fund set up in August to invest in Korean suppliers. The government plans to spend $1.8 billion on deepening domestic supply chains in 2020. Meanwhile, a presidential advisory committee is working on a broader plan that could include loosening labor and environmental rules. The stock prices of several South Korean suppliers to the semiconductor industry, including Soulbrain Co. and Ram Technology Co., have surged in anticipation.

A bigger question is whether South Korea can lessen its overall dependence on trade. The Moon administration has mounted a bold plan to bolster domestic demand by raising the minimum wage. It increased 11% in 2019, following a 16% hike in 2018. Even so, growth in private consumption hasn't been sufficient to offset the drag from slower investment and exports. Bloomberg Economics estimates GDP expanded 1.9% in 2019, largely on the strength of stepped-up government spending and interest-rate cuts. "The key structural challenge for Korea is to rethink its economic structure," says S&P's Roache. —*Min Jeong Lee, Heejin Kim, and Sam Kim, with Pavel Alpeyev*

THE BOTTOM LINE Japanese export restrictions on certain chemicals have South Korean companies and the government scrambling for alternatives.





Commuter Towns Court Millennials

● Yonkers and New Rochelle have their eyes on young professionals priced out of Manhattan and Brooklyn

A literal arms race is heating up between two commuter towns in New York state's Westchester Country. Ax-throwing bars are in the works in New Rochelle and Yonkers, whose city planners see the edgy pubs as a means to draw millennials away from Manhattan and Brooklyn. Both are angling for affluent urbanites who like their bars and bagels close but are sick of feeling poor in the Big Apple. If they succeed in getting Gothamites to move, however, they risk driving rents too high for locals.

New Rochelle and Yonkers are selling location—a half-hour train ride from Midtown Manhattan, with rents at a fraction of the cost—and preparing for an influx of city exiles by building apartment

towers outfitted with luxury amenities such as dog-washing stations and rooftop fire pits. The way they see it, every New York City rent increase means more potential Westchester residents.

"Let them raise rents—please keep on making it expensive, because then people are going to have to make a choice, right?" says Luiz Aragon, the development commissioner of New Rochelle, who's overseeing the revitalization of the downtown, an approximately 300-acre project that includes three luxury buildings already welcoming renters. At his offices, an advertisement set on an easel features a digital rendering of the skyline as it will look five years from now, every window gleaming in the evening sky. "The New New Rochelle," it reads. "Your City Outside the City."

Westchester's property taxes are already among the nation's highest. So the county is on a push to boost population density to raise revenue for its bulging public school budgets. The building boom is most intense in New Rochelle, with a population of 79,000 inhabitants, and in Yonkers, which is just shy of 200,000. Both have struggled to turn around their fortunes since an explosion in suburban malls in the 1970s and '80s hollowed out their downtowns. The municipalities are banking that a growing population of well-educated, mostly single workers could bolster the tax base without burdening the schools with more children, as well as attract new employers. So they're encouraging development with long-term tax breaks and speedy permit approvals.

New Rochelle, which was the setting for the 1960s sitcom *The Dick Van Dyke Show*, has a pipeline of 6,300 luxury rental units in the works, street Wi-Fi kiosks, benches that double as phone charging stations, and a free on-demand shuttle service. New businesses include the Encore Esports video game tournament lounge and the Bad Axe Throwing bar, set to open this winter. "We're not anticipating everyone will pick up and leave Brooklyn and Manhattan, but a small fraction is enough," says Mayor Noam Bramson.

Building so late in the economic cycle—America's record-long expansion is now in its 11th year—has obvious risks. A decade ago, cities in Westchester County including Yonkers and New Rochelle also added units at a fast pace. Then the bottom fell out of the market. On the flip side, if demand for the luxury rentals does materialize, it could drive up housing costs in the county's last remaining affordable towns, says Lynn McCormick, an associate professor of urban planning at Hunter College who lives in New Rochelle. "We're hyperdeveloping areas around transit hubs, hoping to attract people with money," she says. "It's the gentrification story all over again. The inner cities are tapped out, so now we're going to the suburbs."

Beth Acocella, a New Rochelle native and sales agent at the 110-unit Millennia rental tower, says she hopes young New Yorkers arrive but suggests the city should put equal effort into drawing older locals who are downsizing out of single-family homes. The Millennia will feature an indoor putting green, free internet, and concierge services such as dog walking. Rents will range from $2,150 for a studio to $3,800 for the most expensive two-bedroom units. "I want all this new development to work. We want more people in the city who will go to the wine bar and walk their dog in the dog park," she says. "The risk could be too much inventory."

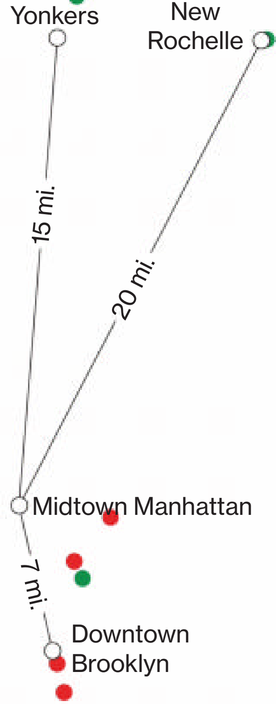
Yonkers has about 5,900 luxury apartments under construction, street corner artwork, and a slogan that's a nod to the demographic it hopes will lift the sagging tax base: "Generation Yonkers." The recent talk of recession has only spurred Mayor Mike Spano to move more quickly with a revitalization project that's already showing some early signs of success. There's a Brooklyn-style bagel shop and a gym coming. And Lions Gate Entertainment Corp., drawn by federal tax breaks for investing in lower-income communities, is planning a $100 million-plus production facility.

Choudhary Chilukuri, a 34-year-old graduate student at Mount Sinai medical school, says he and his wife only considered Yonkers because they were so disappointed with what they could ▶

● Driving distances in the New York metropolitan area

● Ax-throwing bar

● Ax-throwing bar coming soon



▼ An apartment building under construction in downtown New Rochelle

PHOTOGRAPH BY ROB STEPHENSON FOR BLOOMBERG BUSINESSWEEK. DATA (LEFT): MINISTRY OF FINANCE JAPAN, BLOOMBERG INTELLIGENCE. DATA (RIGHT): COMPANY WEBSITES

◀ afford in Manhattan. In June the couple moved into a one-bedroom unit in the new Apex Hudson Riverfront tower, where they pay $2,100 a month, plus $100 for parking. "The apartment is spacious, it's so calming here," says Chilukuri. "If I want to go to a restaurant or something and try a new cuisine, I'll go to Manhattan instead of searching for a restaurant in Yonkers. The train is only five minutes away."

Officials in both towns say they're working to limit the impact of gentrification by creating hundreds of units that would be affordable to the local population. "There's two options here: We stay the way we were, in which case we all lose out," Spano says. "Or, we go out of our way to take advantage of the economics. Bring the millennials here, get the baby boomers that are empty-nesters now who want to live with the millennials, and get that type of activity in this community. We're not displacing anyone, because 90% of everything that's been built has been built on vacant property."

But Cynthia Clarke, a 63-year-old retiree living blocks from Yonkers's new waterfront on a fixed income of $840 a month, is worried. The cost of living is already rising, she says, and she's concerned the owner of her two-bedroom apartment will modernize the building for the next wave. "It's like they're trying to push everybody out," she says. "There's really nowhere to go." —*Prashant Gopal and Vildana Hajric*

THE BOTTOM LINE Commuter towns New Rochelle and Yonkers are working to lure millennials away from New York City to shore up their tax bases and revitalize their downtowns.

Climate Change Primed Chileans For a Revolution

● A long dry period has helped spark a revolt against the neoliberal economic model

Scientists and academics from around the world gathered at Chile's Museum of Fine Arts on the evening of Oct. 18 for the close of a three-day conference on climate change in a nation that's endured a decade-long drought. Under the glass dome of the elegant Beaux Arts building, Stanford researcher Susanne Moser warned in a keynote speech that policies to cool a burning world must foster community or fail.

Outside, demonstrators chanted, burned barricades, and charged at police. It was the beginning of a social explosion that's rocked the South American nation, one exacerbated by the unprecedented dry spell. "It all seemed pretty theoretical until then–transformation, climate change–and then we went outside, and there it was," says Moser, an expert on adaptation and resilience. "It was an awakening, from talking about it to being in it–with the tear gas in your eyes."

The trigger for the demonstrations was discontent with inadequate pensions, health-care, and education systems. Less attention has been paid to the role an extended drought played in priming Chileans for action. Worries about access to water have been bubbling to the surface in a nation that's gone further than almost any other in privatizing an increasingly valuable resource. "The drought left us thirsty for revolution," read a sign at a demonstration in Santiago in October.

During the dictatorship of General Augusto Pinochet, Chile became one of the first countries in the world to cede management of its water utilities to foreign companies. The Pinochet-era Water Code allows water rights to be owned in perpetuity and traded as assets. The framework helped foster the development of the mining, agribusiness, and forestry sectors, but critics say it's privileged the needs of business above those of communities.

The popular consensus in favor of free markets has grown brittle over the course of almost three decades since the end of the dictatorship.

▲ A pier on what used to be Laguna de Aculeo

● Chile

MATIAS DELACROIX/REUTERS

It finally shattered this year, which happens to have been one of the most arid on record. Higher temperatures and record-low river flows forced farmers to abandon crops and leave cattle to die. Taps in dozens of villages ran dry, leaving residents dependent on trucked-in water. "The meteorologists say it rained 8 or 9 millimeters, but we haven't seen any of it," says Pascual Varas, who lives in Chincolco, a village in the Petorca valley about 200 kilometers (127 miles) north of Santiago. A year ago, he had 76 cows and horses; only 30 remain, and he expects to lose more over the South American summer.

Chile isn't the only place where a warming planet has contributed to political strife and social unrest. Just a year ago, French President Emmanuel Macron's plan to increase fuel taxes to fight climate change set off protests that paralyzed Paris and other French cities for months. In Syria crop failures that drove up the price of bread helped trigger a civil war that's killed hundreds of thousands. "The environmental and the social crisis that we are living in Chile, Latin America, and the entire world are two sides of the same coin," says Chilean Minister for the Environment Carolina Schmidt.

From 2010 to 2018, the central region of Chile suffered what scientists call a "megadrought." Among its casualties was the Laguna de Aculeo, a body of water south of Santiago that was once a popular site for water sports. From 2010 to 2017 annual rainfall in the area decreased by half, while water use by farmers and residents in the nearby city of Paine has continued to climb. Aculeo officially ceased to exist as a lake in 2018.

As the nation turned ever drier, citizens became angrier. "Over the past 10 years in Chile, we have seen small explosions that pointed to these underlying tensions," says Anahi Urquiza, an environment and anthropology professor at the University of Chile. Among them was a fight for water in the Petorca valley where, for the past few years, small landholders and cattle ranchers have been accusing growers of avocados, a water-intense crop, of pumping more than allowed from rivers and canals and of digging illegal wells under riverbeds. "Farmers couldn't understand how their fields were drying up while avocado growers were expanding up the mountains in places where only cactus grow," says Rodrigo Faundez, a spokesman for Modatima, a local advocacy organization representing ranchers and small farmers. "Our demand is very simple: We ask the state to stop holding the right to private property above human rights."

Protests in Petorca have intensified in the past two years. At one point, farmers blocked a road linking the province's two main towns with burning cow carcasses. Frustrated residents, who now depend on water that's trucked in, also took to the streets.

Demonstrators' demands for a more equitable distribution of water resonated widely in a country afflicted by growing income inequality. Chile's two biggest cities, Santiago and Valparaiso, were the scene of street protests that in several instances turned violent. The eruptions prompted the administration of President Sebastian Piñera to cancel a meeting of the Asia-Pacific Economic Cooperation forum in mid-November. The government also pulled out as host of the United Nations-sponsored COP25 climate talks, which moved to Madrid.

A broad swath of Chileans has rallied behind the idea that the country's Pinochet-era constitution—a document that enshrines a neoliberal economic model—must be scrapped. A Nov. 22 survey by pollster Cadem measured support for that idea at 85%. Lawmakers have come up with two mechanisms to draft a new charter, and citizens will choose between the two in a plebiscite in April.

"For the first time in 30 years, we have the possibility to redefine the rules of the game," says Urquiza, the professor, who's hopeful some good will come from the process. "This is a country combining a great exposure to climate risks with an incredibly deteriorated environment and little capacity to manage its territory. Altogether, it's a time bomb." —*Laura Millan Lombraña and Sebastian Boyd*

THE BOTTOM LINE In Chile, an extended drought and disputes over access to water helped crystallize support for a rewrite of the Pinochet-era constitution.

"We ask the state to stop holding the right to private property above human rights"

Can Boris Fill in The Blank for the U.K.'s Future?

Winning was the easy part for Johnson. To keep his promises, he faces negotiation after negotiation with very limited time

In the weeks before the Dec. 12 election in the U.K., a team of consultants decided to test a question with focus groups to try to understand the public mood. In a number of marginal constituencies, places where the election would be won or lost for Boris Johnson's Conservatives, participants were given a version of Trump's 2016 campaign slogan: "Make Britain [What?] Again." They were asked to fill in the blank.

The answer that came back most frequently was "normal." Make Britain normal again.

Johnson's resoundingly successful campaign was driven by just these sorts of focus groups. His slogan, "Get Brexit done," perfectly captured the popular despair with gridlock and division. The result: The Conservatives have an 80-seat majority in Parliament, giving him a legislative freedom neither he nor his predecessor, Theresa May, enjoyed

Edited by
Jillian Goodman and
Rodney Jefferson

before. How he uses his power will determine the kind of Brexit—and future—Britain gets.

Brexit would end 46 years of close economic integration with the European Union, so that's not exactly normal. But like Brexit itself, normal can mean different things to different people. For some, it means simply not discussing the B-word at all—preferably ever again. For others, it may mean a return to a time when wages were growing, shopping centers were buzzing, and the country was admired around the world instead of pitied or ridiculed.

"The backdrop to this election was a feeling of gloom and pessimism," says Deborah Mattinson, co-founder of strategy consultant Britain Thinks, which ran the focus groups. Normalcy is about a sense of calm and purpose. "It's more of a mood state than to do with any economic specifics." That, at least, gives Johnson some room to work with.

In the most basic sense, delivering Brexit through Parliament is now straightforward. Johnson is expected to get his terms for the divorce—known as the Withdrawal Agreement—through in short order, which means the U.K. will leave the EU officially by Jan. 31 and enter into a transition period. The hard part, however, is what comes next in the relationship with the EU. "The whole focus in the election was on the next months and getting the Withdrawal Agreement through. That's not a problem anymore," says Jill Rutter, a senior research fellow at a think tank called UK in a Changing Europe. "It's much less clear where he wants to end up long term."

Rutter lists a range of trade-related questions that will have to be sequenced and discussed, all with an eye to other agreements Johnson wants to do, particularly with the U.S. "They'll have to be playing a kind of double game—what can they agree with the EU and what does that do to limit their room for maneuver on other agreements," she says. "Most of these other countries will reckon that the U.K. is not worth spending this time and effort on until it sorts out its relationship with the EU."

Johnson's room to maneuver is limited, that is, if he intends to honor some of the checks he wrote along the way to victory. To appease the hard Brexiters in his own party and win over supporters of Nigel Farage's Brexit Party, Johnson pledged to conclude a trade deal by the end of 2020 rather than take advantage of a provision that allows him to extend the negotiating period by up to two years. Most trade agreements take years to put together; but even assuming both sides lawyer up and sit down in short order, serious negotiations are unlikely to begin before March. That leaves very little time to work out the future of a trading relationship worth more than £648 billion ($856 billion).

Johnson also vowed to give the U.K. maximum freedom to pursue its own rules and regulations post-Brexit, resisting the EU's demands for a so-called level playing field, which include aligning on areas like environmental regulations and state aid. The Union fears that a low-tax, regulation-lite Britain will rise—Singapore-like—from the ashes of Brexit to suck talent and investment away.

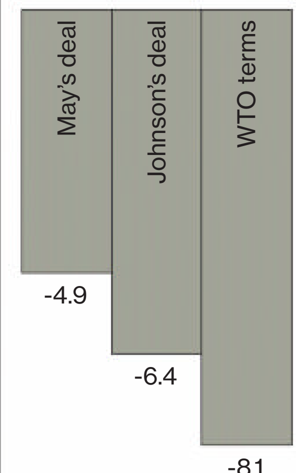
The easy part of a trade deal, relatively speaking, is goods trade. The EU would likely be prepared to remove tariffs and quotas on goods with some commitments on level-playing-field provisions from the U.K. And Johnson may be willing to make some concessions in the name of a quick deal. But zero-tariff trade doesn't mean zero-hassle trade. Customs and regulatory checks impose a new layer of costs. Rules-of-origin requirements—limits on what portion of a good entering from another country must have been made in that country to qualify for zero tariffs (or whatever has been agreed)—could be devastating for a number of British industries, including the auto sector, which contributes £18.6 billion to the economy and supports 168,000 workers.

Raoul Ruparel, May's former special adviser in Europe, notes in a recent paper for the Institute for Government that the data for levels of "local content" isn't even available for many goods. In the existing manufacturing supply chains between the U.K. and the EU, goods can cross borders multiple times before they're complete without any rules-of-origin documentation. How will negotiators even know what to ask for in different sectors without that information?

Then there's services trade, which is generally excluded from trade deals, or barely covered. The U.K. has a trade deficit with the EU in goods, but a £28 billion surplus in services, which accounted for 41% of exports to the Union in 2018. The U.K.'s coveted financial-services sector, which makes up just over half of British services exports to the EU, supports more than a million jobs. The nonbinding political declaration that forms the basis of the future trade negotiations makes only a brief mention of financial services. It's unlikely the EU, which is eager to build up its own financial centers, will concede much on the issue.

Johnson has signaled his determination to stick to a quick exit, even rewriting part of the Withdrawal Agreement Bill to "legally prohibit" a delay beyond the end of next year. That will limit the scope of any agreement and means much of the time will ▶

● Forecast 10-year percentage-point change in U.K. income per capita for each Brexit scenario*



"They'll have to be playing a kind of double game—what can they agree with the EU and what does that do to limit their room for maneuver on other agreements"

PHOTO ILLUSTRATION BY 731. JOHNSON: HOLLIE ADAMS/BLOOMBERG. *FORECASTS INCLUDE IMPACT ON PRODUCTIVITY. DATA: UK IN A CHANGING EUROPE

◀ be taken up with negotiating about negotiation—with little time to hammer out a treaty that covers more than the basics.

The EU will want commitments on access to British fishing waters and level-playing-field provisions, as well as a quick deal on tariffs and quotas. It will also likely insist the U.K. accept restrictions on the use of place names and product descriptions called geographic indications (think Champagne or Parmesan cheese), which may complicate a trade deal with the U.S. The time pressure could result in no trade agreement being done at all.

The trade-offs for Johnson are clear: the faster a deal with the EU, the harder the Brexit—that is, the greater the economic costs. One attempt to project the impact on the country's gross domestic product by Rutter's UK in a Changing Europe concludes income per capita would be 2.5% lower under the deal Johnson has before Parliament than May's rejected proposal. A Bloomberg Economics analysis also suggests the U.K. economy would be smaller under Johnson's Brexit deal compared with any option other than leaving in 2020 with no EU trade deal at all and trade conducted under World Trade Organization terms. The irony is these costs would bite hardest in the northern constituencies Johnson has just won over from the Labour Party.

Nothing Johnson can get will be easily sellable as a great achievement, especially the more people learn about customs and regulatory checks. The political and economic costs of the new customs border along the Irish Sea under Johnson's deal—though he repeatedly refused to acknowledge them on the campaign trail—are another potential source of backlash. (In fact, the greatest hope of a sensible deal for Johnson would be if the entire country simply tuned out the minutiae. It's possible they will.)

Still, the Brexit that comes with a speedy trade agreement, while it would impose medium- and long-term costs, would not be as chaotic as a no-deal divorce. If the only trade deal Johnson can get by 2020 is a de minimis one with few benefits, then he may decide it's easier to bill it as an amicable separation, retain the U.K.'s complete freedom to go its own way, package the split as sovereignty-enhancing, and blame the EU for any hardships. Holding the line on Brexit may also be Johnson's insurance policy for the next election, in 2024, a way to fend off the euroskeptics who will no doubt find something to gripe about, whatever deal is struck.

To be as successful in office as he was campaigning for it—that is, to keep his northern voters on his side in the next election—Johnson will have to deliver both Brexit and tangible change in their lives. So the tougher the economic conditions that result from Brexit, the higher the price Johnson will have to pay out of state coffers to cushion the blow in his new northern heartlands. That may betray his traditional political base—composed of small-government fiscal conservatives who backed the unpopular austerity policies of the past decade.

It will be hard to both dispel distrust and deliver on pledges that relied, in large part, on glossing over the costs ahead. Johnson won his historic parliamentary victory by being shrewdly tactical. For his first big decision after the election, he may instead have to figure on a strategic move: How close a trading relationship with Europe does he really want and how big an economic price is he willing to pay for the separation he promised? In other words, Johnson has to define not just Brexit, but Britain's new normal. —*Therese Raphael, Bloomberg Opinion*

THE BOTTOM LINE Johnson has a more than comfortable majority in Parliament, allowing him to do almost anything he wants about Brexit. The problem is: What does he do now?

Merry Christmas, Mr. Biden!

● Impeachment could turn out to be a gift for the former vice president's campaign in Iowa

Congress will ring in the new year as only it can: with stepped-up partisanship and bitter division, this time in the form of the Senate's impeachment trial of President Trump.

With Republican Senate Majority Leader Mitch McConnell of Kentucky running the show, the chance that Trump will be removed from office is all but nonexistent. Even so, the trial could turn out to be a meaningful factor in the presidential election—not because of its effect on Trump, but because of the wrench it throws into the Democratic primaries.

The trial will tie up five Democratic hopefuls, including two of the front-runners, Bernie Sanders of Vermont and Elizabeth Warren of Massachusetts, going into Iowa's first-in-the-nation caucus on Feb. 3. All the Democratic candidates agree that Trump should be removed from office, so that question on its own doesn't divide the field. But the obligation

to attend the Senate trial means a good number of the candidates will be absent from Iowa in the critical weeks before the caucus—at least during the workweek—when they'd rather be making their closing pitch. That could be a particular setback for Amy Klobuchar of Minnesota, who's recently been gaining momentum. Meanwhile, Joe Biden, Pete Buttigieg, and other non-senators will have the state to themselves while their rivals are stuck on Capitol Hill.

"The last place I'd think the senators running for president would want to be in the weeks before the Iowa caucuses is tethered to their desks in the Senate, silently serving as jurors in an impeachment trial, the outcome of which we already know," says David Axelrod, Barack Obama's former chief strategist. "Iowans want to see the candidates to close the deal, and I would think all of them are frustrated by the prospect of missing this crucial time in the calendar."

How a high-profile impeachment trial changes sentiment among Iowa Democrats is anybody's guess. Big news events in the recent past have generally had the effect of freezing the field, but that provides little predictive clarity. The most recent poll in the state, released on Dec. 10 by WHDH 7News/Emerson College, found Biden (23%), Sanders (22%), and Buttigieg (18%) clustered at the top within the margin of error (+/- 5.4%). The RealClear Politics Iowa polling average favors Buttigieg (22.5%), Sanders (19.3%), and (Biden 18%), with Warren (16.3%) in striking distance.

One irony of the impeachment saga has to do with its origin in Trump's attempt, through Ukraine, to impugn and weaken Biden, a likely general election rival. So far, the former vice president's stature among Democrats hasn't fallen. In fact, as the trial gets rolling, it's Biden's key rivals with day jobs in the Senate who will likely incur a cost. At least in Iowa, that could wind up giving him a small—but perhaps decisive—advantage. —*Joshua Green, with Sahil Kapur*

Michael Bloomberg, founder and majority owner of Bloomberg LP, Bloomberg News' parent, is seeking the Democratic presidential nomination.

THE BOTTOM LINE Rather than reverse Biden's momentum, Trump's attempt to dig up dirt on him may have given the former vice president an electoral boost, at least in the short term.

The Chancellor Stays In the Picture

● For Angela Merkel, the chances of remaining in charge are less bad than before

Angela Merkel's future has caused Germany much angst. Her own Christian Democrats (CDU) spent much of last year in turmoil over who should succeed her at the end of her expected 16-year reign as chancellor. Then this month, her junior coalition partner, the Social Democrats (SPD), elected a duo of leftist leaders who question key tenets of the CDU's governing philosophy.

None of this looks great for Merkel. And yet the 65-year-old former physicist remains hugely popular, both inside and outside the country. Much of the political establishment in Germany and Europe wants a seasoned leader in charge when Berlin assumes the presidency of the European Union in the second half of 2020. And Merkel herself has said she doesn't want to go anywhere. Despite appearances to the contrary, the chancellor is well-positioned to ride out the next two years in whatever way she wants.

For one, the CDU and its sister party, the Christian Social Union (CSU) in Bavaria, could still work out a revised coalition agreement with the SPD. Should that fail, Merkel faces two possible scenarios: snap elections, or, more likely, governing in the minority. Parliament already approved the 2020 budget, and she still has support there from more moderate SPD lawmakers and from the Greens, who are weighing a potential future alliance with the CDU, which would give her room to maneuver even without a majority.

Despite the energy coming from the formerly sidelined socialist wing of the party, the SPD is hardly negotiating from a position of strength. At the party convention in early December, it saddled its new leaders with a list of concessions to extract from Merkel as a condition of their remaining in government, including a 30% increase ▶

BLOOMBERG (7)

◀ in the minimum wage and significant new public investment.

The CDU and CSU have already signaled they're in no mood to bend to the party's demands—CSU caucus leader Alexander Dobrindt has already called the SPD agenda a "warmed-up box of socialist moth balls" and said that under no circumstances would the coalition partners renegotiate their agreement from March 2018. A final reckoning is still a long way off: Talks won't begin in earnest until after the yearend holidays, and then it could be weeks more before the parties make or break a deal.

To dissolve parliament and call new elections would require the approval of the president, and short of a highly unusual attempt by parliament to install another chancellor, Merkel would have to propose and lose a confidence vote. For a stateswoman of her stature to bring about her own downfall would be unthinkable, says Andrea Römmele, professor of political communication at the Hertie School, a Berlin-based university. "To go down in the annals of history like that—I don't see it," she says.

There are reasons why the status quo may prevail. The SPD has been losing support for years, and abandoning the government would amount to potentially damaging losses in a snap election. Based on recent opinion polls, the party's parliamentary caucus could shrink by as much as 30%. Plus, "in the long-run, Germany can't afford a minority government," says Michael Grosse-Brömer, the CDU/CSU whip. "As a strong industrial nation in the middle of Europe it must be capable to act."

While Germany hasn't been immune to the rise of the populist, green, and other movements that have splintered Europe's political spectrum, Merkel is a potent reminder that the center still holds. Weak leadership in Berlin could hamper a response should the economy—Europe's largest—turn south. The country just barely avoided a recession in the third quarter, and though growth is expected to bounce back at the end of the year, the central bank cut its 2020 GDP forecast from a 1.2% expansion to just 0.6%.

With pillars of the post-World War II order from NATO to the World Trade Organization under fire, the departure of one the most outspoken defenders of multilateralism could have far-reaching implications. "If one day she isn't around anymore," Grosse-Brömer says, "many will miss her."
—Raymond Colitt, with Arne Delfs

THE BOTTOM LINE While there are many scenarios in which Merkel could stay in power, few involve a strong, stable government in Berlin.

Wexit Wishes In Western Canada

● Taking cues from Quebec and Brexit, some Albertans consider breaking away

It's not just the Quebecois who sometimes imagine themselves breaking away from Canada. Ever since Liberal Justin Trudeau was reelected as prime minister in October, a small but vocal group in the oil-rich province of Alberta has worked to rally support for seceding from the country.

The so-called Wexit movement, named for Alberta's location in Western Canada and inspired by the U.K.'s separation from the European Union, was on display at a November rally in Calgary, where most of Canada's energy companies are based. The event drew about 1,700 people, some wearing hats emblazoned with "Make Alberta Great Again" and "WEXIT." Speakers, including the movement's co-founder Peter Downing, addressed local frustrations, painting a picture of an independent Alberta flush with cash, freed of the burden of federal taxes, and driven by a booming oil industry no longer restrained by regulations imposed by eastern elites.

Calgary was a stop on Downing's post-election tour. He and others in his organization, which includes local businesspeople and activists, have drawn crowds in Edmonton and Red Deer. In just two months, they've managed to harness the region's simmering resentments and turn them into a roiling movement. According to an Abacus Data poll conducted in the week leading up to the Calgary rally, about 25% of Albertans would vote in favor of separation—less than half the support it would need to put separation proceedings in motion, but enough to make it more than just a fringe concern.

▲ On sale in Calgary

Kimball Daniels, a 54-year-old who works in the construction industry, says he's long thought about whether the province should separate from Canada, but Trudeau's reelection helped

him make up his mind. “It’s taxation without representation, simple as that,” Daniels said while waiting for the rally to get underway. “They take our money, and we have no say in it.”

Alberta contributes disproportionately to federal coffers, paying about C$5,096 more in taxes per capita than it received in government spending in 2017. By contrast, Quebec received C$1,958 more than it paid. (Alberta also has a higher per capita gross domestic product than does Quebec.)

Crucially, the separatists have yet to deliver a robust explanation of how Alberta would be better off as a landlocked, oil-focused nation in a world moving away from carbon-based fuels. They say that an Alberta freed of Ottawa’s influence could forge better trade relations with the U.S., though that assumes the country will continue to be under the control of an oil-friendly Republican administration.

The group has filed to become an official political party and will focus on electing candidates to push its agenda in Ottawa, Downing said. One of its primary targets is Jason Kenney, Alberta’s Conservative premier, who’s already created a provincial panel to consider such measures as withdrawing from Canada’s federal pension system, establishing Alberta’s own police force, and opting out of some federal cost-sharing programs. So far, he’s held out against holding a provincial vote on secession. “If he’s not going to give us our referendum, get out of the way,” Downing said, as the Calgary crowd cheered. “You’re going to be replaced.”

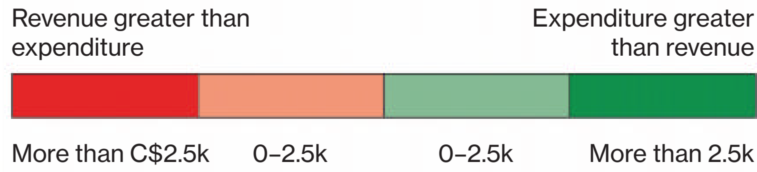
Trudeau addressed western Canadian alienation in a news conference shortly after his election, but added pointedly that solving the country’s problems is “going to take all Canadians sticking together, helping out folks who are struggling in places like Alberta and Saskatchewan.”

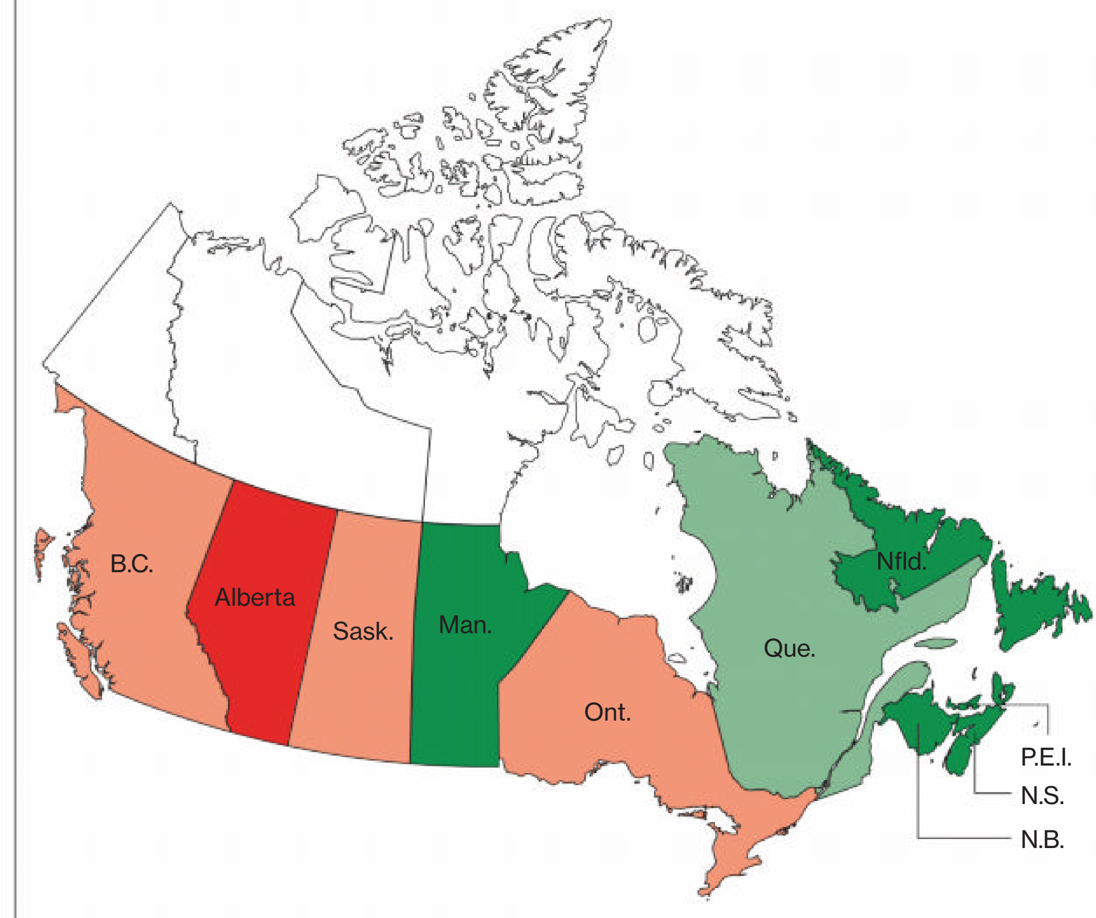
While splitting Alberta from the rest of Canada is unlikely, Wexit has helped make the province’s grievances a national priority. Trudeau last month appointed Jim Carr, a member of Parliament from Winnipeg and a former minister in his cabinet, as an adviser on western Canada. He also named Chrystia Freeland, his Alberta-born former foreign affairs minister, to the role of deputy prime minister, giving her latitude to work on soothing western alienation.

Brett Wilson, an entrepreneur and former judge on the Canadian business show *Dragon’s Den*, says that while he doesn’t necessarily want Alberta to separate from Canada, the Wexit movement strengthens the province’s hand in its dealings with Ottawa. “I’m having trouble finding anyone who says, ‘No, no, our current deal is fair,’” Wilson says. “What all of us want, and I think everybody at the table wants, is a deal that feels fair and is fair.”

Another key to subduing the separatists’ ire will be reviving Alberta’s oil industry. It was deeply wounded by the 2014 oil price crash, and growth has been hampered as pipeline capacity has failed to keep pace with production increases. Alberta’s unemployment rate has remained stubbornly high the past four years—clocking in at 7.2% in November, compared with 5.9% for the country as a whole—as the inability to expand keeps workers idle. Still, Alberta accounts for about 17% of Canada’s gross domestic product. “If we just turn the taps off, it’s going to make the East start asking us to help them out,” said Madison Lepard, a 28-year-old lawn maintenance worker, at the Wexit rally. “We’d be just fine on our own.” *—Kevin Orland*

Difference between federal revenue per capita and expenditure per capita by province in 2017





DATA: PARLIAMENT OF CANADA

THE BOTTOM LINE The Wexit movement is still small, but it’s making its presence felt at home and in the capital by playing on Albertans’ existing grievances.

The Prodig

Masayoshi Son is known for making outsize bets on tech startups. But current and former employees of SoftBank describe a culture of recklessness, sycophancy, and harassment

al Son

By Sarah McBride, Gillian Tan, Giles Turner, Peter Elstrom, Pavel Alpeyev, and Brad Stone

Every six weeks or so, the SoftBank Vision Fund, the biggest source of investment money flowing to Silicon Valley, convenes a multi-hour video conference call for 75 people on three continents to catch up on its startups. Masayoshi Son, the Japanese billionaire and founder of the fund's parent company, SoftBank Group Corp., usually dials in from Tokyo. Masa, as Son is universally known, can be charming and effusively complimentary on the calls, according to three regular participants. Or he can be enraged, berating presenters and demanding a perpetually shifting yet unfailingly detailed set of metrics. Or he can be both. No one ever quite knows where he'll land on the charm-rage axis.

On one call in 2018, the three participants say, a Vision Fund managing partner named Kentaro Matsui was presenting charts showing steady but slow progress from the Chinese shipping startup Full Truck Alliance. Son flipped into rage mode, criticizing Matsui for being too conservative and demanding that he accelerate projections for revenue and valuation growth. "You're too much like a banker!" he snapped at Matsui, who's in fact a former banker. Others on the call cringed. It seemed as if Son was demanding that Matsui should find a way to supercharge the startup's trajectory—a potentially dangerous push. "If you don't change, I'll find a way to change your role!" Son said.

That's the thing about Son: Whichever approach he chooses, the point is always to go big or go home. This attitude has been a differentiating feature of his Vision Fund since it landed in Silicon Valley three years ago. It identifies a startup to invest in, pushes its founders to expand aggressively, and profits from ballooning valuations. The method seemed to be working—at least until earlier this year, when the fund's most prominent investment, the office-sharing startup WeWork, operatically self-destructed.

Another feature that sets the Vision Fund apart is where the biggest chunk of its money comes from: Saudi Arabia. Son raised $45 billion from the Saudis despite international scrutiny of their human-rights record. Crown Prince Mohammed bin Salman backed the Vision Fund in 2016, not long before he detained hundreds of the kingdom's leading businessmen and government officials at the Ritz-Carlton Riyadh. According to media reports, detainees were tortured; one, a Saudi general, died

No one "wants to pick a fight with a crazy guy"

in captivity. The following year, bin Salman was implicated by the CIA and the United Nations in the assassination and dismemberment of a U.S.-based journalist for the *Washington Post*, Jamal Khashoggi. (Bin Salman has denied the accusations.)

Son ignored the controversy, other than an acknowledgment at the start of his November 2018 earnings presentation. In other public appearances, he stuck to his usual shtick, which is to make grandiose prognoses. He's a big proponent of the singularity, the mythological crossover event when artificial intelligence overtakes human intelligence. "Every industry that mankind created will be redefined," he proclaimed in a 2017 speech. Few in Silicon Valley take Futurist Masa seriously. (A PowerPoint presentation for his company's 300-year plan included a robot passing a cartoon heart to a human with the words "Information Revolution - Happiness for everyone.") And yet everyone, it seems, has been happy to take SoftBank's money.

In 2017 the Vision Fund made more than $21.2 billion in investments in 19 companies, including committing $4.4 billion to We Co., the parent of WeWork. Outsiders were skeptical of Son's outsize capital. "The only other time we saw that kind of money come into the tech industry was 1999, 2000, and that ended badly," says Steven Kaplan, co-founder of the entrepreneurship program at the University of Chicago Booth School of Business.

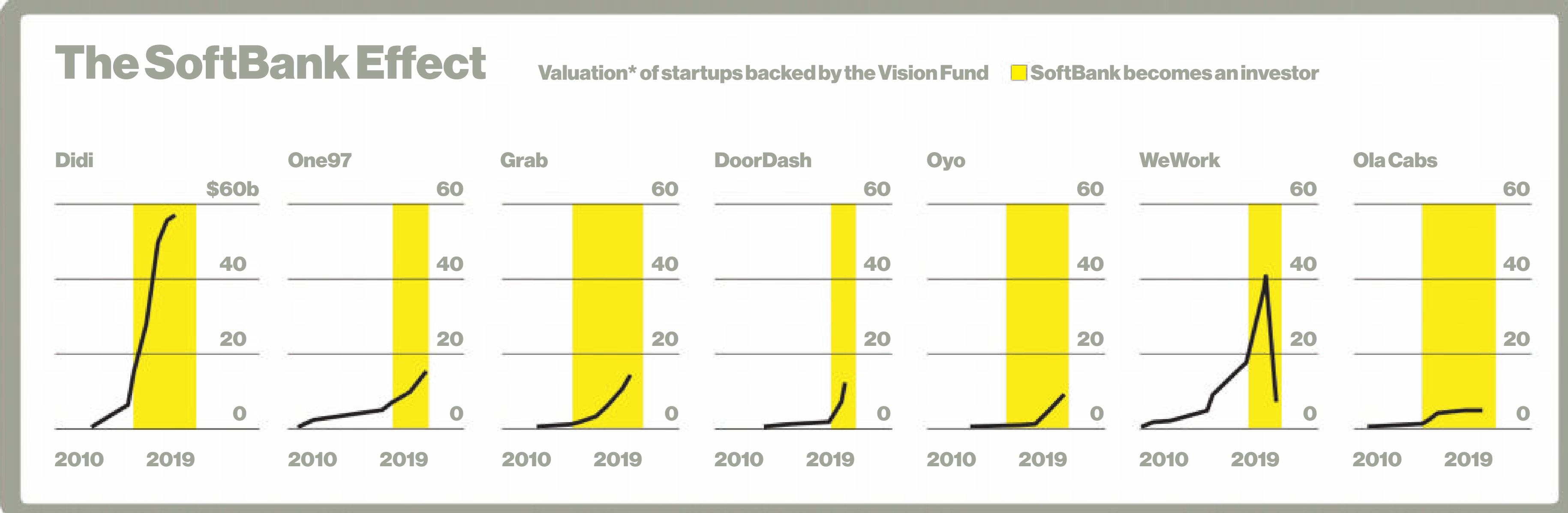
The strategy that Son and his all-male phalanx of managing partners followed seemed less about any specific technology than about placing large bets on the buzziest startups: WeWork ($10.7 billion), Uber ($7.7 billion), on-demand pizza maker Zume ($375 million), and dog-walking app Wag ($300 million). They invested in a few hardcore artificial intelligence companies, too. Portfolio companies expanded quickly, often haphazardly, leading to a collection that included high-profile disappointments and the conspicuous disaster at WeWork. SoftBank's starry-eyed investors convinced themselves that WeWork's outrageous operating losses and the erratic behavior of co-founder Adam Neumann didn't matter—until potential public-market investors reminded them that, actually, they did.

And the Vision Fund's problems don't stop with some bad bets. Current and former employees of the fund and SoftBank describe an environment of sycophancy toward Son, internecine political rivalries, harassment, compliance issues, and an abnormally high tolerance for risk—all wrapped in a casing of general weirdness.

Raised in Japan by a middle-class Korean family, Son made a fortune investing in technology in the 1990s. He briefly surpassed Bill Gates as the world's wealthiest person, lost almost everything in the dot-com crash, then won it all back. In 2000 he invested $20 million in the Chinese e-commerce company Alibaba Group Holding Ltd.; his stake is now worth more than $130 billion. His mostly successful track record led him to announce the $100 billion Vision Fund in 2016.

Son likes to say that the fund reflects his belief that startup clusters can pattern themselves after *gunsenryaku*, the Japanese term describing the cooperative behavior of migrating birds. Several portfolio companies, including Mapbox (digital mapping) and Fungible (data services), describe partnerships with another company, ARM (chipmaking), that would have taken much longer to forge without SoftBank's nudging. DoorDash is deploying technology from GM Cruise (autonomous vehicles) as it tests self-driving cars for food delivery. Fanatics (sports apparel) is working with South Korea's Coupang (e-commerce) as it expands into that country. Katerra (modular construction) recently struck a deal to build a headquarters for India's Paytm (payments).

But the real strategy behind the Vision Fund seems to involve another Masa principle: Big money means big



strategic advantages. The idea is that festooning entrepreneurs with hundreds of millions of dollars and urging them to spend at an exorbitant pace will scare off competitors and allow the Vision Fund to mint behemoths. No one "wants to pick a fight with a crazy guy," he told *Bloomberg Businessweek* last year.

Many SoftBank-backed founders have Masa stories. These often begin with a summons to the 26th floor of SoftBank's green-tinted glass headquarters in Tokyo or to Son's home in Woodside, Calif., a 74-acre compound whose massive main residence features a foyer with a large marble statue of a horse and chariot. The entrepreneur might then sit across a table from Son, answer a few questions, hear that their idea is even more promising than they thought, and, by the end of the conversation, be anointed "the next Jack Ma."

"You feel enabled, you feel euphoric," says a chief executive officer in Asia. "You've been told no a hundred times, and then he says he believes in you. Every entrepreneur dreams of having that kind of backing."

One Silicon Valley CEO recalls an early pitch meeting with Son over video chat. Unbeknownst to the CEO, the feed to Tokyo fell a minute behind the audio, so he was narrating slides SoftBank's top brass weren't yet seeing. "They were all superpolite and nodding their heads," said a person with knowledge of the meeting, who wasn't authorized to discuss it. "I didn't find out until after that none of it made any sense." The fund ultimately invested in the late-stage startup.

Vision Fund portfolio companies sometimes seem to suffer from an overabundance of vision. Until Dave Grannan, co-founder and CEO of Light Labs Inc., a camera startup in Redwood City, Calif., met with Son in Tokyo and then again in Woodside in early 2018, he hadn't considered developing his imaging technology into a new way for autonomous vehicles to navigate. "That idea came directly from Masa," he said in an interview last year. The concept helped Light get $121 million in funding in July 2018, with SoftBank leading the way. As was customary with many of its investments, the capital would come in tranches, with subsequent funds dependent on meeting sales and growth targets. Light pivoted to the autonomous car market, as Son had advised. About half of Light's employees were laid off in July, when the company eliminated its original smartphone-camera technology to help stem losses.

After Vision Fund invested $375 million in Zume Pizza Inc., whose mission to use robots to automate pizza making had shades of Silicon Valley frivolity, CEO Alex Garden expanded his mission to include rethinking the entirety of U.S. food production. Employees were unnerved. "Are we the next Theranos?" went one anonymously submitted question at an all-hands meeting over the summer. Afterward, Zume banned anonymous questions at the meetings. (A spokesman says the company has always "strived for transparency" and has a different way for employees to submit anonymous questions.) Three months later, Zume has yet to revolutionize food production or to be profitable.

Misra

The Vision Fund's nearly 500 employees operate from traditional office towers around the world, but most of its executives work from a townhouse in London that was once home to the Ladies Empire Club, a defunct women's organization. Son hasn't visited the headquarters in two years, according to several people close to the firm.

To lead the fund's unicorn hunt, Son brought in Rajeev Misra, a veteran Wall Streeter who once ran the Deutsche Bank subprime team immortalized in *The Big Short*. At the office, Misra favors dark designer sport coats with pocket squares and bare feet or furry Gucci slippers, and he often vapes at business meetings. He filled his investing team with fellow bankers from Deutsche Bank AG and Goldman Sachs Group Inc. While it was placing its startup bets, SoftBank Group also executed complex investments in public companies, including taking a roughly $3.7 billion stake in Charter Communications Inc. in early 2018 and offloading it a year later after the share price rose by more than a third. A giant, convoluted bet on U.S. chip designer Nvidia Corp. brought in a $2.8 billion gain.

During all that adroit dealmaking, the fund's workplace culture was steeped in vintage Wall Street macho belligerence. In early 2017 the Vision Fund's Zambia-born chief financial officer, Navneet Govil, told a Mormon employee to "go back to Utah to get more wives." The employee left the company. Via a spokesman, Govil denies making such a statement. Around that time, Govil also berated a young accountant in front of a group, bringing her to tears. She later quit. And at a work lunch a few months later with several colleagues, Govil remarked that "Chinese people sound stupid," according to two people who heard the comment. Via a spokesman, Govil denies making such a statement or berating the employee; SoftBank says it has no record of these events.

In Silicon Valley, much of the whispering about SoftBank's peculiarity and spotty investment record concerns managing partner Jeff Housenbold, who collects cars, including a blue Ferrari, and claims to own a 20,000-bottle wine cellar, although he doesn't drink

PREVIOUS SPREAD: PHOTO: TOMOHIRO OHSUMI/GETTY IMAGES. THIS PAGE: PHOTOGRAPH BY MATTHEW SCOTT FOR BLOOMBERG BUSINESSWEEK.
DATA: CRUNCHBASE, BLOOMBERG, SOFTBANK. *VALUATIONS ARE POST-MONEY, OR INCLUDING THE AMOUNT INVESTED IN EACH FUNDRAISING ROUND.

himself. Acquaintances describe him as smart and arrogant and almost entirely lacking in self-awareness. They say he believes himself the epitome of New York City straightforwardness, which doesn't necessarily play well in passive-aggressive California.

He's also gotten away with some questionable behavior. In a discussion about whether to invest in the stationary bike startup Peloton Interactive Inc. in 2017, according to two people who were in the meeting, Housenbold opined that its exercise equipment appealed in part to men who masturbated to its workout videos. SoftBank said Housenbold never made such a comment, and the Vision Fund ultimately did not invest in Peloton. Housenbold is also notorious for sparking an internal compliance review this April by selling personal shares in Guardant Health, a cancer-detection company in which SoftBank is the largest shareholder. Although he was cleared of any wrongdoing and the compliance process was reconfigured so trading in restricted companies is now escalated for human review, some Vision Fund executives were shocked that Housenbold didn't face any repercussions.

Housenbold's investments include several promising portfolio companies, including storage company Clutter and Colombian delivery company Rappi, but at least two high-profile bets have struggled. Wag, which has floundered because of a scarcity of pet owners willing to stick with the dogwalking app, shed CEO Hilary Schneider and bought back SoftBank's stake earlier this month. Housenbold also pushed Tina Sharkey, co-founder of online retailer Brandless Inc., to build a warehouse and distribution network, then forced her to resign and withheld a second tranche of funding when sales disappointed. The board later decided it didn't need the funding after the company moved to a new business model.

At a portfolio meeting in October, Housenbold defended his performance by arguing he'd been trying to back female CEOs. Then he seemed to blame the #MeToo movement for limiting his ability to maneuver, bewildering at least one attendee. A SoftBank spokesperson denied he made such a comment.

Brian Wheeler, general counsel at SoftBank Investment Advisers, says, "The employees involved categorically denied these alleged events ever took place" and that SoftBank has "zero tolerance for any form of harassment or discrimination–it simply has no place in our organization."

Misra, for his part, calls Housenbold "a valued teammate and one of my top performers." More broadly he acknowledges the company has made some bad bets and suffered growing pains. But he notes that in two and a half years, the Vision Fund has invested $76.3 billion in capital and hired hundreds of investment professionals and support staff. "We are very proud of what we have achieved," he says. "Did we make mistakes? Yes. And we continue to learn from them."

If the company is, in fact, learning from its mistakes, it will soon have a doctorate in WeWork. That fiasco can't be attributed to internal chaos or cultural issues at SoftBank. It was all Son's doing.

He was bewitched by Neumann, just as he'd once been by Alibaba's Ma and Yahoo's Jerry Yang. He ignored his advisers, who argued that rival office-sharing companies were offering far better investment terms, and instead followed his usual pattern, showering WeWork with money, demanding frantic growth, and driving valuations higher. Son's first investment was in 2017, at a $20 billion valuation. Then, during a funding round earlier this year, he pushed WeWork's value as high as $47 billion, more than doubling the worth of a money-losing company whose CEO bonded with employees and prospective partners by drinking tequila shots and smoking marijuana.

By the fall, when Wall Street roundly rejected WeWork's planned initial public offering, SoftBank Group and the Vision Fund owned 29% of the company. SoftBank was forced to buy a majority stake in it via a lifeline of cash, equity, and debt refinancing and install one of its own top executives, former Sprint Corp. CEO Marcelo Claure, as executive chairman. "Masa picked the wrong company," says a person close to Son. "He didn't listen to the people who were pushing back. He knows he made a mistake."

Son has been uncharacteristically humble about the disaster. "There was a problem with my own judgment. That's something I have to reflect on," he said at a recent press conference in Tokyo. An investor present at a Vision Fund gathering in Pasadena, Calif., says Son was careful to emphasize such phrases as "corporate governance" and "a road map to cash flow" as he showed abstract slides of rough seas alongside charts that vaguely illustrated WeWork's path to profitability. "Masa wasn't like this before," the investor says.

For investors and analysts who cover SoftBank, a public company listed on the Tokyo stock exchange, the question is whether the hit Vision Fund took from WeWork, combined with its other mistakes and operating structure, have left it vulnerable. The one-third decline in Uber Technologies Inc.'s value since its IPO in May, for example, has observers worried about SoftBank's large stakes in ride-sharing competitors such as Didi Chuxing in China, Grab Holdings in Southeast Asia, and Ola Cabs

“He didn’t listen to the people who were pushing back”

in India. And about $40 billion of the Vision Fund consists of preferred stock that pays outside investors 7% in guaranteed interest annually on their committed capital, leaving SoftBank on the hook if the fund’s bets don’t pan out. SoftBank’s own $28 billion commitment is entirely equity, giving it both more potential upside and more potential downside. “The fund was designed for more profit if everything goes well, but if things go south it’s horrible,” says a former executive who left after growing wary of the company’s position.

Another source of concern is Oravel Stays Pvt. Ltd., better known as Oyo, an Indian startup founded six years ago by Ritesh Agarwal, then 19, to bring order to the country’s anarchic lodgings industry. Oyo offered small, regional hoteliers standardized furniture, bedding, and guaranteed room bookings for a 25% cut of sales. The Vision Fund invested $250 million in 2017 and an additional $1 billion infusion in 2018, pushing Oyo’s valuation to $5 billion. True to form, Son pushed Agarwal to expand, moving into China and the U.S., which have entrenched and less-fragmented hospitality industries. Oyo even bought a few properties outright, including the Hooters Casino Hotel in Las Vegas, hanging its red signs in a market where they were entirely unfamiliar to potential guests.

SoftBank’s investment in Oyo also demonstrates an accounting practice that worries investors. When the fund takes a stake in a startup, then invests again at a higher valuation, it often books a profit on its original holding. This is legal, even though no actual cash has flowed into its coffers. Much of the Vision Fund’s profit in the second quarter of 2019, for example, was on paper, the result of valuation spikes for Oyo, DoorDash, and communications appmaker Slack Technologies. “It may pass the accounting standards test, but it doesn’t pass the common sense test,” says Aswath Damodaran, a professor of finance at the New York University Stern School of Business and author of four books on valuing businesses.

In October, Agarwal and the Vision Fund plowed an additional $1.5 billion into Oyo, doubling the company’s valuation, to $10 billion, in the span of a single year. Agarwal, now 26, financed his purchase by borrowing money from financial institutions including Japan’s Mizuho Bank, and Son personally guaranteed the loans, according to people familiar with the deal. Neither the loans nor the guarantee were disclosed to SoftBank shareholders. Two other SoftBank companies, Grab and Didi, had also invested in Oyo. In other words, SoftBank companies and founders were investing in other SoftBank companies, at times with debt backed by SoftBank. Govil, the CFO, notes that SoftBank didn’t mark a profit from WeWork’s valuation commensurate with its $47 billion valuation, and similarly didn’t book a profit on Oyo to match its valuation rising to $10 billion. Eric Schiffer, CEO of Patriarch Organization, a private equity fund in Los Angeles, derides these financial maneuvers as “unicorn porn.”

SoftBank executives say they have a rigorous process for setting valuations and that the values are determined in conjunction with other sophisticated, independent investors, including Sequoia Capital and Toyota Motor Corp., and vetted by auditors such as Deloitte & Touche. Govil says, “Our valuations have been validated by more than 120 sophisticated investors who have invested alongside and after us. More broadly, our investing has helped create thousands of jobs and spur global growth.”

Masa has been convening his top people to discuss the company’s missteps. One such meeting, at Son’s Woodside compound, featured a tasting session with lettuce and kale from Plenty, a SoftBank-backed vertical farming startup. The produce was judged on “flavor notes and mouthfeel and finish,” says one managing partner who attended.

Misra seems more than ready for the fund to move on. At SoftBank’s offices in San Carlos, Calif., he talks up the $9.9 billion the Vision Fund has already returned to its investors, as well as the billions of dollars of public stock on its books. He points out that in two years, the Vision Fund has had eight IPOs and two acquisitions of its portfolio companies, and says it has $11.4 billion in cumulative investment gains. And it’s not as if its deep-pocketed investors—the Saudis, Apple, Foxconn, SoftBank itself—need their funds repaid anytime soon. “All great news for a fund that’s only 2½ years old,” Misra says between vapes.

There will be even better opportunities to invest in the coming year, he predicts, what with the oceanic opportunities for disruption being ushered in by AI. That’s why his team is assembling Vision Fund 2. They hope the Saudis are in again, along with the Mubadala Investment Co. of Abu Dhabi. None of Son’s people will say exactly how big 2 will be, but they’ve hinted it could be every bit as big as 1. —*With Ian King*

PHOTO: KIYOSHI OTA/BLOOMBERG

The hacker who brought down Liberia's internet wasn't a Russian or Chinese agent. He was a capitalist

By Kit Chellel
Illustrations by
Viktor Hachmang

The attack against Liberia began in October 2016. More than a half-million security cameras around the world tried to connect to a handful of servers used by Lonestar Cell MTN, a local mobile phone operator, and Lonestar's network was overwhelmed. Internet access for its 1.5 million customers slowed to a crawl, then stopped.

The technical term for this sort of assault is distributed denial of service, or DDoS. Crude but effective, a DDoS attack uses an army of commandeered machines, called a botnet, to simultaneously connect to a single point online. This botnet, though, was the biggest ever witnessed anywhere, let alone in Liberia, one of the poorest countries in Africa. The result was similar to what would happen if 500,000 extra cars joined the New Jersey Turnpike one morning at rush hour. While most DDoS attacks last only moments, the assault on Lonestar dragged on for days. And since Liberia has had virtually no landlines since the brutal civil war that ended in 2003, that meant half the country was cut off from bank transactions, farmers couldn't check crop prices, and students couldn't Google anything. In the capital of Monrovia, the largest hospital went offline for about a week. Infectious disease specialists dealing with the aftermath of a deadly Ebola outbreak lost contact with international health agencies.

Eugene Nagbe, Liberia's minister for information, was in Paris on business when the crisis began. He struggled to marshal a response, unable to access his email or a reliable phone connection. Then his bank card stopped working. On Nov. 8, with hundreds of thousands of people still disconnected, Nagbe went on French radio to appeal for help. "The scale of the attack tells us that this is a matter of grave concern, not just to Liberia but to the global community that is connected to the internet," he said. The onslaught continued. No one seemed to know why, but there was speculation that the hack was a test run for something bigger, perhaps even an act of war.

Then, on Nov. 27, Deutsche Telekom AG in Germany started getting tens of thousands of calls from its customers angry that their internet service was down. At a water treatment plant in Cologne, workers noticed the computer system was offline and had to send a technician to check each pump by hand. Deutsche Telekom discovered that a gigantic botnet, the same one targeting Liberia, was affecting its routers. The company devised and circulated a software fix within days, but the boldness and scale of the incident convinced at least one security researcher that Russia or China was to blame.

When the botnet took down the websites of two British banks, the U.K. National Crime Agency got involved, as did Germany's BKA, with support from the U.S. Federal Bureau of Investigation. German police identified a username, which led to an email address, which led to a Skype account, which led to a Facebook page, which belonged to one Daniel Kaye, a lanky, pale, 29-year-old British citizen who'd been raised in Israel and described himself as a freelance security researcher.

When Kaye checked in for a flight to Cyprus at London's Luton Airport on the morning of Feb. 22, 2017, he triggered a silent alarm linked to a European arrest warrant in his name. He was in line at the gate when the cops arrived. "That's him!" an officer said, and Kaye felt hands grab him roughly under the arms. He was taken to a secure room, where officers searched him and found $10,000 in a neat stack of $100 bills. Afterward they drove him to a nearby police station and locked him up. That was until Kaye, a severe diabetic, began nodding in and out of consciousness, then collapsed in his cell. He was rushed to a nearby hospital, where two police officers stood guard outside his room just in case their prisoner managed to overcome his hypoglycemic coma and escape.

But Kaye was no Kremlin spy or criminal mastermind, according to court filings, police reports, and interviews with law enforcement, government officials, Kaye's associates, and Kaye himself. He was just a mercenary, and a frail one at that.

Growing up, Kaye showed few signs that he would one day be one of the world's most wanted hackers. Born in London, he moved to Israel with his mother at age 6, when his parents divorced. In the suburbs outside Tel Aviv, he learned Hebrew, played basketball, and collected soccer cards. A diabetes diagnosis at age 14 limited his social life, but by then Kaye had found a much bigger world to explore online.

He taught himself to code, devouring all the training material he could find, and became a regular on the web forums where young Israelis gathered to boast about their hacking exploits. His alias was "spy[d]ir," according to Rotem Kerner, an online friend from those days. They were "just kids curious about technology and how you can bend it," Kerner says.

In 2002 a forum user called spy[d]ir posted a screenshot of an Egyptian engineering firm's website, defaced with the message: "Hacked By spy[D]ir! LOL This Was too Easy." Over the next four years websites throughout the Middle East got similar treatment. The homepage of a Beirut karaoke bar was tagged with a Star of David. When an Iranian leather retailer was hit, spy[d]ir shared credit with a group called IHFB: Israeli Hackers Fight Back. Kaye, a teenager at the time, denies he was spy[d]ir. But he admits he used online aliases including Peter Parker, spdr, and spdrman, all references to another unassuming young man with hidden gifts.

By that time, Kaye says, he'd graduated from high school and decided to forgo university in favor of freelance programming. He was smart but easily bored, and the internet seemed to offer unlimited challenges and possibilities. Yet translating his love of puzzles and pwnage into paying gigs soon took him into sketchier territory.

Generally speaking, hackers fall into one of a couple of varieties. Black-hat hackers are spies, crooks, and anarchists. White hats hack legally, often to test and improve a client's defenses. And then there are gray hats, who aren't

“I need quite a lot more power”

chaos agents like the black hats but don’t follow the white hats’ strict ethical codes, either. “A gray hat is just told, ‘Get the job done, and you get paid,’” says Theresa Payton, a former White House chief information officer who now runs Fortalice Solutions LLC, a cybersecurity consulting firm. “They don’t have a rule book.”

Kaye inhabited this quasi-legal world, working for private clients who heard about him through hacking forums or word-of-mouth. He also applied for straight jobs, but his demeanor put employers off. While he was thoughtful and soft-spoken, there was a “black cloud around him,” says Avi Weissman, founder of an Israeli cybersecurity school, who considered working with him. Kaye was awkward in person, with a pronounced squint and a way of answering questions that made it seem like he was hiding something.

In about 2011, Kaye was a finalist for a job at RSA Security LLC, a large American cyberdefense company with offices in Israel, but was rejected because of unspecified human resources concerns. Kaye told himself it was for the best. Corporate life didn’t appeal to him. Now in his 20s, he relished his freedom, working through the night when he needed to and hanging out with his friends in bars when he didn’t.

His adventures in the online underworld carried risks. In 2012, Israeli police questioned him in connection with an investigation of a gray-hat acquaintance. Kaye was released without charge. That year he decided to move to London. He’d just proposed to his girlfriend, a former university administrator who moved to Israel to be with him. She wanted to pursue her career in the U.K., and he wanted a fresh start.

Anthony Zboralski, a hacker-turned-entrepreneur, met Kaye at a West London party in 2014 and recalls sensing his frustration and bitterness. Kaye had rare and valuable skills, yet no upstanding company would employ a hacker with his background. Zboralski says he tried to find Kaye legitimate work, without success.

A few months later, Kaye heard from a friend back home about a businessman offering freelance work to people in the Israeli hacking scene. The friend connected them, and the man, whose name was Avi, called to say he was looking for help with cybersecurity. His business was based in Liberia.

In February 2012 a dozen young women in heels tottered up the steps of an office building in Monrovia, wearing fixed smiles and colorful sashes bearing the names of their home counties. They were contestants in the Miss Liberia beauty pageant and had been invited to the headquarters of Cellcom Liberia, the event’s sponsor and the country’s second-largest telecommunications company. Inside, Avishai “Avi” Marziano, Cellcom’s chief executive officer, took the microphone. An Israeli with gelled black hair, Marziano was dynamic and had a gift for flashy promotions. “We are all about Liberia,” he said.

Cellcom was owned by a group of adventurous American and Israeli businessmen led by Yoram Cohen, a Miami-based former attorney with shipping interests in the region, and LR Group, an African investment firm run by former Israeli Air Force pilots. Cellcom had grown rapidly since its 2004 creation, its red-and-white logo plastered across shantytowns and marketplaces around the country. Marziano, a trained engineer, seemed to enjoy the attention. After presenting each Miss Liberia hopeful with a new phone and SIM cards loaded with credit, he grinned for the cameras and signed off with his company’s slogan: “With Cellcom, you are always No. 1.”

In terms of market share, though, Cellcom was stuck firmly in second place behind Lonestar, a former monopoly backed by one of Africa’s largest telecommunications groups. Lonestar’s figurehead, chairman, and part owner was Benoni Urey, who’d faced international sanctions because of his links to jailed warlord Charles Taylor. (The sanctions were lifted in 2014.) Urey’s 40% stake in Lonestar made him Liberia’s wealthiest man, one of the country’s few bona fide millionaires.

Across Africa, mobile phone use was soaring, bringing technology to places where few people had access to a computer. The rivalry between Urey’s Lonestar and Marziano’s Cellcom was “cutthroat” from the start, according to Nagbe, the Liberian information minister. When Cellcom announced it would give defecting Lonestar customers a month of free calls, a decade-long price war followed. Under Marziano, Cellcom gave away 100 motorcycles in 100 days, commissioned a pop song for promotional videos, hired comedians as spokespeople, and mocked Lonestar relentlessly in its ads.

Urey complained to the Liberian Telecommunications Authority, as well as to President Ellen Sirleaf, that Cellcom’s giveaways were unfair, to no avail. Cellcom’s market share grew steadily. At its 10-year anniversary party in December 2014, scaled down somewhat because of a deadly Ebola outbreak, Marziano told guests that the company’s development phase was over. Now it was time to dominate. “We aim to be at the top of the telecommunications market in 2015,” he said.

At least part of Marziano’s plan would rely on a man who’d never set foot in Liberia: Daniel Kaye. The CEO and the hacker met for the first time in London in about 2014. They made an odd pairing. Marziano liked to quote Henry Ford’s management aphorisms and spend hours at the gym, taking steroids to get extra ripped. He also entered bodybuilding contests, where he posed for photos in ▶

◀ barely-there underpants. Kaye smoked weed and played *Skyrim*, a swords-and-sorcery computer game. Even so, they hit it off. Kaye saw in Marziano a more stable future with long-term contracts or perhaps a full-time job. Marziano saw in Kaye someone who could solve problems, no questions asked. You'll deal directly with me, he told Kaye.

One of Kaye's first tasks was to secure the systems of Cellcom's sister company in neighboring Guinea. Kaye came up with a tool that could encrypt Cellcom's data on command in case political instability threatened its operations. For that, Marziano paid $50,000, plus several thousand dollars more for routine security tests. The next bit of business was far less benign. Marziano ordered Kaye to hack into Lonestar's network to look for evidence of bribery or other misconduct. Kaye couldn't find anything incriminating, so he downloaded a Lonestar customer database and sent it to Marziano, who appeared to enjoy the subterfuge. "It's like a drama movie," he told the hacker.

In 2015, Kaye and Marziano discussed using DDoS attacks to slow down Lonestar's internet service and irritate its customers into switching. Kaye started small, using a website called "VDos Stresser" that bombarded other sites with traffic for a fee. Leaked messages from a VDos database show an individual using the name "bestbuy," likely Kaye or an associate, asking about the service on offer. "I need quite a lot more power," bestbuy wrote.

By now, Kaye was earning enough from Cellcom and other gigs to move to Cyprus, where he rented an apartment with a pool and a sea view. If he could do his job from anywhere with an internet connection, why not do it from somewhere sunny? His fiancée joined him.

Marziano's future was also looking bright. In January 2016, Orange SA, the French wireless carrier, announced it was buying Cellcom Liberia. With global sales of about €41 billion ($45.6 billion), Orange is a giant, part-owned by the French government. The terms of the deal and identity of the sellers weren't disclosed, but it would mean a big payday for Cohen and his backers. Orange kept Marziano on as a consultant, but he remained Cellcom's CEO.

The deal, however, didn't cool the hostilities between Cellcom and Lonestar. Weeks later, in a press statement that called out Cohen by name, Lonestar accused Cellcom of illegally texting customers to offer its latest promotion. A Cellcom spokesman responded: "Lonestar is a big crybaby, bent on exploiting the Liberian people."

The strain of malicious software known as Mirai first emerged in 2016. Named, probably, after a Japanese cartoon character, it was created by gamers to wield against other gamers, specifically those playing *Minecraft*.

Mirai sought out webcams, wireless routers, and other cheap, poorly defended devices that could be hijacked for DDoS attacks against other *Minecraft* players. It could also seek out fresh targets semiautonomously, spreading itself without human input. In the summer of 2016, the malware doubled its number of infected machines every 76 minutes to create, within a few days, the largest botnet on record.

Before the American college students who wrote the code were arrested, they shared it on hacking forums, providing the basis for dozens of variants. Kaye, who was looking for a superpowered botnet, thought it might be just what he needed. He tweaked the code to exploit a vulnerability in Chinese-made security cameras, made sure his malware blocked other forms of Mirai so no one could take over his botnet, and then, in September 2016, turned his creation loose.

"If it works I should have access to five million cameras that I can use," Kaye told Marziano using an encrypted messaging service. Marziano agreed to pay him $10,000 a month for the "project." Later that September, he asked Kaye to test the botnet on a competitor's website offering cheap international calls—the site, Marziano said, was "killing my international traffic" at Cellcom.

Even Kaye didn't know exactly how big his botnet had become, so he tested it on a site that measured traffic. Visualized in a graph, its power looked awesome: It could direct about 500 gigabytes' worth of data—roughly equivalent to downloading *Avengers: Endgame* 50 times in ultra-high definition—per second. His target didn't stand a chance. Liberia's internet infrastructure was already fragile, dependent on a single undersea fiber-optic cable to connect to the outside world. Faced with a half-million machines sending data all at once, Lonestar's servers would simply stop functioning. Kaye pulled the trigger again and again, at least 266 times from October 2016 to February 2017. He kept in touch with one of Marziano's analysts to monitor the impact in Liberia, texting regularly to ask how Lonestar's network was performing. "Almost dead," the analyst said one day in November. "Really? Sounds good," Kaye replied.

Marziano's company had for years claimed to be Liberia's fastest network. Now it was undeniable. On Nov. 9 an apparently satisfied Marziano sent a photograph of a newspaper clipping to Kaye. "After crippling cyber attack: Liberia seeks US, UK Aid," the headline read.

Kaye, though, was alarmed. He'd assumed no one would care about a company in Liberia and hadn't made much effort to cover his tracks. Security researchers had also noticed his botnet's unusual power and focus. They christened it Mirai#14. Marcus Hutchins, a British security analyst known as MalwareTech, set up a Twitter account to record the botnet's targets. Soon afterward, one of the Mirai variants turned its power on Hutchins's website, knocking it out. He took the attack as a warning to back off. When Kevin Beaumont, another British researcher, tweeted about the botnet, it started sending threatening messages, like "shadows.kill" and "kevin.lies.in.fear." (Kaye denies targeting Hutchins or Beaumont.) "It got out of control," Kaye wrote to a friend in Israel.

Then the outbreak spread to Germany. Each camera infected by Mirai#14 was continuously reaching out to other devices, trying to get them to download the software.

Instead of joining the botnet, Deutsche Telekom routers simply crashed. It's not clear whether Kaye was deliberately trying to expand his botnet by targeting German devices, but he certainly didn't intend for them to stop working. Unlike Liberia, which lacked even basic computer crime laws, Germany's police force had a formidable technology division. I'm f---ed, Kaye thought. On Nov. 27 his friend in Israel messaged to ask: "What's happening?" Kaye replied: "I have broken the Internet and am dead afraid but otherwise everything's hunky dory."

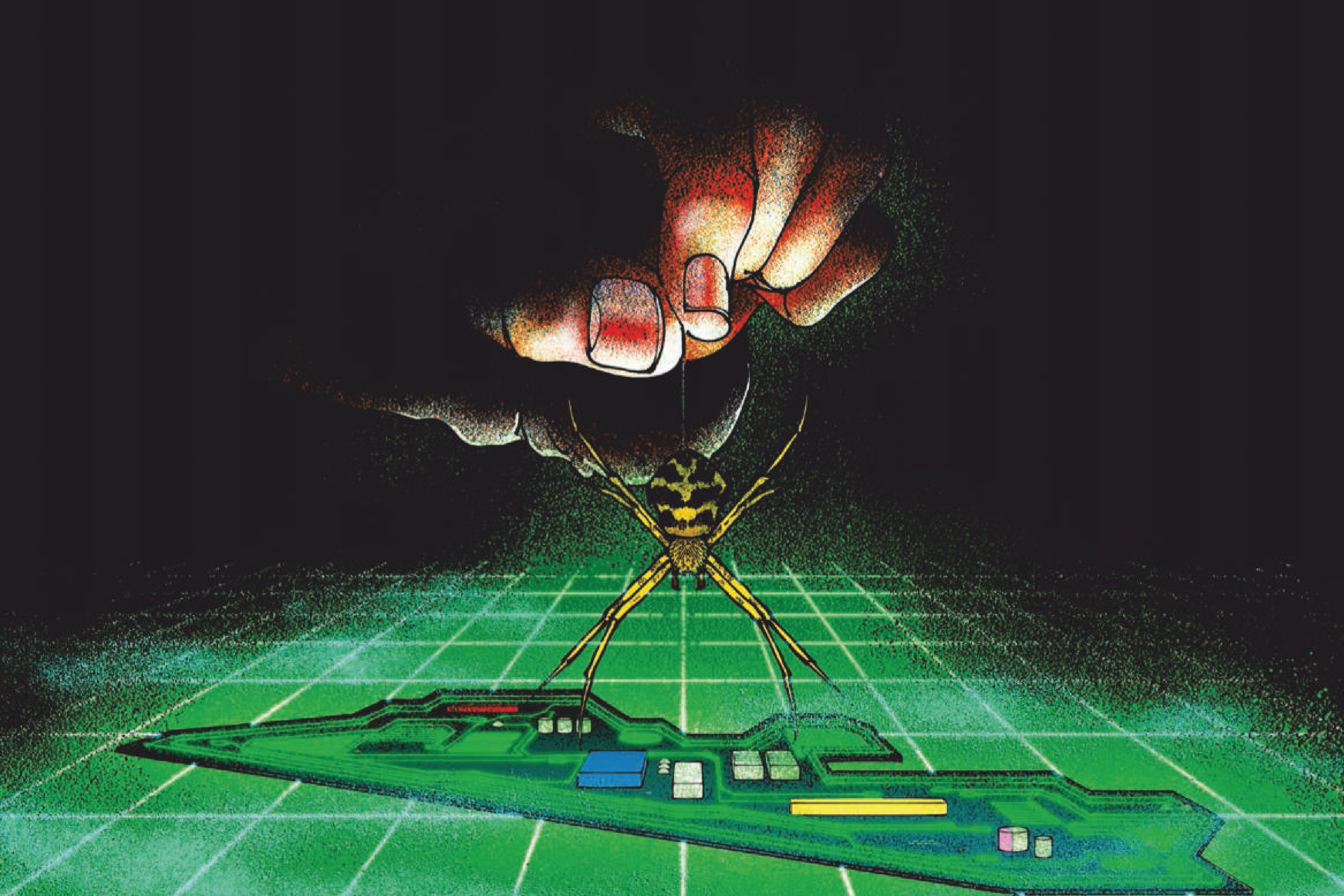
In an effort to distract attention from what he'd done in Liberia, Kaye decided to share his botnet, just as the original creators of Mirai had done. Working with contacts from hacking forums, he sent out spam messages offering access in return for Bitcoin, with prices ranging from $2,000 to $20,000. Some of his first customers were gamers, who used it against rivals. Others had more ambitious targets.

On Jan. 11, 2017, employees at Lloyds Bank Plc, in the U.K., received emails from someone using the alias "Ibrham Sahil." Lloyds's website would be taken offline, the messages said, unless the bank paid a "consultancy fee" in Bitcoin, then worth about £75,000 ($90,000), rising to £150,000 after two days. Lloyds didn't pay. Twenty minutes later, its website was disrupted by the first of 18 DDoS attacks over 19 hours.

Sahil contacted Barclays Bank Plc the same day. What happened to Lloyds was no glitch, Sahil wrote. Barclays would suffer the same fate unless it paid 75 Bitcoin within 18 hours. "Don't make us get our money by using well time PUT options on the Barclays share price," Sahil wrote, threatening to force down the bank's share price unless it complied. It didn't, and Barclays' website was hit a few days later. Both lenders spent about £150,000 each to mitigate the effects of the attacks and keep their sites up and running.

Hutchins, the British researcher monitoring Mirai#14 and other variants, watched the situation unfold. His job, working for a company called Kryptos Logic, was to seek out the internet's most dangerous malware (worms, bugs, and viruses), which he did from Devon in England's rural southwest between trips to the beach to surf. He traced Mirai#14 to a server and found contact details for the operator, who was using the alias "popopret."

There was little Hutchins could do remotely, so he decided to see what would happen if he just asked popopret to stop. He composed a message appealing to the hacker's conscience. As proof of the real-world consequences, he attached Twitter posts from bank customers stuck without access to funds. To his surprise, the hacker responded and seemed receptive. Although Hutchins didn't realize it at the time, he was communicating with Kaye—who retained ▶



"I can't believe I ended up here"

◀ ultimate control of the botnet even as he rented it out—either directly or through one of his associates.

The next day, though, bank websites were still being bombarded. "Wtf?" Hutchins said in a message to popopret, who replied that he was being paid a lot of money by a customer using his botnet. Hutchins tried a different approach. Banks are considered critical infrastructure in the U.K., he said, and protecting them is a matter of national security. Unless you want intelligence agencies coming after you, Hutchins suggested, cut off the customer. It seemed to work. The assault on British lenders stopped. The attacks on Liberia, however, continued.

A few weeks after Hutchins's warning, Kaye flew from Cyprus to London to meet Marziano and collect his latest monthly payment. Marziano brought his wife and young children, and Kaye brought his fiancée for lunch at a tapas restaurant near Piccadilly Circus. (There's no evidence their families knew of any wrongdoing.) Over drinks, Kaye congratulated Marziano on the Orange deal. Marziano handed over $10,000 in cash, which Kaye stuffed into his pocket. The CEO and the hacker parted as friends.

Kaye got to Luton Airport for his flight home to Cyprus, and that's where the police found him.

After Kaye woke up in the hospital, still groggy from the effects of the diabetic coma, the officers took him straight to the interview room at Luton Police Station. It was almost midnight when they began. "I'm sorry if my words are a bit slur-ish and my responses are a bit mixed up," he told his interrogators, according to a transcript of the conversation. "My sugar is very high at this point."

Kaye denied everything. He claimed he wasn't behind the Liberia botnet, hadn't ordered the attacks, and didn't know the names spdrman or popopret. "Maybe I should start with my background?" he said, explaining that he was a security consultant and an "IT solutions designer" who studied malware as a hobby "to stay sharp." He said he might have accessed the servers controlling the Liberia botnet for research but couldn't recall when, how, or what device he'd used. Asked about the encrypted laptop recovered from his luggage, Kaye said he couldn't access it because his password no longer worked.

After about a week in a British jail, Kaye was extradited to Germany to face charges over the disruption to Deutsche Telekom. When he was interviewed at a prosecutor's office, his memory at first was as fuzzy as it had been for the British police. Then the BKA's cryptography department cracked his mobile phone. On it they found WhatsApp messages between Kaye and his hacker friends, discussions on an encrypted chat app with Marziano, a photograph of the type of security camera used in the Liberia botnet, and a video showing someone using the Telnet internet protocol to control a large botnet.

Faced with this damning evidence, Kaye gave a full confession over several days in May. He identified Marziano as the person who ordered him to attack the Lonestar network. "The goal was for the attack to make customers of Lonestar so annoyed about the service they switched to the competitor Cellcom," Kaye told the prosecutor. "There aren't that many options in Liberia." When the prosecutor observed that $10,000 wasn't much of a fee, Kaye said, "I needed the money because I wanted to get married." He added, "I had also had quite a lot to drink at that time. So I took what I could get."

What had happened to Deutsche Telekom was an accident, Kaye said, collateral damage as the botnet tried to spread itself. The prosecutor believed him. Kaye pleaded guilty to computer sabotage and, on July 28, was given a suspended sentence.

In August he was sent back to the U.K., where the National Crime Agency filed charges against him a day later. "He is a sophisticated and computer-literate cybercriminal" motivated by money, prosecutor Russell Tyner said during Kaye's first court appearance. "He offers his services for hire to others." There were 12 counts in all, including blackmail, money laundering, and various computer offenses. Unusually, Kaye was charged with putting lives at risk by misusing a computer, because of the impact of his actions in Liberia. The maximum sentence for that offense was 10 years. The NCA also wanted to pin the Barclays and Lloyds attacks on Kaye.

For the next year, Kaye's legal team negotiated with prosecutors. Eventually, he was released on bail and moved in with his father, unable to leave the country. In December 2018 he agreed to plead guilty to the counts relating to the attack on Liberia. Prosecutors dropped the charges linked to the British banks—Kaye denied he was behind them, and the NCA had no evidence to prove otherwise.

He was sentenced on Jan. 11, 2019, at Blackfriars Crown Court in South London. Kaye, dressed more smartly than usual in a white shirt, looked less defiant than in previous hearings. His mother had flown in from Israel and his fiancée from Cyprus.

"There are no sentencing guidelines for this type of offense," prosecutor Robin Sellers said when the hearing got under way. He cited a victim statement, sent by a Lonestar executive, estimating its losses at tens of millions of dollars.

Kaye's lawyer, Jonathan Green, objected, saying the figures were unrealistic and Liberia's internet coverage was patchy anyway. "Nobody died," he said. "This was commercial skulduggery, not a criminal offense." Kaye is a "highly intelligent young man with a powerful drive to understand how things work," Green told Judge Alexander Milne, adding

that his client had recently received job offers from the security industry. "The world needs Mr. Kaye to be on the side of the angels."

The judge adjourned for half an hour to consider the sentence. Among Kaye's legal team, the mood was upbeat. One of his attorneys, asked if he might escape jail, replied: "Anything is possible." Even Kaye's mother was smiling.

At 4 p.m., the judge came back into court to inform Kaye of his fate. The attack on Liberia was a "cynical and financially driven attack upon a legitimate business enterprise," the judge said, reading from the screen of his laptop. "I sentence you to 32 months in prison. I'm afraid I will not, in the circumstances, be able to suspend the sentence." Kaye, seated in the dock, wiped away tears with his sleeve.

One of the enduring mysteries of the Liberia hack is its timing. When Kaye, on Marziano's instructions, set his botnet on Lonestar, Cellcom had already been sold to Orange, netting a $132 million windfall for its owners. Marziano was just a consultant for the combined company at that point, so why take such a big risk?

Marziano hasn't said anything publicly since leaving Orange Cellcom in 2017. He was arrested by British police that August, just as Kaye made his first appearance in a London courtroom, and released without being charged. The NCA's investigation is, technically, ongoing. Marziano didn't respond to repeated attempts to contact him via mail, email, LinkedIn, or the Ethiopian Maritime Training Institute, where he was listed as a manager in 2017. At his former address in Israel, his now ex-wife says she has no idea where he is.

In 2018, Lonestar Cell MTN filed a lawsuit against Orange and Cellcom in London. Kaye and Marziano are also named as defendants in the suit, which hasn't yet reached court. "As the intended consequence of the DDoS attacks, Lonestar has suffered and continues to suffer a substantial loss," the claim documents allege. Orange has "vicarious liability," even if it didn't know what the conspirators were up to, because of laws making companies responsible for the conduct of employees. Orange said in a statement that it knew nothing about Kaye's activities until it received the legal complaint from Lonestar in 2018. "Orange strongly condemns these actions and has taken all the necessary steps to ensure the full compliance of all its operations with the group's stringent ethical guidelines," the company said.

In Liberia, many people believe the Lonestar attacks were motivated by politics, not profit. Urey, who's no longer Lonestar's chairman but is still a major shareholder, keeps a bottle of Johnnie Walker Blue Label whisky on his desk. "I'm saving it for the day I become president," he says in his office in Monrovia. (He ran unsuccessfully in 2017.)

For years, Cellcom publicly supported the party of one of Urey's opponents, former President Sirleaf, whose government was in power from 2006 until 2018. An attack on Urey's company, the theory goes, might have been intended to weaken him and his All Liberian Party. Urey himself blames the American-Israeli management team that used to own Cellcom. "An American citizen launched an attack on this country, and nothing was done about it," he says. Representatives of Cohen, his companies, and LR Group didn't respond to requests for comment. In defense papers from the Lonestar suit, Cellcom said it had no knowledge or oversight of Marziano's activities after the sale to Orange and didn't benefit from them.

There's really nothing stopping other hackers-for-hire from using DDoS for corporate espionage or chaos. It's proved to be a cheap and effective way to hobble a rival. Since the Liberia attack, the ranks of internet-connected devices have continued to grow rapidly, including cars, medical implants, even beehives. While the technology to defend against botnets has advanced, too, it's yet to be tested by a next-generation Mirai-type incident, according to Payton, the former White House online security official. If that happens, it's unclear how or whether those defenses will hold up, she says. "We won't know until we are there."

Kaye served the first part of his sentence in several prisons around London before moving to Belmarsh, a maximum-security facility that houses rapists, murderers, and terrorists. Its nickname, Hellmarsh, is scrawled on the walls inside.

In a series of interviews at the Belmarsh visiting room, Kaye, now 31, has little to say about his life or work and denies being behind most of the online identities that have been linked to him. He can't even explain his use of Spider-Man references. It was random, he says.

There may be good reasons for Kaye to keep quiet. Some of his alleged aliases have been linked to other offenses. Journalist Brian Krebs, who runs the news website *KrebsOnSecurity*, has reported that bestbuy and popopret were observed on black-market hacking forums selling GovRAT, a virus used to target U.S. government institutions. Bestbuy and popopret were also users of Hell, an infamous darkweb forum popular with black-hat hackers (its slogan: "F--- heaven, hell is hot"). Kaye might be both bestbuy and popopret, as some police officials believe, or neither of them. They might be different people, part of his circle of criminal hackers. Kaye denies being behind either alias, although he admits to using bestbuy's name to cover his tracks.

Kaye says he hasn't spoken to Marziano since their lunch in London just before his arrest. When Kaye is released in early 2020, he'll face court-mandated restrictions limiting his access to phones, computers, and encryption software, though he hopes to continue his career in online security. Until then, he spends all day in the prison kitchen, chopping vegetables. The more controlled environment allows him to avoid contact with Belmarsh's more frightening residents. Does he have any regrets? Of course, he says, looking around at the tattooed inmates in the visiting room. "I can't believe I ended up here." Ⓑ —*With Leanne de Bassompierre, Jonathan Levin, Yaacov Benmeleh, and Jordan Robertson*

The Wild Economics

Watching global market forces at work in the far reaches of Madagascar

# of Plain Vanilla

Vanilla is cured at a warehouse in Sambava

By Monte Reel

Photographs by Elisabeth Real

First, we needed a 4x4 of some sort, along with a driver willing to chance roads that are sometimes passable, sometimes not. The man we found struck us as the quietly skeptical sort, but after a few hundred rutted kilometers, any hesitations he'd been suppressing hardened into emphatic certainties. "The only people who drive on this road," he told our photographer and me, via our translator, "are people who want to kill their cars." Yet he gamely pushed ever deeper into Madagascar's tropical north, until our mud road descended a hill and was swallowed by a wide river. It was the end of the line for the driver. He seemed relieved.

Somewhere on the other side of that water, dozens of farmers would soon converge upon a regional vanilla market in the village of Tanambao Betsivakiny. Growers would negotiate with buyers working on behalf of exporters and international flavoring companies, and together everyone would hash out a collective, per-kilogram price for the crop. Most buyers would pay cash on the spot, and the farmers would hand over several tons of green, freshly harvested vanilla beans.

Those humble beans, whose essence is associated with all that's bland and unexciting, have somehow metamorphosed, butterfly-style, into the most flamboyantly mercurial commodity on the planet. In the past two decades, cured vanilla beans have been known to fetch almost $600 per kilogram one week, then $20 or so the next. Northeastern Madagascar is the world's largest producer of natural vanilla, so every boom and every bust slams this region like a tropical storm. When prices peak, cash floods the villages. When prices fall, it drains away.

Madagascar was largely integrated into global trade centuries ago. The island is bigger than France, with cultural traditions that vary by region, unique biological treasures, and a developing tourism economy. The capital, Antananarivo, is full of laborers, lawyers, bureaucrats, bankers, artists, entrepreneurs, intellectuals—everything a 21st century city of 1.5 million needs. Yet Madagascar is also one of the poorest countries on the planet. You see and feel its disparities most sharply in its more remote pockets, including in the vanilla-growing region of the northeast. The extreme isolation of those communities, their dominance over the international supply, the dramatic changes they undergo during price swings—all of it has turned this part of the country into a semicontained observation lab that exposes both the genius and the insanity of globalized commerce. Visiting one of the seasonal auctions where vanilla enters the global marketplace seems a logical first step to try to understand it all.

So we really needed to cross that river.

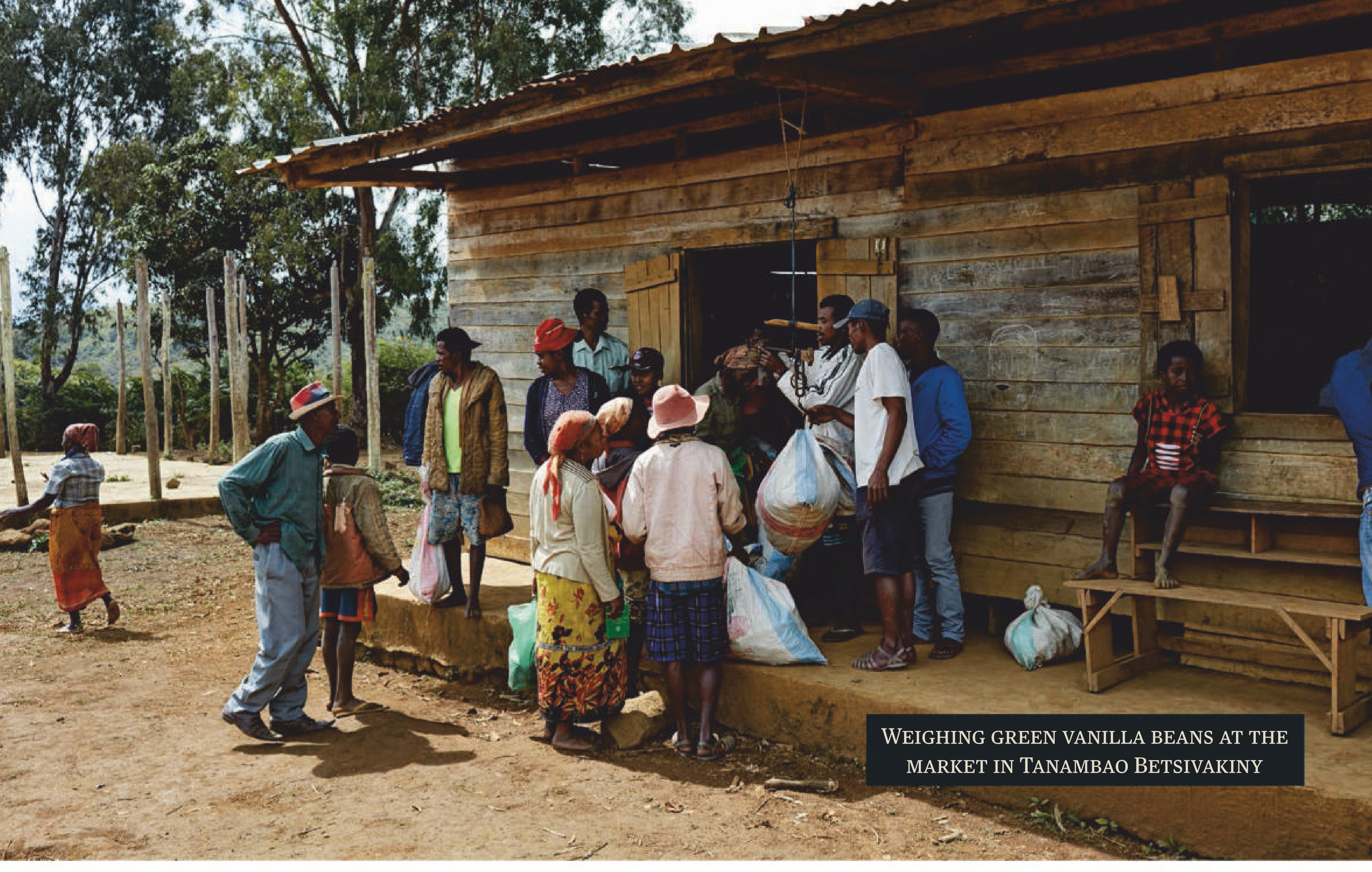
The water didn't look too deep; we spotted people wading out toward the other side, carrying baskets on their heads. We took off our shoes, rolled up our pants, and stepped in. The riverbed was lined with fiendishly slippery, cannonball-size boulders. We plotted a slow, wobbly course to the other side. On the far bank, someone told us the market was still a two-hour trek away.

It was mostly uphill, naturally. When the spiraling dirt road plateaued, we found ourselves on the weedy edge of a village. A couple of young men with motorbikes accepted the equivalent of a couple of dollars for rides to shave a good half-hour off the trek.

If our arrival was accompanied by a whiff of self-congratulation, it dissipated as soon as we saw the farmers. Most had been walking far longer than we had, in flip-flops, with huge sacks of beans hanging from sticks balanced across their shoulders. Some of the bags weighed more than 40 kilograms. And for the farmers, this was the easy part. They'd spent months in the fields, closely monitoring their vines for any sign of a bloom. When they found a vanilla orchid in flower, they rushed to hand-pollinate it. Each flower's fertilization period lasts only a few hours each season; if they missed that window, the plant wouldn't produce beans. Then, as the beans matured on the vine, the farmers hand-stamped the pods with a personalized, Braille-like marking (the horticultural equivalent of a cattle brand), so thieves would have difficulty passing them off as their own if they tried to sell them. The farmers slept in the fields at night, machetes by their sides, guarding their plants through rain, heat, and the buzz of malarial mosquitoes. For many of them, an entire year's income depended on this auction.

It would take place in a simple wood-slat structure about three times longer than the village's typical single-family residence. For most of the year the building was the local schoolhouse. The furnishings consisted of a table, scattered chairs, and a rectangular chalkboard. Outside, hanging under the eaves, was a portable hook scale.

One at a time, the farmers entered the hut and emptied their bags of beans onto the floor. Government-authorized inspectors sifted through the beans, making sure they were all suitably large and ripe. They rebagged the beans and


Weighing green vanilla beans at the market in Tanambao Betsivakiny

clipped the sacks to the scale outside, then logged the weight of each farmer's harvest in a ledger.

In the dirt yard outside the hut, several dozen men stood in tight circles, watching the weigh-in. They were the buyers, or collectors, as they're called here. Most had arrived that morning, using rafts to get their motorcycles across the river we'd forded.

The regional markets follow an established protocol, the men explained. After the weigh-ins, the farmers gather together and come up with a per-kilo asking price, then write that figure on the chalkboard. The collectors stare at the number for a while, then huddle up. They rub out the farmers' price and scribble a counteroffer. This back-and-forth is repeated until the figures match. When that happens, the buyers divvy up the beans, collecting however many tons each has agreed to buy. The process can take a day or a week. If this one stretched into tomorrow, most of the farmers and collectors planned to search for a friendly villager with a little extra floor space where they might curl up and sleep.

The year before, at a market much like this, one collector had gone rogue, forgoing the chalkboard system and negotiating directly with a village chief behind closed doors. When news of the man's attempt to sidestep the protocol spread to the other collectors, he was chased through the village, apprehended, and jailed.

This particular sale featured no spectacular foot chases or citizen's arrests. But it had plenty of unexpected intrigue and deception. The business is cruel, humane, comic, tragic, ingenious, and flat-out insane, often at the same time. As we struggled to untangle the drama playing out, we began to suspect that our original goal—to try to understand the vanilla trade—should be secondary. It seemed more important to simply observe this whole business in a particular way: with a sustained appreciation for how incredibly wild global trade, at its most elemental level, actually is.

Vanilla, in its essence, is an adventure story.

Vanilla orchids are native to Mexico, and for a few hundred years after the Spaniards first brought the flowers back to Europe, no one could get the beans to grow anywhere else. In 1836 a Belgian horticulturalist figured out why: They emerge from the flower only after it's pollinated by one of two rare species of bees native to Mesoamerica. Five years after that discovery, a young slave named Edmond Albius from the Indian Ocean island of Réunion (then called Bourbon) realized he could hand-pollinate the orchids by carefully manipulating the male and female parts of the plant. His ingenuity transformed vanilla into a cultivatable crop, and small plantations began popping up all over the world. The orchids seemed to grow especially well in Madagascar, 500 miles due west of Réunion.

For the next 150 years, vanilla played it straight, drawing little attention to itself. By the 1980s, Madagascar was producing about 30% of the world's supply. Government controls kept prices tethered pretty tightly, to around $50 or $60 per kilo for cured beans. "You had some fluctuations, maybe $10 up or down, but it was pretty stable," says Craig Nielsen, co-owner of Nielsen-Massey Vanillas Inc., a flavor company based in Illinois and the Netherlands that's dealt in the ▶

◀ beans since 1907. “Then, under pressure from the World Bank, which they owed a lot of money to, Madagascar was forced to abandon those price controls in the mid-1990s.”

That’s when vanilla started to shed its inhibitions. Prices dipped for a year or two. Then, in 2000, a powerful cyclone flattened the northeastern part of the country. It takes three years for a newly planted orchid to produce beans, so harvests waned for the next few years, causing prices to spike, then collapse. International buyers reported that local exporters were asking about $600 a kilo for cured vanilla on a Monday and roughly $20 by that Friday. Warehouses were stuck with beans they couldn’t sell for anything close to what they’d paid for them, and a couple of the biggest, most well-established vanilla dealers in the country went out of business.

For the past four years, prices have been riding high again, flirting with the $600 mark in 2018 and rarely falling below $400 since. (The going rate this fall was about $420 per kilo.) The spike is sometimes attributed to a 2015 announcement by Nestlé SA that the company would use only all-natural vanilla in its products instead of imitation flavoring. Other companies followed suit. The true impact of the decision is a matter of debate. In the past year, consumers have sued numerous food and beverage companies, Nestlé among them, claiming that some if not most of their vanilla flavoring still comes from sources other than beans. Spencer Sheehan, a New York attorney who’s filed suits against more than 25 companies, contends that the flavor is often derived from the “other natural flavors” generically cited in the ingredients lists of various products. The plaintiffs are seeking monetary damages, but none of the suits has yet received class-action status from a judge. Regardless of the validity of those suits, few in the industry say demand for natural vanilla has changed enough to protect prices from another dip. Almost everyone thinks a significant price plunge is a matter of when, not if.

Inspectors examine and log the farmers’ beans

Because northeastern Madagascar is so impoverished when vanilla prices aren’t high, banks and other financial institutions don’t open a branch near many villages. Farmers are more likely to bury cash under their houses than to put it into an account. The market demands that drive the exaggerated price swings are wholly separate from their lives; almost no one here actually uses vanilla, which is viewed as a product only foreigners consume. The impermanence of cash flow, along with the near-complete disconnect from forces moving the market, means the farmers view international commerce from a much different angle than outsiders might. “Consequently, money in northeastern Madagascar is not perceived as a straightforward, interest-based sum accumulating over time in an orderly fashion,” according to a study published last year in *American Ethnologist*, the journal of the American Ethnological Society. Annah Zhu, the author of the report, wrote that money in the vanilla-growing region is instead treated as a “volatile material that comes and goes, imbuing the region with fantastical undertones of alternating abundance and dearth.”

That sporadic abundance has generated a new genre of local storytelling, almost folkloric in nature, that catalogs local examples of financial decadence. It’s called *vola mofana*—roughly translated as “hot money” spending—and the tales that illustrate the concept are difficult to verify but easy to repeat.

It’s said that one vanilla farmer was observed buying the entire supply of mangoes from a roadside stand; he paid the vendor 10 times the asking price, then joyfully smashed every piece of fruit on the road. People say chameleons have been spotted skittering wild through villages with money glued to their backs. One vanilla farmer reputedly boiled all his money in a pot and ate the soggy, globular mass. We heard about farmers who had smoked cash, rolling tobacco in it as if the bills were cigarette papers. Zhu, in her journal article, reported that at a festival, a man stepped up to a carnival booth, bought a handful of rings to toss at a cluster of bottles, turned around, and threw every ring in the opposite direction. “This is how you play with money!” he yelled.

I wasn’t sure whether to believe these stories or not. Most were said to have happened several years ago to people who’ve since faded into anonymity. And most of the farmers we met seemed frugal, intent on building wealth rather than squandering it. Yet almost everyone has a story like this to

tell. Zhu acknowledges some might be more legend than fact, but their pervasiveness makes them meaningful. Her point in gathering and repeating the tales wasn't to dismiss the vanilla farmers and collectors as simpletons dazed by the sudden collision of the modern and the traditional. Vola mofana stories, she says, don't describe an awkward phase of Madagascar's economic development; rather, the profligacy they recount can be considered a "tactical weapon" deployed by residents against the "erratic, nonlinear development that characterizes globalization today." By treating money so cavalierly—either literally or figuratively—the vanilla farmers diminish the power the modern economic order can exert upon them. Actions that seem to defy logic actually "reflect and often resist the magicalities inherent in modern forms."

A translation: Maybe it's not the farmers and collectors who've gone off the rails when confronting the modern economic system; maybe what's crazy is the modern system.

Farmers are sometimes told that if they produce better beans, the market will reward them with higher prices. But that's not how it works.

"The worst vanilla, by far, that I've ever seen in my life was the stuff that sold for $650 a kilo," says Josephine Lochhead, president of Cook Flavoring Co., a family business in California that's been dealing in vanilla for more than a century. "And the farmers think, Gee, I've worked on these beans for six months, sleeping in the fields through rain, babying them, and this year's beans are much better than last year's beans—so shouldn't I get more money for them than for the terrible beans I grew last year?"

If a crop is projected to be weak and scraggly, buyers get antsy, eager to secure whatever they can get, as soon as they can. The farmers try to satisfy the demand, picking beans earlier than they otherwise might, and the auction dates tend to slide forward. Sometimes an early black market emerges, with beans trading hands under the table before the official markets commence. Prices drive upward, and the beans—picked too soon, with less flavor than mature ones—often turn out to be even worse than predicted. When the crop is expected to be healthy, all of that is turned upside down. The farmers feel less pressure to pick their beans early; they allow the vanilla to mature on the flower and develop a richer flavor, and prices generally tend to stay lower. It's what market economists call a "perverse incentive."

The way money moves, traveling from the accounts of billion-dollar corporations and into the hands of the farmers, also follows a logic of its own. Madagascar's largest currency denomination is the 20,000-ariary note, worth a little more than $5. It went into circulation in 2017, a year after vanilla ▶

A vanilla collector checks fields in Tsarahitra

Lochhead and Randriamihaja inspect a farmer's beans

◀ prices shot toward the lofty heights where they yet remain. The previous year, when the 10,000-ariary bill was the biggest to be had, international buyers scrambled at harvest time to get their hands on all they could find. They rushed to the big banks in Antananarivo and bounced around the branches of the northeast, only to be turned away.

Lochhead was one of those buyers. She couldn't figure out what was going on until she saw local reps from McCormick & Co. arrive. The American spice giant had anticipated a price spike and acted faster than anyone else, she recalls, withdrawing ariary by the crateful from banks in the capital, then reinforcing its stash at smaller branches. "No one else could get any," Lochhead recalls. "We couldn't buy vanilla for three days, until the government printed more money and sent it up here. It was crazy."

Whenever the price of vanilla spikes and international executives are confronted by Madagascar's infrastructural precariousness, they ask themselves, Why are we subjecting ourselves to this? Wouldn't it be easier to get our vanilla from someplace else?

New vanilla cultivation projects have been introduced nearly everywhere orchids naturally thrive. But vanilla is stubborn. It likes to grow among other plants, and if you try to create a huge, easily managed, monocultural plantation, certain fungal diseases tend to spread quickly. "We've started farms in Fiji, in Indonesia, and we have one in Papua New Guinea," Lochhead says. Those farms have worked, to a certain extent. "They just don't work as well." In the Netherlands, teams of horticulturalists embarked in 2012 on a pilot project to cultivate vanilla in greenhouses. Earlier this year they ran out of funding and concluded their crop wasn't financially sustainable.

Connoisseurs describe vanilla from Indonesia as earthy and smoky; from Uganda as chocolaty; from Tahiti as fruity and flowery; from Mexico as hinting of clover and nutmeg. But the Malagasy stuff tastes like what people expect from really good vanilla: rich, sweet, creamy. Those subtleties might help explain, to a fractional extent, why Madagascar dominates the trade.

A much bigger reason is cheap labor. Since Madagascar let the free market take over, the country's share of world vanilla production has risen to 80% or more, according to industry experts. The broader price swings are partly responsible for that growth. Vanilla beans are delicate and incredibly labor-intensive, and no part of the planting, pollinating, cultivating, and curing process has been mechanized. Each vanilla bean will be touched by human hands hundreds of times—perhaps thousands—before it's exported.

When the beans are bringing in hundreds of dollars per kilo, many countries in desirable latitudes can afford to deploy that much labor. But what about when prices tank? Wages in the other vanilla-producing countries are 10 to 15 times higher than in Madagascar, where the legal minimum wage for agricultural workers is 18¢ an hour. In those other places, vanilla plantations would hemorrhage money during downturns. "No one will invest in that," Lochhead says. "How can you compete with Madagascar, where people work for $1 a day?"

It's a perfect illustration of the globalized economy's

heat-seeking, laser-guided ability to stretch a resource to the limit. For those arguing that globalization is unreasonable and exploitative, the vanilla farmers of Madagascar have become a problem to solve. Various nongovernmental organizations have introduced campaigns to raise wages, stamp out child labor, and direct more profits to the farmers and villages carrying the industry on their back. Many flavor companies have gotten on board, too, creating the Sustainable Vanilla Initiative.

In northeastern Madagascar there's widespread suspicion that middlemen—the collectors and local exporters—are sponging up more than their fair share of the cash flowing into the region. This year, Lochhead devised a plan to try to work around them. She and a former vanilla farmer named Dylan Randriamihaja formed a cooperative consisting of 63 farmers from four villages. Throughout the growing season, Randriamihaja visited the farmers, monitoring their techniques, making sure they complied with organic standards, and checking the quality of the beans.

The plan was that after harvest, the co-op members would take their beans to one of the little regional markets. The collective, negotiated price would still apply to their crop, but Lochhead would pay a premium of about 2% above the going rate, and they'd direct all of their beans to her. Lochhead would get as many as 15 tons of beans she could trust were organic and of high quality; the farmers in turn would pocket more money from her than they'd get from a collector. What's more, Lochhead wouldn't have to pay any collectors a commission for negotiating the sale, and—because Randriamihaja had an exporting license—the two of them could ship the beans overseas themselves.

Average Price of Vanilla per Kilogram

$600
400
200
0
2013 2014 2015 2016 2017 2018

Lochhead and Randriamihaja sent an assistant to the market where the co-op farmers gathered—the same one, across the river and up in the hills, that we visited. He'd oversee the sale and haul the beans back to Sambava, the city closest to the remote vanilla markets and the capital of the international trade.

That was the plan, anyway. But the vanilla trade did what it often does to a well-thought-out plan: It wrecked it. Or, rather, a mysterious man in a red hat wrecked it.

While the collectors milled around the market, Marcel Sama walked among them, sweating under a fierce sun. He was the emissary sent to the market by Lochhead and Randriamihaja, and he called the members of their co-op together for a meeting behind the auction building, away from the others.

He explained to them that he expected the collective sale price at this market to be close to $55 per kilo for the raw, uncured beans. (Raw vanilla beans generally sell for about one-seventh or one-eighth of what cured ones do, partly because beans shrink during the curing process.) Some of the farmers grumbled; they'd been hoping for a little more. Sama let them talk out their frustrations until the meeting ended in smiles and backslaps.

The weigh-in was finishing up, and negotiations were about to commence. Two young men grabbed two packed rice sacks from the cargo racks of their motorbikes and hoisted the parcels onto a pile of bagged beans. They gently draped two jackets over the bags, as if to hide them, but everyone knew they were full of cash. The men told us they'd hauled the money to the market on behalf of Symrise AG, a multibillion-dollar German flavor and fragrance company, which buys more Madagascar vanilla than anyone else.

Another collector, a man in a red baseball cap and an olive green jacket, lingered at the perimeters of the market, keeping a lower profile as the other buyers began to discuss their collective bid. Most of them agreed that a bid of about $55 per kilo was fair. Sama was happy to hear it. But then the man in the red hat piped up, saying he'd be willing to pay $62 per kilo.

Sama couldn't believe it. It was too much. If the bid held, the co-op would have to pay its farmers about $65 per kilo—20% more than Lochhead had paid for several tons of beans a few days earlier at another market. Some of the other collectors indicated they might be willing to go higher than $55, but this bid seemed excessive. And the unbendable custom of the market is that all beans must sell at the same price. The man in the red hat indicated that this wouldn't be a problem: He would buy the entire inventory at $62 per kilo, if the farmers agreed. Even the members of the co-op couldn't resist such an offer.

There was just one thing. The money, the man explained, was still in offices on the other side of the river. It would take him several hours to get all of it hauled out to the market hut. As it was already afternoon, he asked them to give him until the next morning, when he'd return with the cash, first thing. It was a deal. Some of the farmers spent that night sleeping next to their beans, to make sure nothing was stolen.

The next morning, all of the farmers reconvened. But the man in the red hat was nowhere to be found. Hours ticked by. He didn't return. ▶

DATA: NIELSEN-MASSEY

By the next day we had rejoined Lochhead and Randriamihaja in Sambava. Sama called them to say the false bid had thrown everything off. Negotiations had started anew. The farmers were now angry—and empowered. They'd observed some collectors seriously considering matching the bogus bid the day before, and their baseline asking price was no longer $55 per kilo. When a few collectors agreed to the $62, Lochhead and Randriamihaja bowed out. The cooperative farmers sold their beans to others.

"It's frustrating, because the farmers can say our co-op didn't offer them a good price," Randriamihaja said. "But I think they will come back to us. We will try again."

The man in the red hat had been a saboteur, he guessed. But who sent him? Rumors floated around the market that the man worked for an exporter that didn't want cooperatives limiting its access to beans. "I think he probably was sent by a big company, just to upset the market," Randriamihaja speculated. "It has happened before, several times. They want to ruin our reputations."

Olivier, with his family, shows off some of his partially cured beans, known as vrac

In 2019 about 400 companies were licensed to export vanilla from Madagascar, and many are small and relatively new. Randriamihaja, who got his license three years ago, is one of those up-and-comers. Some people, particularly the established exporting companies, argue that some of these inexperienced dealers are diluting Madagascar's market with low-quality, poorly cured beans. They support ongoing government initiatives to cut the number to as few as 40 licensees.

"They say it's for quality reasons, but that doesn't make sense to me," Randriamihaja said. "Those big companies are handling 600 tons a year, so how can they control the quality of that? We do something like 15 tons a year. We can provide a good, quality bean, because we're controlling them every day, through every step of the process."

Lochhead nodded in agreement. To her, the license reduction scheme felt like a power play. "It's a racket," she said. "A big boys' club."

She and Randriamihaja now needed another way to get vanilla beans. They spent the next two days going to villages in search of *vrac*, the term for beans that have been partially cured. Vrac can be stored for longer periods than raw beans, and some farmers like to deal in it because it can provide income in the months after the harvest. Inside a one-room hut of split bamboo, Lochhead and Randriamihaja found an 80-year-old man named Farlahy Gilbert. He looked as thin and wizened as the beans he spread out for them to inspect. Lochhead cast a critical eye on his supply. She lifted a couple of the oily beans to her nose. "Ooh," she said, wincing. "There's mold. That's bad. Smell it."

Gilbert fetched another batch and poured it out for them. "It looks pretty wet," Lochhead said. She guessed it was about 40% moisture. Gourmet vanilla vrac should be 32% to 35%. "Tell him to get this out in the sun," she told Randriamihaja.

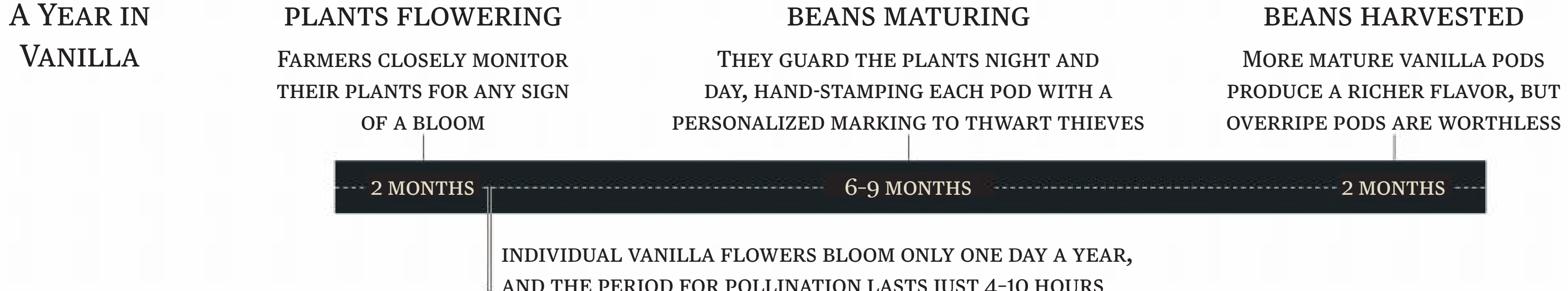
Their next stop was a hut right across the road, where a 34-year-old farmer named Be Olivier lived. "Now this is workable," Lochhead said, kneeling down in front of the vrac the farmer had spread out on a coffee table for inspection. Her flowing white dress pooled around her legs, and she closed her eyes as she inhaled the sweet, heavy scent. To her, this was the best part of her business: the direct, sensory pleasure when things went right. "This," she said, pulling a moist brown pod from the pile, "is the perfect vanilla bean." She admired it, smiling, for an extended moment. "How much does he have?" she asked.

Olivier told them he had plenty to sell, but he wouldn't say exactly how much. "They will never tell you that," Randriamihaja said. They feared theft.

By any international standard, Olivier was living in poverty, without running water or reliable electricity. But high vanilla prices had allowed him to accumulate some enviable assets in recent years. He'd grown up in a hut made of palm thatch and moved to one of split bamboo; now his walls were made of solid wood planks. And unlike most of the village's huts, his had two rooms. Where once his floors were bare earth covered by rugs, now he walked on smooth, red-painted boards. The chairs in the living room had cushions on them. And he had a television, powered by a single solar panel balanced on the peak of his corrugated roof and connected to the village's only satellite dish.

When we asked Olivier to verify the spelling of his name, he motioned to his 7-year-old daughter, who'd been watching from a bed in the adjoining room. He'd recently enrolled her in school, and when she spelled out his name for us, he smiled with undisguised pride. She was mastering things he'd never thought possible for himself.

Randriamihaja could relate. He grew up in a crowded hut with six sisters and three brothers, the children of vanilla growers. Tiny fingers were valuable when handling delicate flowers, and he worked the fields for years. His parents rarely collected cash for their beans; more often, they'd trade them to visiting Chinese and Indian merchants for items such as blankets and sugar. As the vanilla market



opened up in the mid-1990s, Randriamihaja encountered more international buyers.

A combination of curiosity and ambition drew him toward them. Slowly, to complement the Malagasy and French he spoke, he taught himself to read, write, and speak English. He'd practice with the few tourists he met at the Orchidea Hotel in Sambava. A natural conversationalist unafraid of throwing himself into new experiences, he decided his future might lie in the tourism industry. He traveled to Antananarivo, completed courses there, and returned to start a business as a guide.

The work was inconsistent, mostly because only the most intrepid tourists made it to his corner of the country, and after a few years he decided to return to the business he'd grown up in. He started farming and curing his own vanilla beans, selling them to local exporters. Five years in, he got a call from the proprietor of the Orchidea Hotel. An American was in town, he was told. She was interested in vanilla, and she needed help.

It was 2015, and Lochhead was midway through her first visit to Madagascar. For years she'd been buying its vanilla from afar, but she wanted to immerse herself in a trade she'd also been born into, to experience it directly and connect herself to its source. Things weren't going well: She was battling stomach bugs, and the niece who'd accompanied her was holed up in the hotel, shivering through a bout of malaria. Lochhead had hoped to explore the possibility of dealing more directly with locals in purchasing her beans, but she was in no condition to explore anything. "I was kind of overwhelmed," she remembered.

Randriamihaja met her at the hotel, and they jelled. He became more than just a guide to the local industry, getting his exporting license later that same year and turning into something more like a partner. He listened to her frustrations and searched for solutions. When she said she needed a more reliable source of certified organic vanilla, he organized the cooperative and trained its members to make sure they followed the certification standards. Although the cooperative ended up selling its beans to other buyers this year, both he and Lochhead viewed that disappointment as a learning experience.

Not too long ago, he took the leaders of the cooperative to a regional bank branch to show them how the banking system works. He opened an account for the group and, over the course of multiple visits, showed them how money could be electronically transferred from one account to another.

"They didn't trust it at first," Randriamihaja said. "It was very hard to convince them. But after the leaders saw that the money really was in there, that it wasn't a trick, and that they could get the money anytime, they were OK with it. So this is how we will pay them from now on."

Recently, Randriamihaja boarded a plane and flew beyond the shores of his island for the first time. He traveled all the way to the U.S. to visit Lochhead's vanilla production facility in Paso Robles, Calif.—his turn to plunge into an entirely foreign landscape. From Los Angeles, he made his way north. He came to the banks of the Santa Clara River, crossed it, and ventured back toward the coast. Everything was exotic: the five-lane freeways, the baseball stadiums, the wineries, the arrow-straight rows of asparagus and cabbage stretching to the horizon. It was the adventure of his life, and it changed him.

Now, back in Madagascar, he was overseeing a team that was curing several tons of beans Lochhead had recently bought. The workers spread the beans on drying racks in his yard. At the front of his house, outside a guard station, an American flag now flew beside the one from Madagascar. In his office a stereo played country and western music. Randriamihaja wore a T-shirt that, against an outline of a map of America, said, "This Is Chevy Country."

It would be difficult to come up with a more on-the-nose illustration of how globalization colors all it touches. But in Randriamihaja's office, the colors blur and bleed into one another. Is the image of him—in that T-shirt, listening to that music, under that flag—an example of how local cultures get subsumed by more dominant ones? Or is it a reflection of how one man celebrates the connections that have permanently broadened his perspectives?

It's both things at once, sort of like the poster Randriamihaja displays on the wall behind his desk. It advertises a campaign by the International Labour Organization to stamp out child labor in the vanilla fields. He backs that program and the intentions behind it. But he admitted his perspective is blurred by mixed feelings.

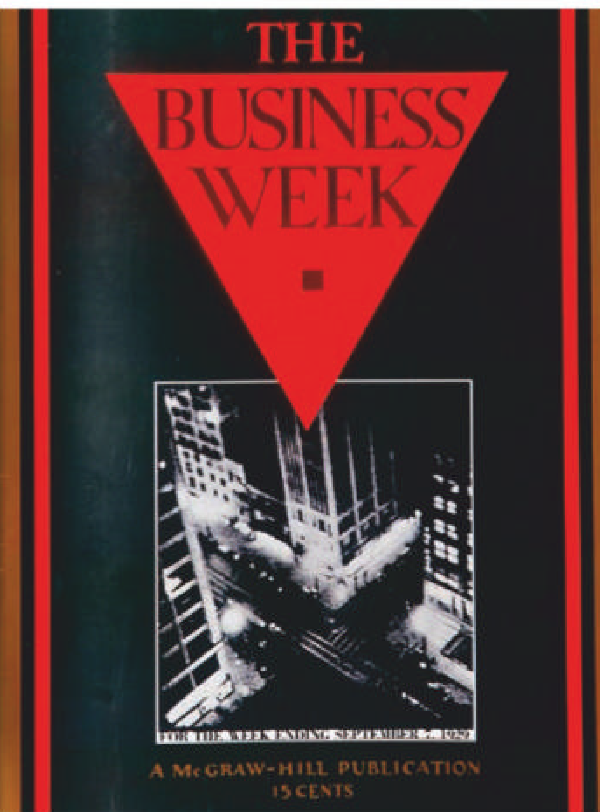
"I guess they could say I was a victim of child labor," he said. Was it exploitation or opportunity? You could make a strong argument either way, he said. "To me, I was just helping my parents."

Above us, the clank of hammers threatened to drown out the country music coming from the stereo speakers. On the roof, workers were busy adding another story onto Randriamihaja's house. Ⓑ

90 Years of Businessweek

▼ 1920s

By Peter Coy, James E. Ellis, Paula Dwyer, and Joel Weber



● 1929
The first issue of *The Business Week* appears. It's a weekly remake of the *Magazine of Business*, which was acquired a year before through the purchase of A.W. Shaw Co. of Chicago.

● 1929
A month and a half later, on Oct. 28, the Dow Jones Industrial Average falls 13% and an additional 12% the next day, helping set the Great Depression in motion.

WALL STREET: AP PHOTO. MCGRAW-HILL BUILDING: SAMUEL H. GOTTSCHO/MUSEUM OF THE CITY OF NEW YORK COLLECTION

▼ 1930s

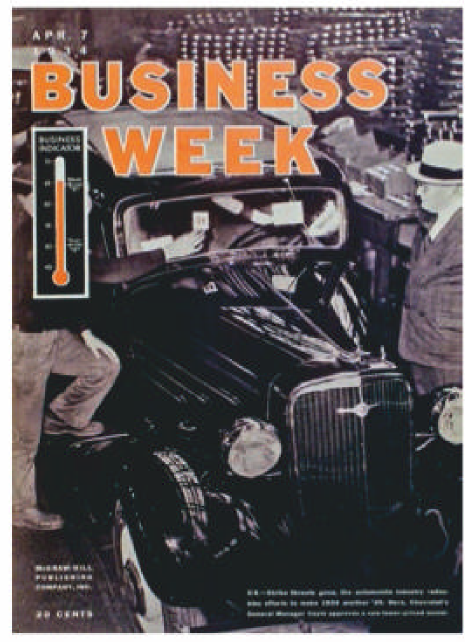
The first issue of this magazine appeared on Sept. 7, 1929. Its black, red, and gold art deco cover was free of news. It featured a big triangle pointing down at an inscrutable photo—an overhead, nighttime view of an intersection in an unidentified big city.

The editors obviously had no way to know that seven weeks later the stock market would crash, ushering in the Great Depression. They did observe that "the market is now almost wholly 'psychological'—irregular, unsteady, and properly apprehensive of the inevitable readjustment that draws near." But in the metaphorical style of the day, they also said, "There is no financial frost in the air as yet, and we look for a long stretch of Indian summer in industry before winter sets in." The first issue carried squibs on tariffs, railroads, farms, Palestine, and even this tech breakthrough: "Dry Ice Finds Many New Uses."

● 1931
McGraw-Hill, the magazine's publisher, moves into 330 W. 42nd St., a 35-story, blue-green masterpiece designed by Raymond Hood. Inhabitants liked to joke that it was like a pistachio: "Green on the outside, nutty on the inside."

How we've survived, thrived, and evolved from 1929 to 2019 is a sprawling tale. We've been shaped by each of the thousands of journalists who've worked here over the past nine decades, sweating every sentence, photograph, illustration, chart, and cover. We've also been shaped by every story we've done, from World War II to WeWork. We are 90 years old but still a perpetual newborn, created anew each week.

To say "we" is presumptuous of today's staff, since of course no one from 1929 is here anymore. On the other hand, there's institutional memory. Jim Ellis, the editor of our Business section and one of the authors of this essay, has been with the magazine since 1980. He overlapped for a few years with John Cobbs, who started in 1942. Cobbs in turn overlapped with Ralph Smith, editor from 1937 to 1949, who'd been with *The Business Week* from its beginning. So, just three people span our entire history.



● 1934
The Business Week becomes simply *Business Week*. (Editing at its finest!)

We've been through a lot of changes, right down to our name: first *The Business Week*, then *Business Week*, then *BUSINESS WEEK*, then *BusinessWeek*. And since 2009, *Bloomberg Businessweek*, as part of Bloomberg LP, which acquired us from the McGraw-Hill Cos.

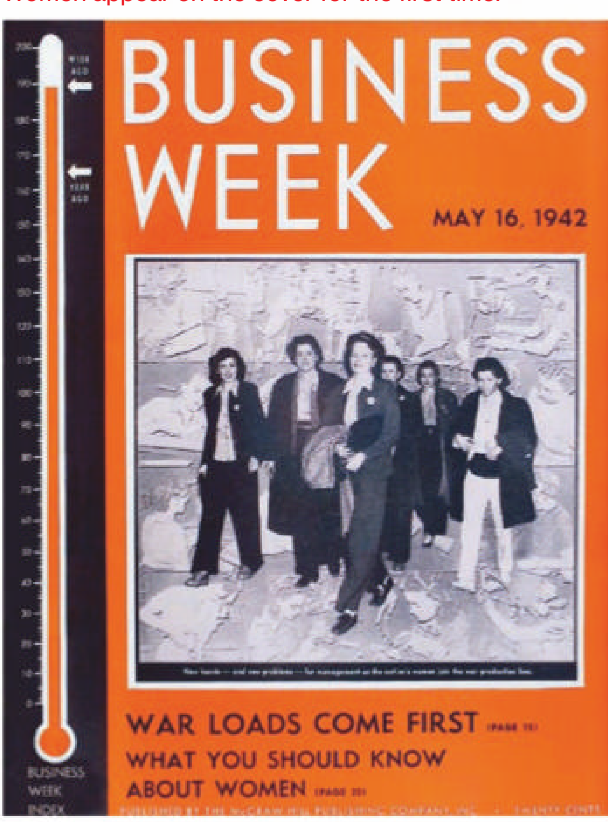
Our decade inside Bloomberg is an echo of our eight inside McGraw-Hill. At "Mother McGraw," *BusinessWeek* was the flagship publication, drawing on reporting from a network of specialty trade publications ranging from *Modern Plastics* to *Engineering News-Record*. At Bloomberg, the magazine's staff harnesses its 2,700-plus journalists and analysts, who work in 120 countries.

Something else has persisted: our mission. "Its ambition is to become indispensable," the editors wrote in the inaugural issue. "*The Business Week* never will be content to be a mere chronicle of events. It aims always to interpret their significance." That promise stands up pretty well today, as does our determination to serve you, our reader. If nothing else, our longevity suggests we've been doing something right on that score.

Not that we're always on the money. Even in the magazine's earliest days, the editors were slow to realize the economic carnage that was transpiring. ▶

▼ 1940s

● 1942
Women appear on the cover for the first time.



◀ As late as July 1930 we were still optimistically pointing to “a fistful of straw that show business winds have turned,” including record June sales of Packard automobiles. McGraw-Hill went ahead with plans for a blue-green art deco headquarters on Manhattan’s 42nd Street, moving into it in late 1931. (The landmarked building still stands, though it’s half-enveloped by the Port Authority Bus Terminal.)

But as the Depression gathered force, the editors turned into strong advocates for aggressive action to revive the U.S. economy. At a time when the U.S. Chamber of Commerce and others urged the federal government to balance its budget, *The Business Week* understood that the economy was suffering from a shortage of demand and that government was the only player capable of filling the gap. In October 1930 the magazine complained that the Federal Reserve was “standing idly by.” In March 1932 we condemned a consumption tax bill in the House as “fiscal suicide” that would cause “further deflation and contraction.”

It was one of the magazine’s finest hours. “*Business Week*’s editorials offered perhaps the most sophisticated Keynesian-style economic analysis of any mass publication, and its influence may have been disproportionate to its circulation, as it targeted an elite audience of businessmen,” wrote Ranjit Dighe, an economics professor at the State University of New York at Oswego, in a 2011 paper.

The probable author of those editorials, Virgil Jordan, was the first in a long line of brilliant economists and economic journalists to write for the magazine. Another was Leonard Silk, Ph.D., later a columnist for the *New York Times*, who wrote for the magazine from 1954 to 1969. Silk attempted to bolster readers’ trust in economists, writing in 1959 that the profession “has moved a long way toward the realism and practicality sought by business and government.” Silk hired William Wolman, a Stanford Ph.D. who continued to write and edit for the magazine until 2001. Wolman in turn hired Michael Mandel, a Harvard Ph.D. who became a theorist of the New Economy and stayed with the magazine until 2009.

Aside from chronicling the lousy economy, the *Business Week* of the 1930s helped invent the modern role of the chief executive officer. Writing about management became a staple of the magazine as the postwar explosion of new businesses and technologies called for a shift toward professional managers who had the analytical skills to quickly assume responsibility in unfamiliar enterprises. The archetype of this new uber-manager was General Motors CEO Alfred P. Sloan, whose data-driven approach became one of the most influential business strategies of the 1950s.

Sloan in 1950 donated more than $5 million to launch the graduate business school

● 1944
Freelance correspondent Roscoe Fleming notices a leap in uranium mining and asks a professor at the Colorado School of Mines what applications the element might be used for. The professor says, “Well, you could make a lot of paint, or a lot of china, or you might just blow Berlin off the map.”

● 1944
Business Week is forced to turn away advertising because of a paper shortage.

● 1947
Boyd France of Reuters swims out from a French port to interview Jewish Holocaust victims aboard the *Exodus 1947*, which the British had barred from landing in Palestine. The next year he joins *Business Week*, where he served as chief White House and State Department correspondent before retiring in 1986.

● 1948
Business Week covers the invention of the transistor at Bell Telephone Laboratories: “Makers of hearing aids, broadcasting equipment, electronic computers, and a host of other electrical goods will eye the new device.”

MINE: COURTESY LIBRARY OF CONGRESS. SCRAP POSTER: CHRONICLE/ALAMY. EXODUS: AP PHOTO. TRANSISTOR: COURTESY OF NOKIA BELL LABS. MENANDS: COURTESY TOWN OF COLONIE HISTORIAN

▼ 1950s

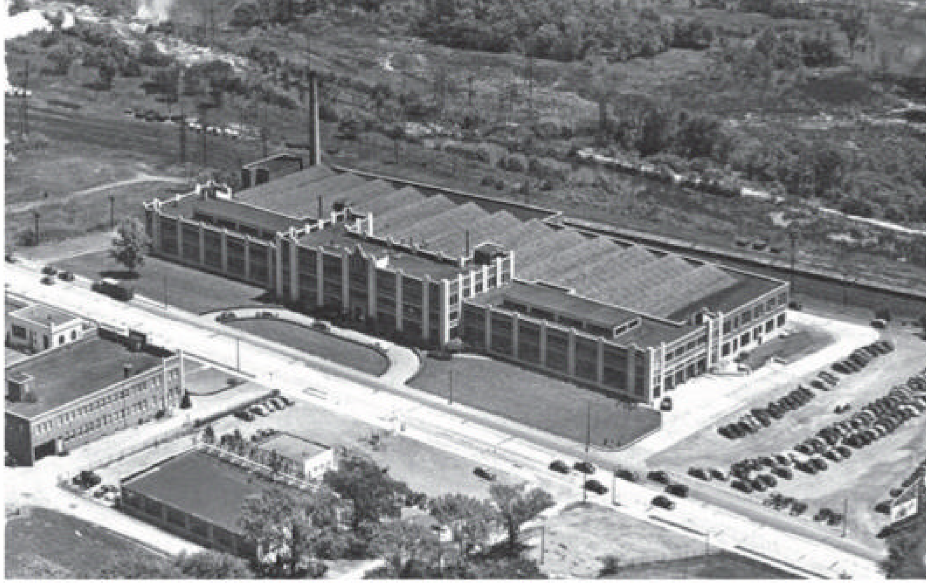
at MIT, back when formal management education was a novelty. *Business Week* was quick to recognize the huge importance of the shift. From the article "Can You Teach Management?" in April 1952: "The day of the truly professional general management man isn't here yet, but it's not far away." (The acceptance of professional women managers would take quite a bit longer.) Indeed, the rise in incomes and the amount of leisure time enjoyed by an increasingly suburban middle class meant money was to be made in new industries such as entertainment and travel, and professional managers-without-portfolio became a prized commodity. The magazine would play a modest part in their development, especially after the introduction of our annual business school ranking in 1988.

Business Week's coverage continued to evolve. A November 1951 issue examined the potential impact of color television. In August 1952 the headline of the magazine's cover story on the airline industry's plan to shift to jets asked, "How Big Can It Get?" A July 1955 cover story detailed the $17 million—yes, $17 million—bet Walt Disney Productions was taking to open the original Disneyland in Anaheim, Calif.

And an August 1958 cover story predicted that American Express Co.'s new national credit card would be "perhaps the closest thing yet to a 'universal' card adequate for all the needs of a traveler or stay-at-home host." That was almost a decade before BankAmericard (now Visa) expanded outside California and the founding of Master Charge (now Mastercard), but *Business Week* readers were already well aware of the potential for plastic to change American consumption forever.

Meanwhile, our writers and editors increasingly spent time tracking broader societal shifts that would have an indelible impact on business. One of the most striking was the inclusion of women. The magazine had put a group of female workers on its cover in May 1942 to illustrate the phenomenon of women entering the workforce to fill in for men during World War II. Soon a few female entrepreneurs would appear on the cover, starting with Hazel Bishop, the chemist-turned-businesswoman who developed the first nonsmearable lipstick, in 1951 and Tupperware saleswoman Brownie Wise three years later.

Then came our 1975 cover "The Corporate Woman: Up the Ladder, Finally," showing a confident General Electric Co. vice president, Marion Kellogg, seated in a black chair. The 11-page package by our Corporate Women department editors provided an inside look at the discrimination and slights, overt and subtle, that women experienced as they climbed the ranks in male-dominated businesses. ▶

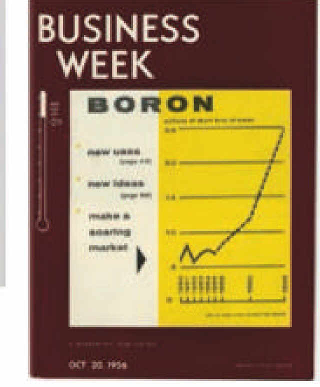


● 1950s
The magazine is printed 150 miles north of New York in the Albany suburb of Menands. Page layouts are sent up on a New York Central train out of Grand Central Terminal; galleys—long strips of newsprint—come back on another train. Before the blessing of computer-generated rubber type, "the proofreading, cutting, and adding and fitting took most of a day, with fixes and emendations transmitted by telephone" to Menands, recalls retired editor Eph Lewis.

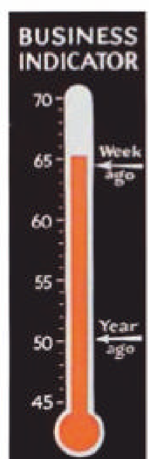
● 1950
Elliott Bell becomes *Business Week*'s chairman of the board of editors after serving for seven years as New York state's superintendent of banks. Bell was said to have been Thomas Dewey's choice for Treasury secretary if he'd been elected president in 1944 or '48, leading to the joke that *Business Week* was edited by "the greatest living non-secretary of the Treasury."

● 1954
Tupperware's top saleswoman, Brownie Wise, graces the cover.

● 1956
A cover story promises that boron is "poised for a burst of exciting new uses." Longtime staffer Jack Dierdorff, who started that week, later called the cover image "an artistic disaster even by the standards of 1956."



▼ 1960s



● 1961
We stop featuring a thermometer on the cover to indicate the "temperature" of the U.S. economy.

◀ "In situations where men say, 'This is what I want and deserve' and get a yes or no, a woman's requests are treated as demands," Sandra Kresch, then a 30-year-old vice president at consultant Booz Allen & Hamilton, told us. "People are surprised and ask, 'Why is she such a hard-driving lady?'" And there was the male executive who said many women weren't willing to make the sacrifices of working extra hours or accepting the tension that comes with being a senior manager. There were also encouraging signs of progress. "The big news is that women are making headway—slowly in the executive suite, faster at the lower rungs of middle management."

Business Week's coverage of African Americans' movement within corporations followed a similar fringe-to-mainstream arc. In the early days, coverage of black business was scant, and the magazine was at times painfully in step with the segregationist thinking of the era. A December 1944 story, "Negro Problem Worries Coast," said California cities were troubled by the large numbers of black workers who'd moved west to work in war plants and planned to stay: "There are Negroes who despise their 'ghetto' and others who like it—and profit by it," the story said.

circulation of the English-language edition was increased by 114 per cent.

Another circulation milestone was reached in January, 1966, when Business Week's circulation passed the half-million mark.

BUSINESS WEEK MILESTONE: At year's end, Business Week passed the half million circulation mark. To get a dramatic photograph which was used in a BW promotion ad, this special lighting was arranged.

11

● 1965
A photo in the McGraw-Hill annual report shows windows lit up in the shape of a 5 to celebrate our circulation reaching 500,000.

In the 1960s, the civil rights movement and nationwide unrest cast a harsh light on the inequity of the American dream. *Business Week* changed alongside America's racial dialogue, publishing stories throughout the decade about government efforts to jump-start black capitalism—seen by some policymakers as a way to calm frustrated demonstrators who'd taken to the streets—and profiles of nascent black businesses. The magazine's tone remained a work in progress: An April 1969 marketing story noted that "Negro-owned, operated American Dream Soap hopes to clean up with products aimed for the ghetto."

By the time *Business Week* published a September 1973 article about George E. Johnson and the success of his Chicago-based hair-care company, Johnson Products (headline: "When Black Is Beautiful"), the editors seemed intent on being more inclusive. Still, they were writing for an audience that was far from woke about the black experience. So when they quoted Johnson, whose company made Afro Sheen, joking, "I'd be shaking in my boots" if more blacks began adopting the hairstyle sported by singer Isaac Hayes Jr., *Business Week* had to explain to its mostly white readers: "Hayes is bald."

● 1968
Staff photographer P. Michael O'Sullivan, covering demonstrations at the Democratic convention in Chicago that August, is knocked down by cops. Police grab exposed film from his camera and pouch.

● 1966
Business Week on hedge funds in their earliest days: "Smart Wall Street investors are cutting their risk by going into hedge funds—a way to go both long and short, and get profits while protecting their capital."

Change happens only so fast, however. When a Xerox Corp. executive, A. Barry Rand, was interviewed in 1988 for our cover story "The Black Middle Class," he was quick to note that discrimination wasn't going away. "'The playing field has not been leveled,' argues Xerox's Rand, who runs a $4 billion unit with 30,000 employees. 'America is not color-blind. Race still matters.'" Rand, who left Xerox in 1999 to become CEO of Avis and later served as CEO of AARP before his death last year, could have said the same today.

DNC: AP PHOTO. MCGRAW-HILL BUILDING: RICHARD LEVINE/ALAMY

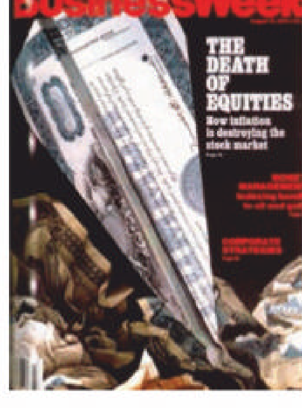
▼ 1970s

● 1972
In June, McGraw-Hill moves to a new 51-story tower on Sixth Avenue between 48th and 49th streets.

● 1975
Business Week begins a multiyear streak of leading all U.S. magazines in the number of pages of advertising per year.

● 1975
The magazine devotes a cover story to the Corporate Woman. The story receives a National Magazine Award, or "Ellie," for public service.

● 1979
American Express makes an unsolicited takeover offer for McGraw-Hill, which spurns it as "illegal, improper, unsolicited, and surprising."



● 1979
"The Death of Equities" actually looked pretty smart...for about three years. Then an epic bull market took off and turned our cover into a meme the internet has yet to forget.

While the 1960s and '70s expanded the economic pie and gave many people a political voice, the 1980s seemed to move in the opposite direction. Dozens of fights for corporate control were waged by a new class of business boogeyman or shareholder savior, depending on where you sat. These were "The Raiders"—junk-bond financiers and leveraged buyout kings—whom we personified with a March 1985 cover showing a pinstripe-suited executive wearing a red bandanna.

The 1988 fight over RJR Nabisco Inc. was era-defining. Henry Kravis's buyout firm Kohlberg Kravis Roberts & Co. mounted a $25 billion hostile takeover of the tobacco and food giant, then led by a cocksure F. Ross Johnson, who'd tried to take the company private in a sweetheart deal. KKR financed its counteroffer largely by borrowing against the company's assets, putting a little-known financial tactic known as the leveraged buyout on the map. Kravis landed on the Nov. 14, 1988, cover as "King Henry."

Possibly the most iconic character of the 1980s was Michael Milken, the wunderkind who led the junk-bond team at investment bank Drexel Burnham Lambert Inc. "Milken has devoted his career to a radical proposition: that the supposedly risky bonds of companies with low credit ratings actually are terrific investments. So far, he's been right," we wrote in 1985. (Many of his clients also became iconic figures, such as oilman T. Boone Pickens, casino operator Steve Wynn, and CNN founder Ted Turner.) Yet Milken's decade-long run as the most feared person in corporate boardrooms came to an end when he pleaded guilty to securities fraud, served 22 months in prison, and was barred for life from the securities business.

Elsewhere on Wall Street, Michael Bloomberg was "stirring up trouble," *BusinessWeek* wrote in its April 29, 1991, issue—the first time the magazine covered its future owner, whose namesake financial information service already had "estimated" sales of $140 million as well as some formidable competitors. "In contrast with his company's modest size," we wrote, "Bloomberg's aspirations might strike some as grandiose." And how about this kicker: "Bloomberg has already shown plenty of guts. Glory of the sort he craves may take a little longer."

Bloomberg's data wasn't the only thing changing Wall Street. With the end of fixed brokerage commissions in 1975, retail investors, driven by the replacement of traditional corporate pensions with self-directed 401(k) retirement plans, had become a phenomenon by the mid-'80s. The institutional investor "buy side" could finally go toe-to-toe with Wall Street's "sell side."

Online discount brokerages appeared, and mutual funds boomed. Charles Schwab Corp., through shrewd marketing and innovative technology, "lays out a sumptuous banquet of low-cost and imaginative investment programs, such as no-fee mutual funds, computerized stock trading, and specialized banking services," said a Dec. 19, 1994, cover story.

Consumer advocacy groups would also come into their own, ▶

▼ 1980s

◀ many of them founded by "Naderites," people inspired by Ralph Nader's indictment of the auto industry in 1965's *Unsafe at Any Speed*. These advocates became the moral conscience of corporations, whether said corporations liked it or not. Meanwhile, environmentalism came of age with the passage of the Clean Air Act in 1990, forged by deals between congressional Democrats, who "don't want to face the voters empty-handed" in an election year, and a Republican president, George H.W. Bush, who "wants to burnish his reputation as an environmentalist," according to a March 5, 1990, story. How times have changed.

And yet, not. History does seem to repeat itself. As the magazine wrote just a few issues ago, 2020 could be "the year of the great anti-trust reawakening." If so, it would arrive 36 years after the breakup of American Telephone & Telegraph Co. The U.S. had brought an anti-trust case claiming that Ma Bell had abused its monopoly over long-distance service and equipment. After a decade-long court battle, AT&T agreed to settle the case by spinning off the regional telephone companies, the seven Baby Bells, in 1984.

The magazine closely chronicled how that breakup brought chaos yet paved the way for young visionaries who foresaw how the telephone could provide voice, video, and data in one handset. Fifteen years later, a Nov. 22, 1999, article said "companies created out of the Bell System, including those since swallowed up, are worth about $810 billion today, vs. $59 billion before the breakup."

The telecom upheaval would soon mesh with the digital revolution. The same year as Ma Bell's dissolution, a 28-year-old Steve Jobs would introduce the Apple Macintosh personal computer. "Stores cannot keep Macintosh in stock; the waiting lists of eager customers are growing at many retailers," the magazine wrote in March 1984.

During Ronald Reagan's presidency, "deregulation" and "tax cuts" were the watchwords. This lured many companies for the first time to open lobby shops and make campaign contributions to influence legislation and policy. *BusinessWeek* in 1985 also opened its first dedicated Washington bureau—just in time, too. A savings and loan scandal erupted out of a soupçon of regulatory failures, legislative bloopers, and unchecked campaign contributions. The fallout lasted to 1995 and involved the closure of some 800 S&Ls at a cost to taxpayers of about $125 billion.

That debacle fed a disenchantment with Washington that, by late 1992, had "deteriorated into something more malignant—a deep-seated loathing," the magazine wrote, hitting an all-too-familiar theme. "The public seems to distrust all politicians and is determined to shake up the established order." Sometimes, nothing seems to change.

● 1980
Art Director Malcolm Frouman produces multiple sketches for each cover story.

● 1984
Stephen B. Shepard, who'd worked for *BusinessWeek* for a decade starting in the 1960s, becomes editor-in-chief after stints at *Newsweek* and *Saturday Review*. One of his first acts is to give bylines to writers. "The sad truth, as I saw it, was that the magazine, though deeply reported and solidly profitable, was in dire need of editorial change," Shepard later wrote.

● 1984
A November cover story, "OOPS! Who's Excellent Now?," reveals that many companies featured in the management bestseller *In Search of Excellence* were having serious difficulties just two years after its publication. (In an email, Shepard says that was the first cover of his editorship and it was "a big deal for me.")

● 1984
Steve Jobs sits Shepard down in front of a Macintosh and shows him how to use a mouse.

● 1988
Management Editor John A. Byrne launches the business school rankings, which turn into a mainstay. "Business schools believe in the discipline of the marketplace," Byrne recalled last year. "We thought, Why don't we grade them on pure customer satisfaction?" The first year, he said, "I literally sat in front of the TV night after night stuffing envelopes."

● 1988
The March 14 cover story says, "After years of hard-won progress, signs of stagnation are appearing."

COVER SKETCH: COURTESY MALCOLM FROUMAN. SHEPARD: TERRY HOURIGAN. GATES: ALAN LEVENSON

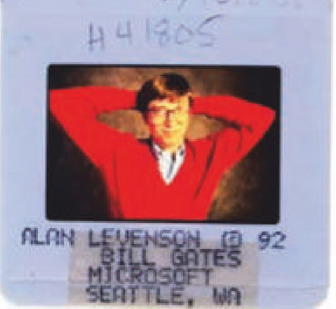
▼ 1990s

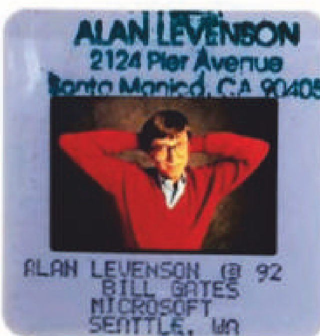
● 1991
A 216-page special issue on "The Quality Imperative," edited by Bob Arnold, becomes the magazine's biggest seller ever.

The heady American economy also powered through a scary stock market crash on Black Monday in October 1987, when the Dow Jones Industrial Average plunged 23%. The culprit would prove to be so-called portfolio insurance, which institutional investors had purchased to protect the value of the stocks in their portfolios. "The problem," as a Nov. 9, 1987, cover story put it, "is that these markets were not designed for the large institutions, which now dominate trading—especially when they all want to sell at the same time." Fortunately the stock market quickly recovered and continued its upward march, defying our infamous "Death of Equities" cover from 1979. (Oops.)

Perhaps the most consequential development of the '80s and '90s was the export of American-style capitalism around the globe. *BusinessWeek*'s European and Asian editions thrived on tales of peripatetic executives taking advantage of market-opening trade deals, delivering the message that free markets would yield good-paying jobs and higher living standards. The failure of communism as an economic and social model, made official by the fall of the Berlin Wall in 1989, gave U.S. companies a license to plant their flag in dozens of countries around the world. "New markets, rapid advances in communications, and new sources of brainpower and skilled labor are forcing businesses into their most fundamental reorganization since the multi-division corporation became standard in the 1950s," a Nov. 18, 1994, cover story said.

The U.S. economy entered and exited the 1990s with the wind at its back, interrupted by a brief recession in 1990-91, a brief war in the Persian Gulf in 1991, and not-so-brief spurts of corporate ▶





● 1992
In February, Microsoft co-founder Bill Gates appears on the cover, jumping. Amazon founder Jeff Bezos "was also playful," recalls retired photo editor Larry Lippmann. "At some point they found maturity and stopped playing for the camera."

● 1992
Real estate mogul Donald Trump comes to *BusinessWeek*'s headquarters in March with lawyers, threatening to sue over an article that estimated his net worth at a negative $1.4 billion.

● 1994
BusinessWeek Online becomes a feature on web portal America Online in December. Two years later, businessweek.com is launched.

● 1995
An October story on Bankers Trust's sales of derivatives to corporate clients is blocked from publication for three weeks by a federal judge. A federal appeals court declares the judge's restraint on publication unconstitutional.

● 1999
BusinessWeek, with a circulation of 1.2 million, is the world's most widely read business magazine.

● 1999
On Oct. 15, production manager Nicholas White is stuck in an elevator for 40 hours after taking a cigarette break. Once freed, he leaves the building and never returns.

▼ 2000s

● 2004
A December cover story declares that "the China Price" are "the three scariest words in U.S. industry. Cut your price at least 30% or lose your customers."

readers about leadership, compe

SUZY AND JACK Smart advice every other week

● 2006
BusinessWeek introduces former General Electric CEO Jack Welch and his wife, Suzy, as columnists, promising "blunt, get-it-done answers."

● 2009
BusinessWeek's finances worsen during the decade after the dot-com boom's profit surge. McGraw-Hill Cos. Chairman and CEO Terry McGraw (left) discusses a transaction with Michael Bloomberg in December. Bloomberg LP soon buys the magazine for an undisclosed price and renames it *Bloomberg Businessweek*. Josh Tyrangiel is hired as editor-in-chief.

◀ restructurings, downsizings, and mergers. The nascent digital revolution combined with healthy consumer spending, receding unemployment, and low inflation to produce what analysts called a Goldilocks economy. Foreign investors flocked to America. The European Union, partly in an attempt to mimic U.S. success, introduced the euro, its single currency. As the 21st century dawned, *BusinessWeek* sought to capture the new American prosperity and self-assuredness with a Feb. 14, 2000, cover story. It was titled, simply, "Boom."

Unfortunately, as in 1929, our timing wasn't so great: The dot-com bubble popped less than a month later. After a disastrous February initial public offering, Pets.com and its canine Sock Puppet mascot became memorable early casualties. By December, our body count was 75 "e-tailers." (One noteworthy exception was Amazon.com Inc. Jeff Bezos, we wrote that May, "isn't letting all the hand-wringing about Amazon's high-risk strategy get him down.") By the end of the year, the stock market had dropped almost 14% from its peak in March—and it had much further to fall, though there would be no moment lower than the tragedy of Sept. 11, 2001.

Yet barely a month after the Twin Towers fell, Jobs introduced the iPod, the digital music player that put thousands of songs in your pocket and synced with a computer program called iTunes, and Apple Computer Inc., whose shares were just $1.30 at the time, began its epic ascent. For a world still smoldering, here was a ray of hope, courtesy of a mock-turtlenecked entrepreneur-aesthete who knew a few things about second acts.

What followed is the stuff of legend: from iPod Shuffles to iPhones, Apple Stores to App Stores, Apple Watches to Apple TVs, Apple AirPods to, well, Apple AirPods Pro. "Jobs and his lieutenants parlayed their uncommon obsession with design and ease of use into an historic run," Bloomberg's Brad Stone wrote when Apple—by now just Apple Inc.—became the first U.S. company to pass a $1 trillion market capitalization in August 2018. (Another cover that makes us wince today: "The Fall of an American Icon," about Apple in 1996.)

It's easy to overlook the feat now, but the incredible evolution of technology since just the turn of this century has, in its finest moments, produced wonder. It's also produced anger, especially in the midst of Lehman Brothers' implosion and the ensuing financial crisis, which happened to hit especially close to home for the magazine. As we were to learn, Standard & Poor's was an enabler of the carnage that transpired and, like *BusinessWeek*, the rating company also happened to be a unit of McGraw-Hill. As our longtime owner's business turned dire, *BusinessWeek* changed hands—and proceeded to reinvent itself for the times with a dramatic redesign, becoming an early iteration of the magazine we are today.

From the beginning, *Businessweek* has covered the entire world. The earliest issues in 1929 warned that European employers were looking askance at Henry Ford's wage theories. The magazine covered the devastation of World War II and the miraculous postwar economic recoveries. It probed business opportunities in Latin America, Africa, and across Asia. It documented the rise of Japan and the even more dramatic rise of China. Hong Kong correspondent Joyce Barnathan and her co-authors even issued a prescient

MCGRAW: PATRICK MCMULLAN. PAULSON: HENRY LEUTWYLER/CONTOUR/GETTY IMAGES. POLLOCK: LARRY BUSACCA/GETTY IMAGES

▼ 2010s

warning in "Rethinking China," a March 4, 1996, cover story. "A pattern of disturbing behavior—from saber-rattling over Taiwan to strong-arming Western business—is causing concern about China's swiftly growing power," the subhead read.

Having lived through a few decades, we've seen bull markets like the present one before and know that, at some point it will end and, as we wrote last year, "we'll start by describing its demise"—the crash of 2020-something. Or maybe we'll get really lucky, like the Australians, who've been waiting 30 years for the next recession. But we digress. (At 90, I guess we are allowed to.)

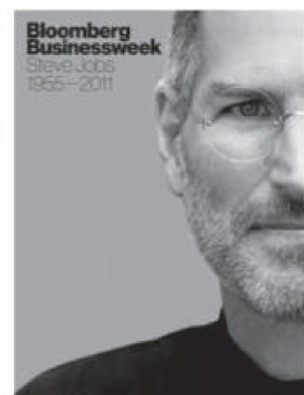
What's really been flowing through our veins all these decades, and something that's defined our coverage since the beginning of this century—especially during our time as *Bloomberg Businessweek*—is an obsession with innovation and change. It's why "Sooner Than You Think" became one of our favorite franchises, why our Emmy-nominated video series *Hello World* gets millions of hits on YouTube, and why we memorialized Jobs with a special ad-free issue upon his death. Ideas and insights—that's our currency.

The magazine has obviously long covered founders and CEOs, executives and management, industries and products. We've divided the staff into beats, and "the book" into corresponding sections. All of that was to organize the news, to tame the torrent of the times. We're first and foremost a U.S. magazine, yet we've also broadened ourselves into a global business publication, one with an American perspective that makes use of Bloomberg LP's best assets: valuable data and talented people. Beyond the print magazine, we're a big part of bloomberg.com; we also produce a TV show, a radio show, and a podcast; and we have millions of followers on social media.

We know we've been fortunate to live as long as we have. Which is why we want to say thank you—to you, our readers, as well as our staffers, contributors, advertisers, and anybody else we've ever touched. We value you and the time you give us, and we look forward to engaging with you for many more issues in the decades to come. Ⓑ

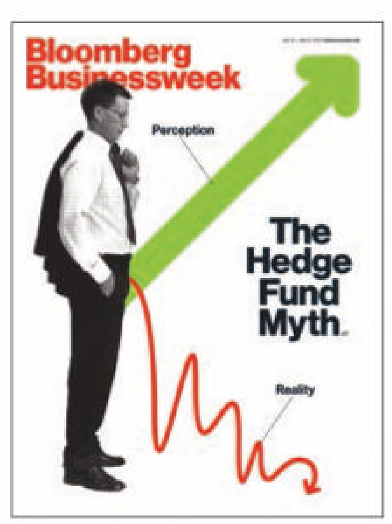
● 2010
Bloomberg Businessweek debuts on April 26. "We had a great redesign and a bunch of really terrible covers under glass," Tyrangiel recalls. "Then we got some breaking news about Goldman Sachs, so at least we looked relevant. But honestly? There was much better work to come."

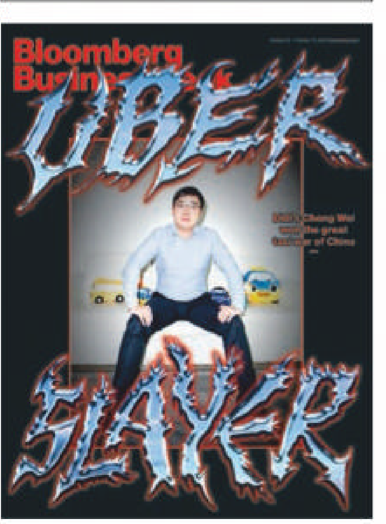
● 2011
Upon Steve Jobs's death, the staff throws away an entire issue before it prints and, overnight, cranks out a special one to commemorate him.



● 2013
Hank: Five Years From the Brink, a documentary featuring former Treasury Secretary Henry Paulson, commemorates the anniversary of the start of the global financial crisis.

● 2015
"What Is Code?" For the first (and still only) time, the magazine devotes an entire issue to one article, Paul Ford's 38,000-word essay on software and programming culture.





● 2013-16
"There was a time, around 2013–16, when the most experimental magazine in the world wasn't some Berlin fashion zine that doused its models in crude oil but *Bloomberg Businessweek*, a once-dowdy battleship of American journalism," says a publication of AIGA, the professional association for design.

● 2015
On Oct. 1, Ellen Pollock becomes the magazine's first female editor-in-chief.

● 2016
Silicon Valley correspondent Ashlee Vance in March launches an online video series, *Hello World*, that tours global tech hubs.

● 2018
Beginning with a *Businessweek* cover story, a multipart investigative series by Bloomberg News on the merchant cash-advance industry triggers probes by state and federal authorities and a law banning one of the industry's most abusive practices.

● 2019
Cover trail returns!

Celebrating the Longest, Calmest Bull Market Ever

By Lu Wang

At the start of the century's troubled teens, who would've predicted U.S. stocks would lock themselves into the longest bull market ever, setting record after record with unprecedented calm? Adjusted for risk—the price swings investors had to endure—gains in the S&P 500 index since Dec. 31, 2009, are poised to be the highest of any decade since at least the 1950s.

Stocks in the index have returned 252% in the past 10 years, about 1.2 times the historical average. And the 2010s were the first decade without a bear market, defined as a 20% drop from any peak. Sure, there were six 10% corrections, all hair-raising, but none were bull-killers.

A measure known as the Sharpe ratio shows the extent of the serenity. It tracks stock performance relative to Treasuries and stock market volatility. At about 1, the current reading is the best of any decade since at least Dwight Eisenhower's presidency, according to data compiled by Bloomberg. It shows that the returns, as good as they were in absolute terms, were even better considering how little they cost, so to speak, in sleepless nights.

The doesn't mean it was always smooth sailing. There was the May 2010 flash crash, Europe's sovereign debt crisis of 2011-12, and China's currency devaluation in 2015. Now a global trade war is renting psychic space in investors' heads. A lot of things that could've turned the world upside down kept flaring up.

For a visual sense of how it all felt, look at two gauges of anxiety. One is an index of the frequency of newspaper stories around the world mentioning uncertainty about economic policy. Unsurprisingly, it's shot sky-high over the past decade—yet has had surprisingly little effect on investors. Consider the Cboe Volatility Index, or VIX, a measure of S&P 500 options costs that shows how much volatility investors expect. While it's spiked from time to time, it's generally dropped back to low levels.

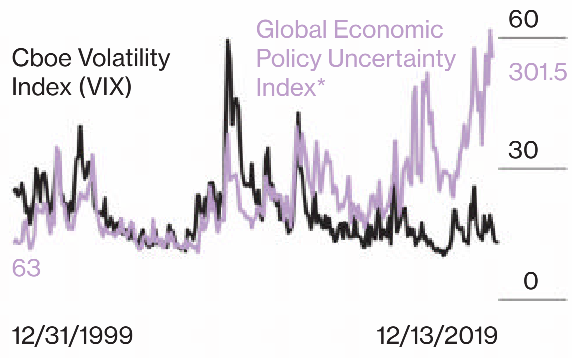
U.S. Stocks Have Had the Strongest Returns Relative to Volatility Since the 1950s

Sharpe ratio for the S&P 500

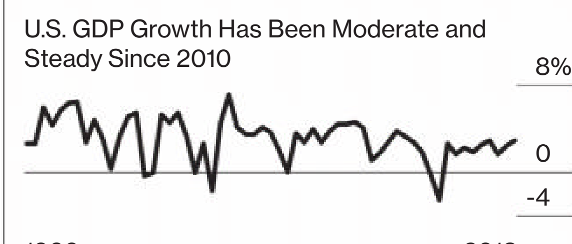
1960s	1970s	1980s
0.32	−0.03	0.52

1990s	2000s	2010s
0.98	−0.23	1.01

Uncertainty Is High, but Market Volatility Isn't



U.S. GDP Growth Has Been Moderate and Steady Since 2010



It all makes sense when considered alongside what central bankers have been doing. Almost every time something scary has hit the headlines, they've stepped in. The latest example: The Federal Reserve made a U-turn on monetary policy, embarking on a rate-lowering cycle after trade angst last year sent stocks down 9.2% in December, the worst for that month since the 14.5% drop in 1931. So growth scares have been just that: scares.

While perceptions of risk were high, fundamentals were stable. U.S. gross domestic product grew 1.6% to 2.9% in each of the previous nine years and is expected to do the same in 2019. Based on standard deviation, that's the smallest fluctuation over any 10-year stretch in data going back to 1930.

What's the message for investors in the long, lucrative calm after the storm of the financial crisis? "You should be aggressive when things look the darkest—that's clearly a lesson that works," says Bill Stone, chief investment officer at Avalon Investment & Advisory. "Of course, it's impossible to know that when you're running in real time." Ⓑ —*Wang writes about U.S. equity markets for Bloomberg News*

*WITH CURRENT-PRICE GDP MEASURES; DATA: BLOOMBERG, BAKER, BLOOM & DAVIS

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