Bloomberg Businessweek
December 5, 2022

When TikTok's Algorithm Turns Deadly

Children keep dying from the blackout challenge. Why isn't the world's most popular app doing more to protect them? 34

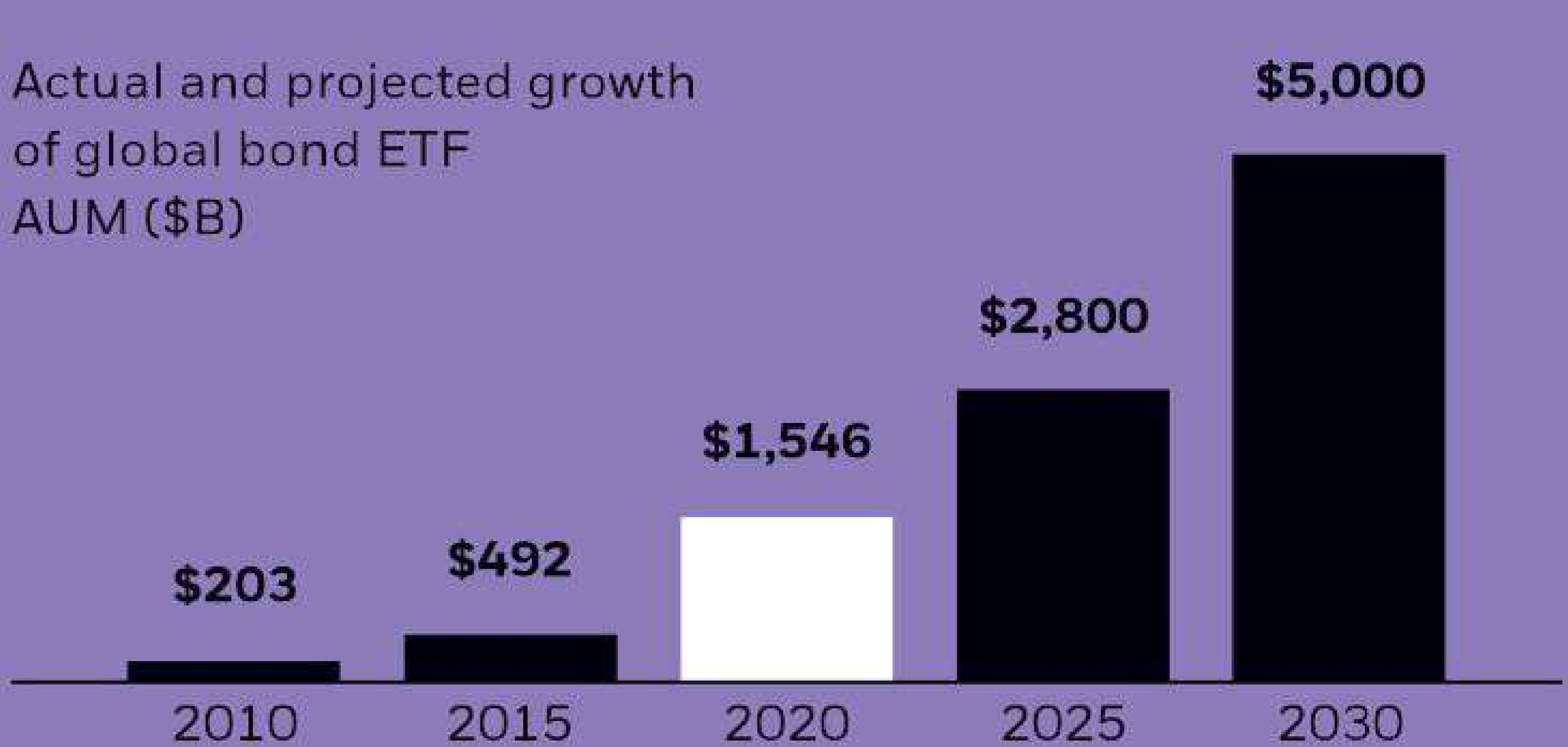
iShares by BlackRock

THE ONGOING EVOLUTION OF FIXED INCOME ETFs

Twenty years ago, computerized stock trading was reshaping the unseen market plumbing that connects buyers with sellers. The pace of change was slower in fixed income markets. Back then, individuals often had no way to get real-time price quotes for thousands of bonds. Big investors typically phoned bond dealers, hoped for inventory on hand, then negotiated terms. Buying or selling could be cumbersome and opaque.

Then, in the summer of 2002, iShares launched the first U.S.-domiciled fixed income ETFs, innovations that went on to break down barriers to fixed income investing.[1] Bond ETFs connected the fragmented fixed income markets with transparent and liquid on-exchange trading. For the first time, investors could buy a portfolio of bonds with the click of a button.

It was a point of no return. A movement that started with four iShares fixed income ETFs has grown into an industry with $1.7 trillion in assets under management (AUM).[2] Now, according to iShares, the global fixed income ETF industry is poised to reach $2 trillion in 2023 and projected to reach $5 trillion by the end of 2030.



Source: BlackRock projection as of May 1, 2020. Subject to change. The figures are for illustrative purposes only and there is no guarantee the projections will come to pass.

The trends accelerating ETF adoption

The world's largest institutional investors became among the fastest-growing adopters of fixed income ETFs based on the resilience and liquidity the products demonstrated in the early days of the pandemic.

According to a BlackRock analysis of SEC 13-F filings for the US, the 10 largest global asset managers all use fixed income ETFs.[3] Active managers who historically built portfolios exclusively with individual bonds are using fixed income ETFs as tools for liquidity management, portfolio efficiency and potential portfolio-level alpha generation. Managers are also increasingly using fixed income ETFs as risk management alternatives to futures or swaps, as cash and liquidity management instruments and as tools for large-scale portfolio transitions.

The growth of fixed income ETFs has helped drive advances in electronic trading and algorithmic pricing of individual bonds, which together have helped improve transparency and liquidity in underlying bond markets.

These advances are creating a virtuous cycle that enables more primary and secondary ETF market transactions and expands the number of individual bonds that can be priced and traded daily.[4]

From index tracking to precise exposures

The first fixed income ETFs largely delivered broad, index-tracking exposure to entire markets or asset classes. Newer fixed income ETFs break down asset classes into more precise exposures across credit, sectors, durations, sustainability and other risk factors. This increasing granularity allows investors to redefine their desired market exposure.

The next-generation precision fixed income ETFs will finally allow investors to think of portfolios not as lists of bonds, but as collections of risk that can be disaggregated and reassembled based on evolving market conditions, investment objectives and risk preferences.

Over 20 years, bond ETFs have become fundamental to fixed income investing. Their growth persists even in the face of challenging macroeconomic conditions. In fact, iShares believes the challenges associated with high inflation and rising interest rates will attract even more first-time ETF investors and prompt existing ones to find new ways to use these versatile investment tools.

[1] *iShares launched the first bond ETFs in the U.S. in July 2002 (LQD, SHY, IEF, TLT)*

[2] *BlackRock, Bloomberg, Morningstar (as of March 31, 2022)*

[3] *BlackRock analysis of self-reported holdings by asset managers in Europe and Asia. Top 10 global asset managers determined by Pensions & Investments in 2021.*

[4] *BlackRock, "The Next Generation Bond Market," July 2017.*

Carefully consider the Funds' investment objectives, risk factors, and charges and expenses before investing. This and other information can be found in the Funds' prospectuses or, if available, the summary prospectuses which may be obtained by visiting www.iShares.com or www.blackrock.com. Read the prospectus carefully before investing. Investing involves risk, including possible loss of principal.

Fixed income risks include interest-rate and credit risk. Typically, when interest rates rise, there is a corresponding decline in bond values. Credit risk refers to the possibility that the bond issuer will not be able to make principal and interest payments.

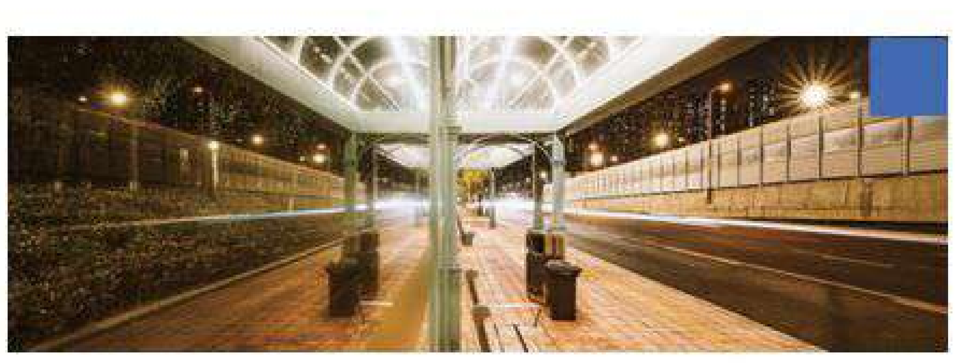
This material represents an assessment of the market environment as of the date indicated; is subject to change; and is not intended to be a forecast of future events or a guarantee of future results. This information should not be relied upon as research, investment advice, or a recommendation regarding any products, strategies, or any security in particular. This material is strictly for illustrative, educational, or informational purposes and is subject to change.

Prepared by BlackRock Investments, LLC, member FINRA.

What if →

you were a major transit system with billions of passengers taking millions of trips every year? You aren't about to let any cyberattacks slow you down. So you partner with IBM to build a security architecture to keep your data, network, and applications protected. Now you can tackle threats so they don't bring you to a grinding halt. And everyone is going places, thinking...

your cybersecurity kept an entire city ↪ on track?



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Bloomberg Businessweek

December 5, 2022

◀ Duo, a snarky owl, presides over a language instruction system that's more *Candy Crush* than Berlitz

FEATURES

PHOTOGRAPH BY ROSS MANTLE FOR BLOOMBERG BUSINESSWEEK

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■ COVER TRAIL

How the cover gets made

❶

"This week we've got a really scary story about TikTok and young kids, who aren't even supposed to be on the app."

[Yawning] "Funnily enough, I was up until 3:20 on TikTok last night and got a little lost. Apparently I'm capable of watching four straight hours of people making carbonara."

"Seems like the algorithm isn't any easier for kids to resist. And it's having some deadly results because of things like the blackout challenge."

"Oh, no. That's not where I wanted this to go."

"It's a dark one, unfortunately. I've seized all my kids' devices and locked down everything. They'll never know of the internet again."

Cover: Photo illustration by Justin Metz. Photos: Getty (1); TikTok (15)

ECONOMICS: PHOTOGRAPH BY SEPTEMBER DAWN BOTTOMS FOR BLOOMBERG BUSINESSWEEK


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Mapping the Electric Highway
Commercial electric vehicles are poised to own the roads in the coming decades, and Wells Fargo's equipment finance team is helping clients take their first steps toward that future. Along with the bank's relationship teams, they consult with clients about how to navigate the complex process of converting to electric fleets. Wells Fargo has a goal of achieving net zero by 2050 and helping clients with their green fleets is just a part of that goal.
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WELLS FARGO

IN BRIEF

● China is experiencing the largest and most widespread protests of Xi Jinping's presidency amid growing anger over the country's Covid Zero policy, which has left it stranded in a third year of mass lockdowns even as the rest of the world moves on from the pandemic. ▷ 16

The government has responded with a mix of concessions, including bolstering vaccination among senior citizens, and a massive police presence to quell unrest.

● Worldwide, there have been more than 643 million coronavirus infections, and

6.6m

people have died.

● EU authorities ordered Facebook parent Meta Platforms to pay a fine of

€265m

($276 million) for failing to prevent the leak of more than half a billion users' personal data. Meta said it had cooperated with regulators and made changes after the leak was discovered.

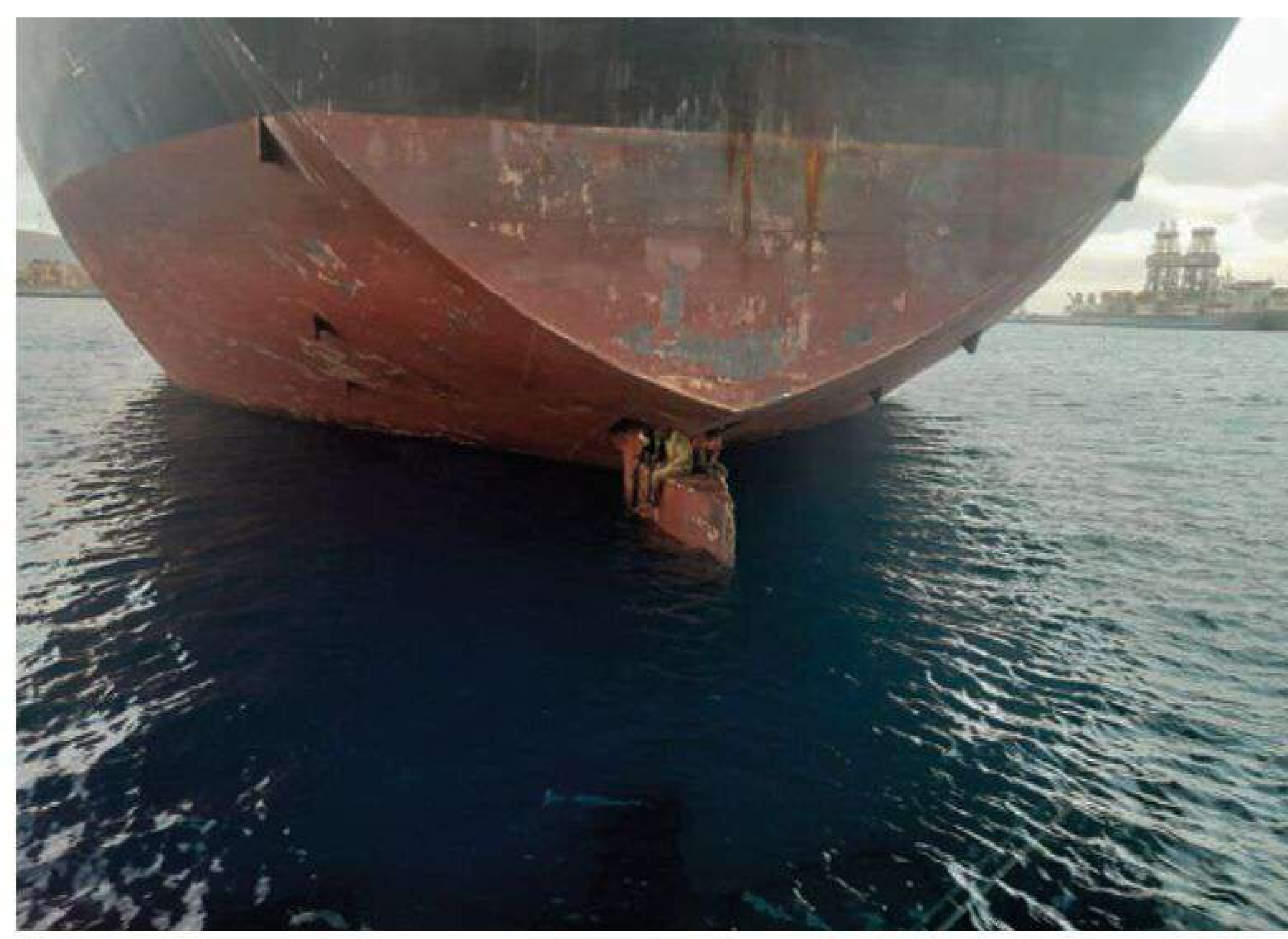
● BlockFi declared bankruptcy on Nov. 28.

The crypto lender is the latest digital-asset firm to collapse in the wake of the implosion of the FTX exchange, stoking worries that more corporate failures lie ahead. ▷ 8

● An Iranian general said more than

300

people have been killed in two months of nationwide protests against the country's restrictive religious policies, which erupted after a young woman died in detention. It's the first time an official has specified casualties from the government's clashes with demonstrators.



● Spanish authorities on Nov. 28 rescued three Nigerian men who'd traveled from Lagos to the Canary Islands—a 3,000-mile, 11-day journey—huddled on the rudder of an oil tanker. Europe is struggling to cope with record numbers of refugees fleeing conflicts and climate change in Africa, the Middle East and Ukraine.

● "We are the only country with experience of conducting a conventional war against Russia."

Ukrainian presidential adviser Mykhailo Podolyak sought to bolster his country's case for joining NATO during a two-day retreat in Bucharest, making an urgent plea as winter nears and Russia continues to shell power plants and other infrastructure.

● The US Senate voted on Nov. 30 to enshrine federal protection for same-sex marriages.

Democrats were concerned that the conservative Supreme Court could overturn a 2015 ruling establishing the right to same-sex marriage. But the final tally of 61 votes in favor—including 12 Republicans—suggests the once-divisive question has been settled.

● With unanimous support from the Democratic caucus, Hakeem Jeffries of New York was elected House minority leader. He becomes the first Black congressman elected to a top leadership post.

CHINA: THOMAS PETER/ALAMY. STOWAWAYS: SALVAMENTO MA/ALAMY. PODOLYAK: HENNADII MINCHENKO/GETTY IMAGES. JEFFRIES: BILL CLARK/GETTY IMAGES

China's Covid Zero Protesters Are Right. Xi Should Listen

The lesson Chinese President Xi Jinping drew from the fall of the Soviet Union is that leaders must show strength in the face of threats. Now confronting perhaps the greatest challenge to emerge during his rule, Xi should instead show flexibility.

Protesters took to the streets in several Chinese cities, including Shanghai and Beijing, to demand an end to the government's draconian Covid Zero policies; remarkably, some have called for Xi himself to step down. Although the demonstrations over the weekend of Nov. 26-27 were relatively small, that factory workers, university students and middle-class urbanites—in cities from the prosperous eastern coast to the Uyghur heartland of Xinjiang—have united around a single demand will worry authorities deeply. China has seen no similar movement since the 1989 crackdown in Tiananmen Square.

The weekend vigils were sparked by rumors—which local officials denied—that Covid restrictions had slowed firefighters battling an apartment blaze in the Xinjiang capital of Urumqi, leading to 10 deaths. Whatever the facts in that case, the demonstrations tapped into a deep wellspring of anger fed by the months of repeated testing, intrusive surveillance and suffocating lockdowns that have disrupted lives and derailed the economy.

Such frustrations have been rising at least since the beginning of the year, but officials have been hesitant to loosen restrictions. One reason is that only about two-thirds of older Chinese have received boosters—and then just of domestic vaccines rather than the more effective Western mRNA shots. China has only 64,000 intensive care unit beds for a population of 1.4 billion; an uncontrolled outbreak could lead to more than a million deaths. Xi was also loath to abandon a signature policy in the months before October's Communist Party congress, where he laid claim to a precedent-breaking third term.

Yet standing pat carries its own risks. Continued uncertainty will weigh on the Chinese economy, which is predicted to grow by a meager 3.3% this year. Health-care workers are too preoccupied with clamping down on outbreaks to ramp up vaccinations or build hospital capacity—both of which will be necessary before China can safely coexist with Covid-19. An extended period of instability might disrupt Xi's other priorities, such as reviving the ailing property sector and accelerating high-tech development.

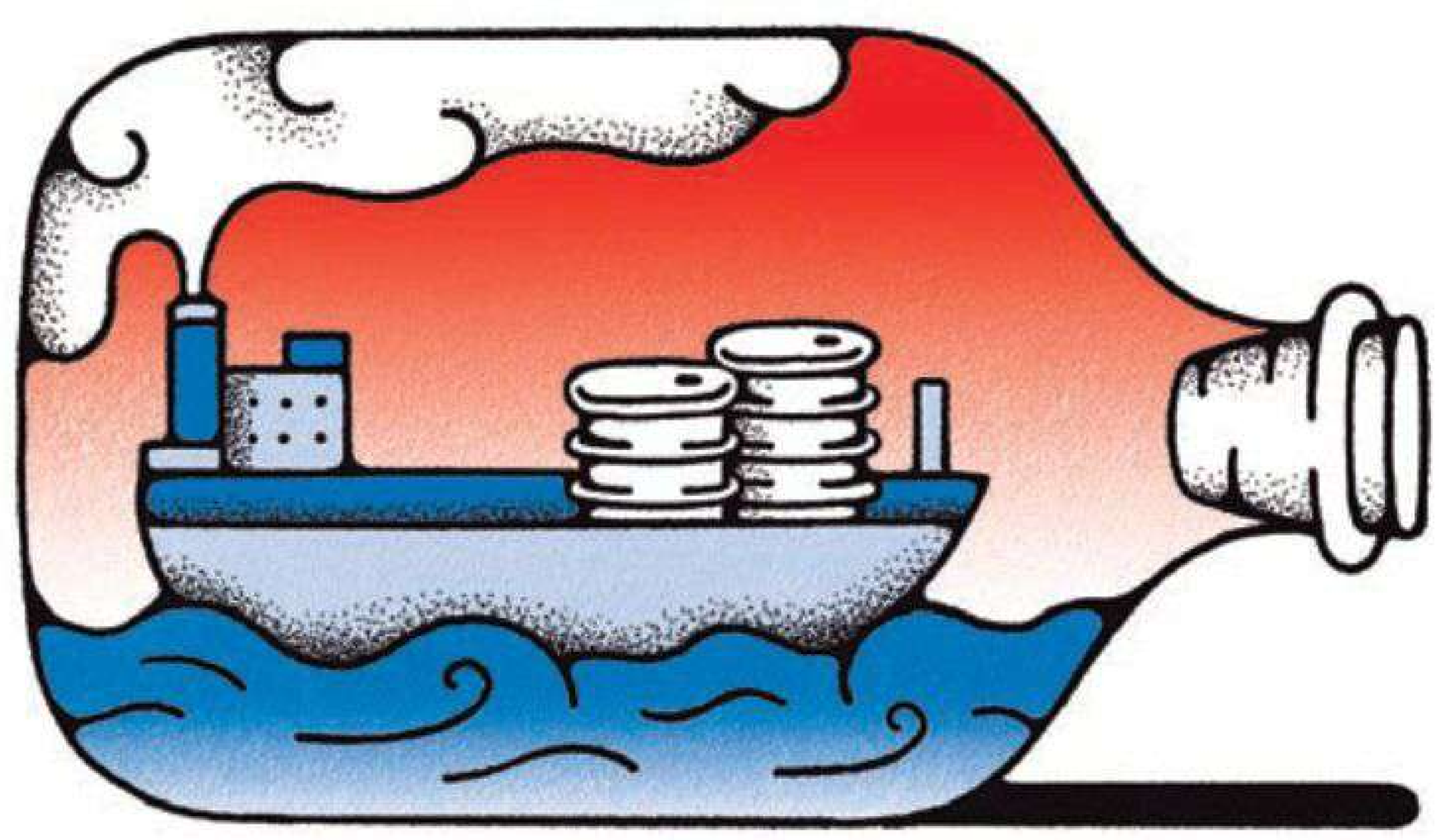
So what now? The government's attempts to refine Covid controls have failed because local officials are too fearful of being blamed for outbreaks. Chinese leaders would be better off sending a clear signal that the priority is to lay the groundwork to reopen safely. That will require raising booster rates among the elderly, preferably giving them access to Western vaccines. The government needs to stockpile antiviral medications and increase hospital surge capacity, including triage facilities to separate serious cases from mild ones, and allow for more patients to recover at home. Lockdowns should be limited and imposed only to prevent caseloads from overwhelming hospitals.

Most important, officials should present a more realistic picture of the virus's risks and the protection that vaccines provide. Xi must set the tone if the shift is to be convincing, perhaps describing the changes as a clarification of government policies that have confused lower-level officials. Any market rebound can be cast as a vote of confidence in the new approach.

At October's congress, Xi was hailed as the country's new "helmsman," an honorific previously reserved for Mao Zedong. He should show that he knows how to change course.

For more commentary, go to bloomberg.com/opinion

■ AGENDA



► Saying *Nyet* to Russian Oil

The EU is banning all imports of Russian seaborne crude and petroleum products as of Dec. 5, ratcheting up its sanctions against Moscow following the invasion of Ukraine. The UK and the US will institute a similar ban the same day.

► Turnout for Georgia's Dec. 6 runoff between Senator Raphael Warnock and Republican Herschel Walker has been setting records. Democrats are keen to pad their one-seat edge.

► After a seven-year run, Trevor Noah steps down as host of *The Daily Show* on Dec. 8 to spend more time doing stand-up. A yet-to-be-named replacement starts on Jan. 17.

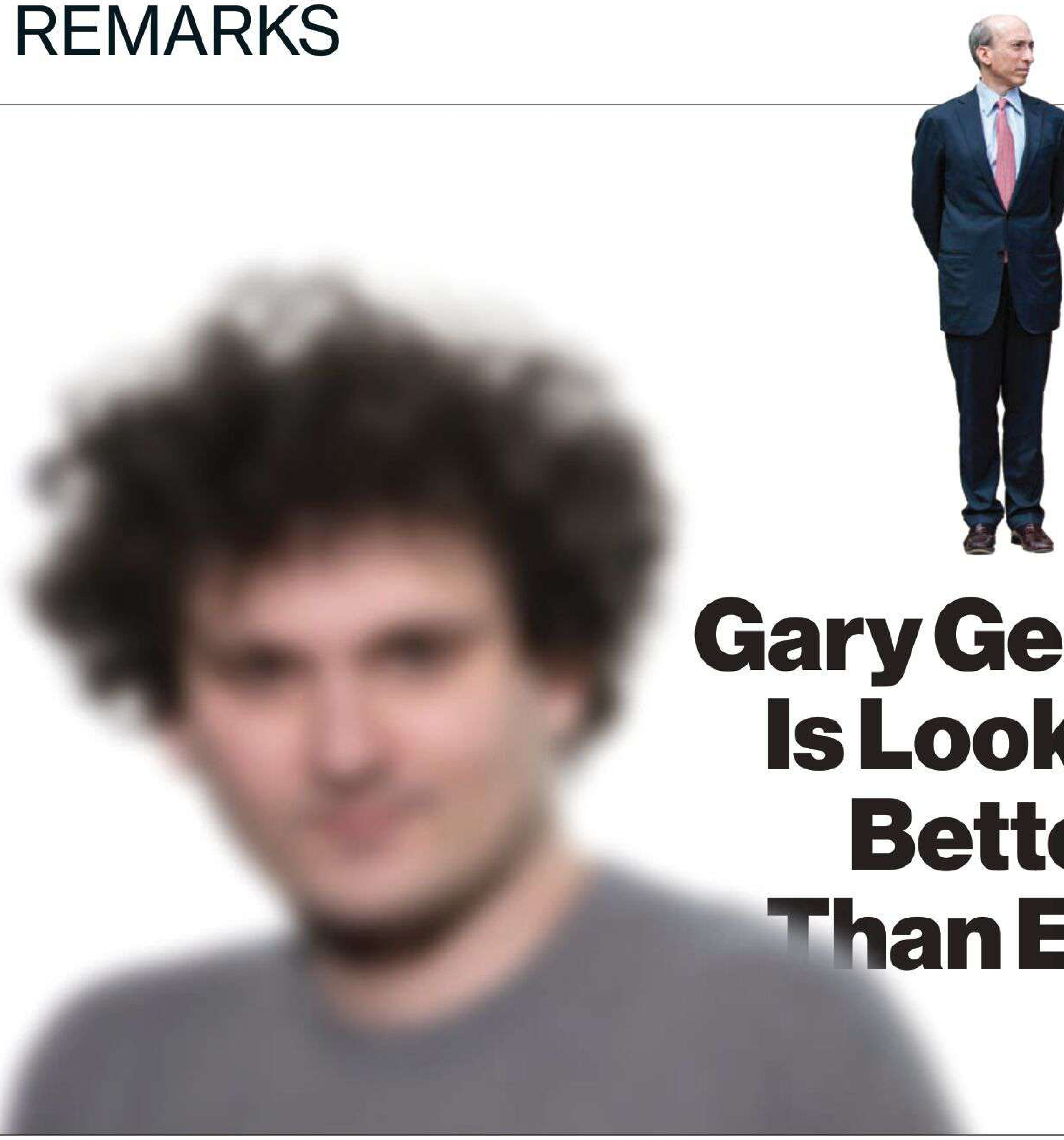
► Disney+ will introduce an ad-supported tier in the US on Dec. 8 at a monthly cost of $7.99, part of a pledge to make streaming a major focus for growth. ▷ 11

► Former Theranos President Ramesh "Sunny" Balwani will be sentenced on Dec. 7 for his fraud conviction, weeks after former CEO Elizabeth Holmes was given 11 years.

► After reaching the farthest distance from Earth ever achieved by a human-rated spacecraft, NASA's Artemis I is set to return from its lunar mission on Dec. 11 with a Pacific splashdown.

► The Nobel Peace Prize will be presented on Dec. 10 to three recipients: Belarusian activist Ales Bialiatski, Russian rights group Memorial and Ukraine's Center for Civil Liberties.

ILLUSTRATION BY BAILEY CROUCH



Gary Gensler Is Looking Better Than Ever

● Sam Bankman-Fried fooled a lot of people—but not the SEC chairman

● By Max Chafkin

If you want to apportion blame for the collapse of FTX, there are quite a few worthy candidates. Start with founder Sam Bankman-Fried, who under the banner of "effective altruism"—a 4chan thread of a moral philosophy—spent lavishly to lure investors onto his crypto trading platform and then, through greed or incompetence, allowed customer funds to be used, and lost, by a hedge fund he also owned, Alameda Research. (So far, Bankman-Fried has seemed to argue that this was an honest mistake stemming from a failure to keep track of customer funds. In other words: an $8 billion oopsie.) Caroline Ellison—chief executive officer of Alameda and Bankman-Fried's ex-girlfriend—is another worthy candidate, along with members of Bankman-Fried's inner circle.

If you were going to cast a wider net, you could also include the celebrities who took Bankman-Fried's money and used it to promote a business that might be best described as a "shitcoin casino." The television commercials that painted FTX as the future of finance, starring the likes of Tom Brady and Stephen Curry, were cynical in the moment. Now, with FTX in bankruptcy proceedings and federal criminal investigators circling, taking Bankman-Fried's money to suggest that normal people should quit their jobs and buy Dogecoin (in the case of the Brady ad) or that they consider crypto speculation as safe (per Curry) looks like a betrayal of trust, maybe even fraud, according to a recent lawsuit. Representatives for Brady and Curry didn't respond to a request for comment.

Then there's William MacAskill, the University of Oxford philosophy professor and bestselling author, who helped keep attention centered on Bankman-Fried's supposed good works rather than the predatory nature of a market full of pump-and-dumps and Ponzi schemes. If a moral philosophy that contends finance bros who donate to the right charities are doing more good than doctors and teachers wasn't dubious enough, the association with the FTX disaster should evaporate whatever misplaced respect effective altruism enjoyed.

There are other potential candidates for blame: the media, which published fawning stories about Bankman-Fried; the government of the Bahamas, which seems to have been enchanted by Bankman-Fried's largesse to the point of blindness; the US politicians who took FTX's money; and,

PHOTO ILLUSTRATION BY 731; PHOTOS: BLOOMBERG (1), GETTY IMAGES (1) of course, the crypto industry itself, which happily rode his runaway train of unearned praise.

In fact, there's perhaps only one person who looks good amid this fiasco: Gary Gensler, the top securities regulator in the US and arguably one of the only senior Biden administration officials who was trying to stop the excesses of the industry that Bankman-Fried and his enablers promoted. Since being sworn in as SEC chair, Gensler has warned, correctly it turned out, that many crypto tokens are being manipulated and has said that a host of crypto investment vehicles are being marketed illegally to consumers. In a speech in April, he said that crypto exchanges were also acting as market makers, "trading on their own platforms for their own accounts on the other side of their customers." This conflict of interest was at the heart of the company's collapse–and was one that critics had long pointed to as a potential problem, while most in the industry refused to take it seriously.

FTX was an "offshore" exchange. Because most crypto derivatives trading and leveraged betting is illegal in the US, it had chosen to locate itself in a friendly jurisdiction, while pressing to legalize the business via its American arm, FTX US. (Binance, the company's main competitor, has adopted a similar regulatory approach.) Gensler warned that offshore exchanges that allowed Americans to trade on them would be subject to SEC enforcement actions, which pushed exchanges to make it more difficult to open accounts from the US and kept more Americans from being exposed to Bankman-Fried's eventual failure. As a result, as bad as the FTX collapse has been for crypto speculators, the rest of the financial system has remained more or less untouched.

That was an achievement–as was Gensler's refusal to make it easy for crypto boosters to offload their tokens to retail investors, via crypto ETFs that gamble on spot prices (which the SEC has rejected) or savings account-style banking products that companies such as Coinbase Global Inc. attempted to offer to US consumers. In all these efforts, Gensler was pilloried by the crypto industry.

"Some really sketchy behavior coming out of the SEC," Coinbase CEO Brian Armstrong tweeted in September 2021, in response to the agency's refusal to bless the company's lending offering. Coinbase pulled the program under threat of a lawsuit, which was probably for the best. BlockFi, a similar lending operation, collapsed last summer and had to be bailed out by FTX. It's now bankrupt.

You might think that Armstrong would be sending a thank-you note to Gensler for keeping him and his customers out of this business. Instead, Armstrong is leading a brigade that's seeking, against all logic, to pin the blame for FTX on Gensler. The reasoning, which Armstrong laid out in a tweetstorm and in media appearances, is that Gensler created a "lack of regulatory clarity" by saying that many crypto tokens were in effect unregistered securities (in speeches and in a lawsuit that alleged insider trading by a former Coinbase executive). This, according to the logic of Armstrong and crypto luminaries who've echoed the argument, pushed speculators to offshore exchanges, depriving law-abiding American exchanges like Coinbase of potential profit streams and the US of this awesome new financial innovation.

All of which is nuts. If anything, what happened with FTX vindicates the position of Gensler and other skeptics. The lesson of the current crisis isn't that you should be able to trade your savings account for a high-risk banking product without FDIC insurance or that you should be able to use your 401(k) to buy Axie Infinity tokens. The lesson, as the antimonopoly researcher Matt Stoller has argued, is that Gensler and others were right to oppose these so-called innovations and that we should listen with extreme skepticism to arguments that portray crypto as inevitable and/or empowering.

The complaints about regulatory clarity are self-serving, a "desperate deflection," according to a recent paper by John Reed Stark, a former SEC enforcement official and a fellow at Duke Law School. Armstrong and others–including Bankman-Fried, whose political activities in Washington in the months leading up to the collapse centered on an effort to sideline Gensler–were essentially trying to change rules they didn't like. Today, when crypto boosters talk about "clarity," what they're asking for is the US government to approve an extremely risky type of speculation. A cynic might say that with crypto prices way down, they're also trying to offload tokens of questionable value to retail investors.

Moreover, the idea that confining crypto "innovation" to overseas exchanges is a problem is a highly debatable proposition. "That's a criticism leveled at any effort to regulate anything," Stark says. "It's hopelessly misguided." He points out that what makes American markets attractive to investors is that they're trustworthy and transparent. It's not clear that fully incorporating an industry that popularized terms such as "rug pull" and "pig butchering" enhances that position.

The incoming Republican Congress seems prepared to take the opposite position when it convenes in January. In early November, Minnesota Representative Tom Emmer promised to investigate Gensler's failure to rein in FTX. But, as the *American Prospect* reported later in the month, Gensler was investigating FTX and other crypto exchanges when Emmer and a group of other pro-crypto lawmakers sent a letter complaining about "overburdensome" queries from Gensler. At the time, Emmer was chairman of the National Republican Congressional Committee, which received $2.75 million from FTX through a PAC during the 2022 election cycle.

Despite what Emmer and other crypto boosters say, the answer to the FTX collapse isn't to blame Gensler or to change the securities laws to make it easier for American companies to offer risky products to consumers. It's to enforce existing laws that make fraud illegal. "The SEC is going to start charging these exchanges," Stark says. "And there are going to be criminal prosecutions."

That seems like a more sensible solution than the one favored by the crypto industry. "Regulatory clarity" shouldn't mean "blessing risky and potentially harmful investment products." Ⓑ

ILLUSTRATION BY NICHOLE SHINN

A New Avatar For the Mouse

Edited by David Rocks

● A sequel to the 2009 blockbuster will show whether Disney's $71 billion Fox purchase was worth it

On Dec. 6, London's Odeon Leicester Square theater is scheduled to light up for the premiere of *Avatar: The Way of Water*. As photographers jostle for a shot and fans clamor for autographs, stars Zoe Saldaña and Sigourney Weaver and director James Cameron will proceed down the red carpet for a screening of the sequel to the top-grossing movie of all time, which has booked sales of $2.9 billion since its release in 2009.

It's the kind of feel-good spectacle Hollywood adores, with hefty doses of glamour, glitter and magic to enthrall the public. *The Way of Water* has the potential to cast a similar spell on Walt Disney Co., helping the studio's bosses forget, just for a moment, how badly the pandemic upended their business. Disney got the rights to *Avatar* when it paid $71 billion for 21st Century Fox three years ago, and the franchise—Cameron is planning sequels every two years through 2028—"is certainly one of our biggest priorities since the acquisition," says Alan Bergman, chairman of the company's studio division. "The first film was one of the most important films ever released."

There's little doubt that the science fiction tale, following the story of a moon called Pandora and the colonization that threatens it, will attract a sizable audience. Adam Aron, chief executive officer of theater chain AMC Entertainment Holdings Inc., has said *The Way of Water* will be one of 2022's top-grossing films, approaching Paramount's *Top Gun* sequel, which has taken in close to $1.5 billion since May. On Twitter, Aron called the movie a "masterpiece" and a "likely huge hit."

What's less clear is whether the film will do well enough to warrant the price Disney paid for Fox. The deal, put together under Bob Iger—the past and present CEO who returned to the job in November—was at first deemed a clear winner for Disney, says Geetha Ranganathan, an analyst with Bloomberg Intelligence. During Disney's push into streaming in 2019 and 2020, Fox's rich catalog, ranging from *Bohemian Rhapsody* to *The Simpsons* to National Geographic fare, proved a strong draw for subscribers, thrilling shareholders.

Wall Street, though, has since started focusing less on streaming subscriptions and more on profitability. In its fiscal fourth quarter, the company posted a loss of $1.5 billion from the division that runs the Disney+ streaming service—spurring some investors to start questioning the deal. "Initially it looked like a slam-dunk," Ranganathan says. "Now it's a bit more up in the air."

During Iger's first run as CEO, from 2005 to 2020, serial acquisitions brought in an abundance of family-friendly programming. In 2006, Iger paid $7.4 billion for Pixar, giving Disney's aging animation operation a welcome boost. In 2009, Disney picked up superhero juggernaut Marvel Entertainment, then in 2012 it got Lucasfilm and its *Star Wars* series. Those deals have all proven to be bargains, with the last four *Avengers* films alone grossing almost double the $4 billion Disney paid for Marvel.

But the economics of *The Way of Water* are tougher. With a production budget that analysts say could be as high as $400 million, it's one of the most expensive movies ever made. Add in marketing expenses that can reach hundreds of millions of dollars for A-list films, plus deals that give theaters, Cameron and others a share of the take, and it's not hard to imagine Disney needing ticket sales approaching $1 billion before it earns a penny.

Disney declined to comment on the picture's financials or make Cameron available for an interview, but he told *GQ* magazine that *The Way of Water* was "the worst business case in movie history." To break even, he said, it would need to gross roughly $2 billion. And it's being released at a time when box-office receipts remain about a third below pre-pandemic levels as inflation and competition from the likes of Netflix Inc. and Amazon.com Inc.'s Prime Video keep film buffs glued to the couch.

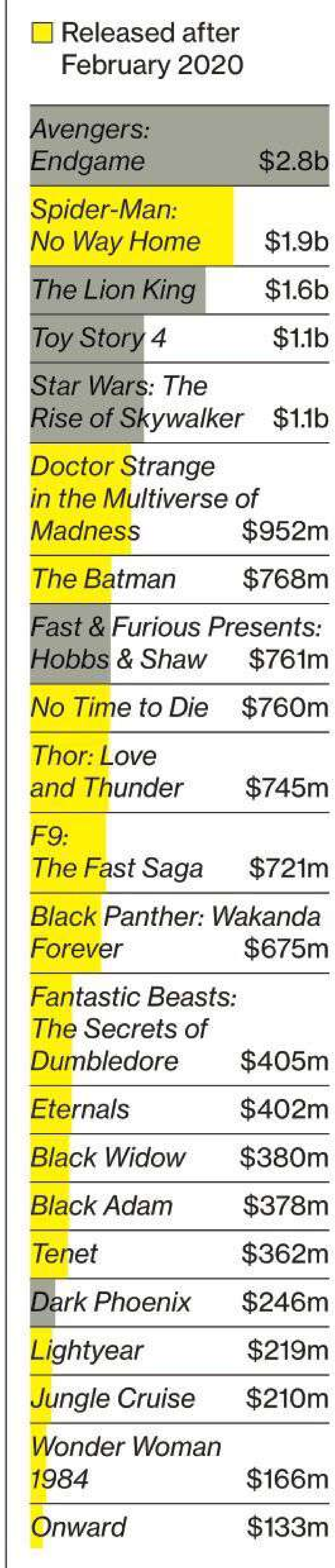
Disney's September rerelease of the original *Avatar* to theaters, aimed at building momentum for the sequel, sent a positive signal, taking in more than $70 million—respectable for a 13-year-old film. And big-budget productions such as *Spider-Man: No Way Home*, which has grossed close to $2 billion since its release last December, have proven that big-screen offerings can still find huge audiences.

A strong box-office showing for the *Avatar* sequel would help push perceptions of the Fox acquisition back into the win column for Disney—and provide a measure of validation for the board's decision to rehire Iger. Anything less than a megahit, though, will only raise more questions about the direction of Disney's overall strategy when its stock is down more than a third this year.

And no matter how the film performs in theaters, a big-budget franchise that provides just a few hours of content every couple of years won't do much for the longer-term prospects of the streaming operation. On Dec. 8 the company will launch an ad-supported version of Disney+ in an effort to diversify its direct-to-consumer revenue. To make that work, Disney must serve up programming that gives viewers a reason to come back again and again—perhaps with *Avatar*

● Iger

▼ Global box-office sales of big-budget films released from 2019 to 2022



IGER: DAVE J. HOGAN/GETTY IMAGES, LITHIUM: LUCAS AGUAYO ARAOS/GETTY IMAGES. DATA: THE NUMBERS, IMDB. MOVIES WITH ESTIMATED PRODUCTION BUDGETS OVER $200 MILLION. FIGURES AS OF NOV. 28, 2022 spinoffs such as those that build on *Avengers* and *Star Wars* characters, says Colin Dixon, an analyst with NScreenMedia. "They've got plenty of great, high-profile content that attracts people in," he says. "What they need is more bread-and-butter content to keep people there." —*Thomas Buckley and Felix Gillette*

THE BOTTOM LINE With a budget approaching $400 million, plus marketing expenses likely topping $100 million, Disney may need ticket sales of almost $1 billion to earn a profit on the *Avatar* sequel.

Lithium Heats Up

● As Ford and GM start financing miners, Tesla's dominance among suppliers is slipping

For years, only one customer mattered in the market for lithium and other metals used in electric vehicle batteries: Tesla Inc. The prospect that a new mine might end up feeding Elon Musk's automaker was enough to persuade cautious lenders to finance a project or convince investors that untested operations had a shot at meeting ambitious sales projections. And as the biggest buyer in a sector filled with startup miners, Tesla wielded unusual power to dictate terms, typically locking in long-term supply deals at fixed prices.

An aggressive push into electric vehicles by legacy car manufacturers, and worries over tight markets for lithium and other key materials such as nickel and graphite, is upending those dynamics. Ford Motor Co. and General Motors Co. have roiled the industry by striking generous pacts with prospective suppliers that include commitments to pay upfront for future deliveries or offer cheap loans to build new mines.

Tesla, by contrast, has resisted forming partnerships with suppliers in developing new operations, and Musk has repeatedly rejected proposals to acquire lithium companies or mines to lock in supplies, according to people familiar with his thinking. The increased competition has emboldened miners and refiners and is exposing Musk's reluctance to adapt his strategy, posing a threat to Tesla's plans to boost production, reduce costs and establish its own lithium refinery in Texas, according to the people, who requested anonymity to discuss private matters. Musk's lead in lithium is evaporating as rivals "stuff money into a bazooka and just blast it at the supply chain," says Chris Berry, president of House Mountain Partners, a battery-metals consultant. "Tesla can't throw their weight around in terms of negotiations." Tesla didn't respond to requests for comment.

Ford in June sealed a pact with Liontown Resources Ltd., which aims to build a mine in Australia, that included a A$300 million ▶

▼ Mining lithium in Chile's Atacama Desert

◀ ($204 million) loan from the automaker at favorable terms. Livent Corp., the No. 3 lithium producer, said in August that GM will pay $198 million in advance under a six-year agreement that starts in 2025.

Tesla in October ended months of negotiations with mine developer Core Lithium Ltd. without a contract for supply. Musk has rejected proposals for buying lithium operations in Australia, Canada and the US, according to the people. The company held talks in 2020 to acquire Cypress Development Corp., a US project developer, but didn't reach a deal. And across the industry, doubts are mounting about a deal Tesla struck two years ago to start getting raw materials from Piedmont Lithium Inc. by next summer while the miner chases approvals for a project in North Carolina.

With lithium demand expected to jump more than fivefold by the end of the decade, EV sales targets for 2030 are probably unachievable because of constraints on various raw materials, according to Piper Sandler & Co. New lithium mines can cost as much as $1 billion and take more than six years to build, too slow for the sector's needs, Piper analysts wrote in a November note. And BloombergNEF predicts shortages of lithium will be a problem until 2026 for companies that refine the products into chemicals used in EV batteries.

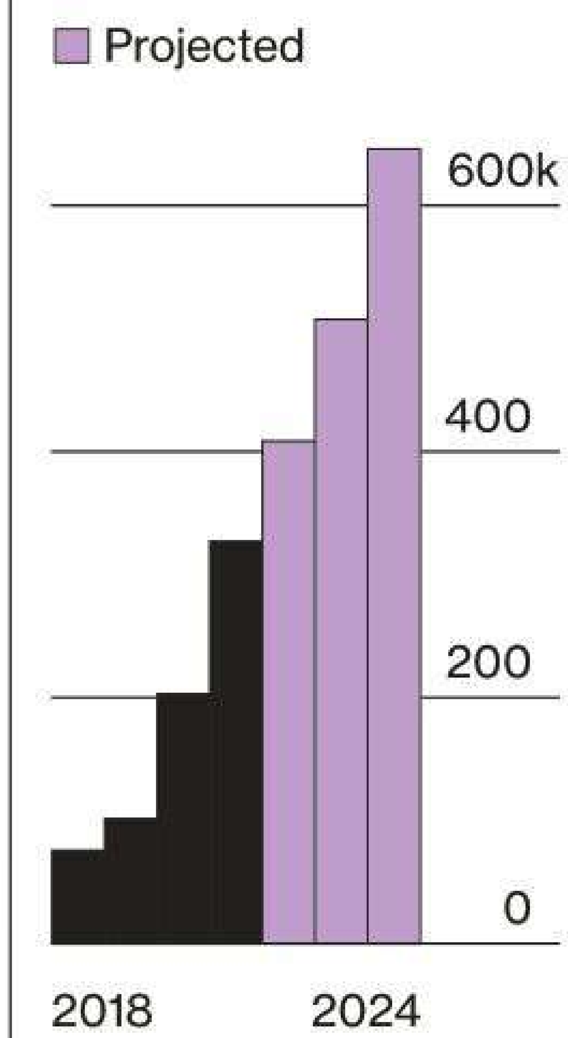
That's pushing lithium prices to new records. "It's quite important for us to play the right game," says Gareth Manderson, Core Lithium's chief executive officer. "We wouldn't be doing the right thing by our shareholders if we didn't ensure that we were getting the best pricing." Investors are increasingly focused on details of pricing in supply pacts, and they now see as much value in deals with Ford, GM, Mercedes-Benz Group or Toyota Motor as they do with Tesla, he says.

GM, which sold more than 6 million vehicles worldwide in 2021, has said it will be able to produce 2 million electric cars annually by 2025. Ford aims to do the same by the end of 2026, and Volkswagen AG has earmarked €52 billion ($54 billion) through 2026 for EV-related projects. Yet Tesla still dominates, delivering almost 1 million cars last year and predicting annual capacity approaching 5 million by 2025. The company in 2021 used about 42,000 tons of lithium carbonate equivalent—or more than five times the combined consumption of Ford and GM, according to calculations based on BNEF data.

Tesla's immediate future looks secure. In a May filing, the company disclosed it has supply agreements with four major players: US-listed Albemarle and Livent, and China's Ganfeng Lithium and Sichuan Yahua Industrial Group. And there are some signs Tesla might be willing to adjust its stance on partnerships; a pact with nickel producer Prony Resources included a pledge of technical support for a mine in New Caledonia.

Musk has often sought to downplay worries about supplies of lithium—used in every type of EV battery—once even dismissing it as "just the salt on the salad." Two years ago he promised shareholders he'd use mining rights acquired in Nevada to begin producing lithium with new, more sustainable methods. But little progress has been made, and the Tesla CEO continues to harbor doubts about directly entering a mining industry that wrestles with complex environmental challenges and routinely struggles with cost overruns, according to one of the people familiar with his thinking. Add it all up, says Joe Lowry, founder of advisory Global Lithium LLC and a former industry executive, and Tesla risks running into supply constraints as competition intensifies. "Elon's star power has hit its limit," he says. "They're gonna be short just like everybody else." —*David Stringer, Yvonne Yue Li and Gabrielle Coppola*

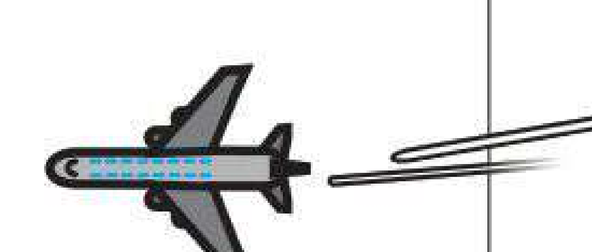
▼ Lithium needed for car batteries, in metric tons



THE BOTTOM LINE Demand for lithium is on track to jump more than fivefold by the end of the decade, so automakers will struggle to achieve their 2030 sales targets for battery-powered cars.

Discount Airlines Need Not Apply

● Low-cost carriers are abandoning Germany, citing sky-high fees they say favor Lufthansa



Over the past two decades, discount airlines Ryanair Holdings Plc and EasyJet Plc have followed the same playbook in Germany that they've used across Europe: From smaller regional airports such as Memmingen in Bavaria and Luebeck on the Baltic coast, they grabbed market share with ultralow fares that appealed to tightfisted travelers undaunted by their no-frills offerings. Over time they expanded to Berlin, Frankfurt and Munich, increasingly treading on the turf of the German flag carrier, Deutsche Lufthansa AG.

These days the upstarts are on the defensive as Lufthansa punches back. EasyJet quit the popular Frankfurt-Berlin route in 2020, and this year Ryanair abandoned Frankfurt altogether, saying the sky-high landing and terminal fees at Germany's biggest

ILLUSTRATION BY 731. DATA: BLOOMBERGNEF

airport—operated by a company partly owned by Lufthansa—rendered service there unprofitable. Post-pandemic, Ryanair's seat capacity in Germany has fallen by almost half, whereas in Italy it's up 40%, according to researcher Cirium. EasyJet has cut its Berlin-based fleet by more than two-thirds, to 11 aircraft, while in Lisbon it's added nine jets, up from zero.

As Europe's largest economy becomes a no-fly zone for low-cost carriers, its aviation market has rebounded more slowly than other places on the continent. Traffic in some major markets now exceeds pre-pandemic levels, but in Germany it's about 75% of what it was in 2019. In many smaller cities it's not even a quarter of its peak, pushing regional airports to the brink of bankruptcy and crimping tourism.

Lufthansa has held its ground via control of more than two-thirds of slots in Frankfurt and Munich—far more than what British Airways and Air France have at their London and Paris bases. On domestic routes, Lufthansa and its low-cost subsidiary, Eurowings, have a near-total monopoly, so there's scant incentive to lower fares. A two-week advance-purchase ticket for Frankfurt-Munich, flown by Lufthansa alone, costs €349 ($360). Fares for London to Edinburgh, a similar distance served by three airlines, start at £56 ($67). Comparison site Idealo says Lufthansa is increasing its average ticket price by 40% for next summer, more than any other major European airline.

After Lufthansa took over most of what was left of discounter Air Berlin in 2018, Germany's competition watchdog concluded that the carrier had used its dominant position to raise prices. But it said it didn't have the authority to review the case and impose penalties because EasyJet also picked up some aircraft and landing slots as part of the Air Berlin demise—an expansion that's since fizzled. "The market is set up to protect Lufthansa," says Dara Brady, Ryanair's marketing chief. "It's the German customer that gets screwed."

In principle, the European Union should be an aviation free-for-all, with the bloc's carriers allowed to operate domestic flights in any country. That's helped EasyJet, Ryanair and Wizz Air Holdings expand across the continent, forcing incumbents such as British Airways and Air France-KLM to cut prices or scale back. But during the early pandemic lockdowns, Lufthansa got a €9 billion government lifeline to help it limp along when most of its fleet was grounded, while nothing of that scale was available to EasyJet or Ryanair. After repaying the funds, Lufthansa is switching back to growth mode and seeking to hire as many as 20,000 new employees.

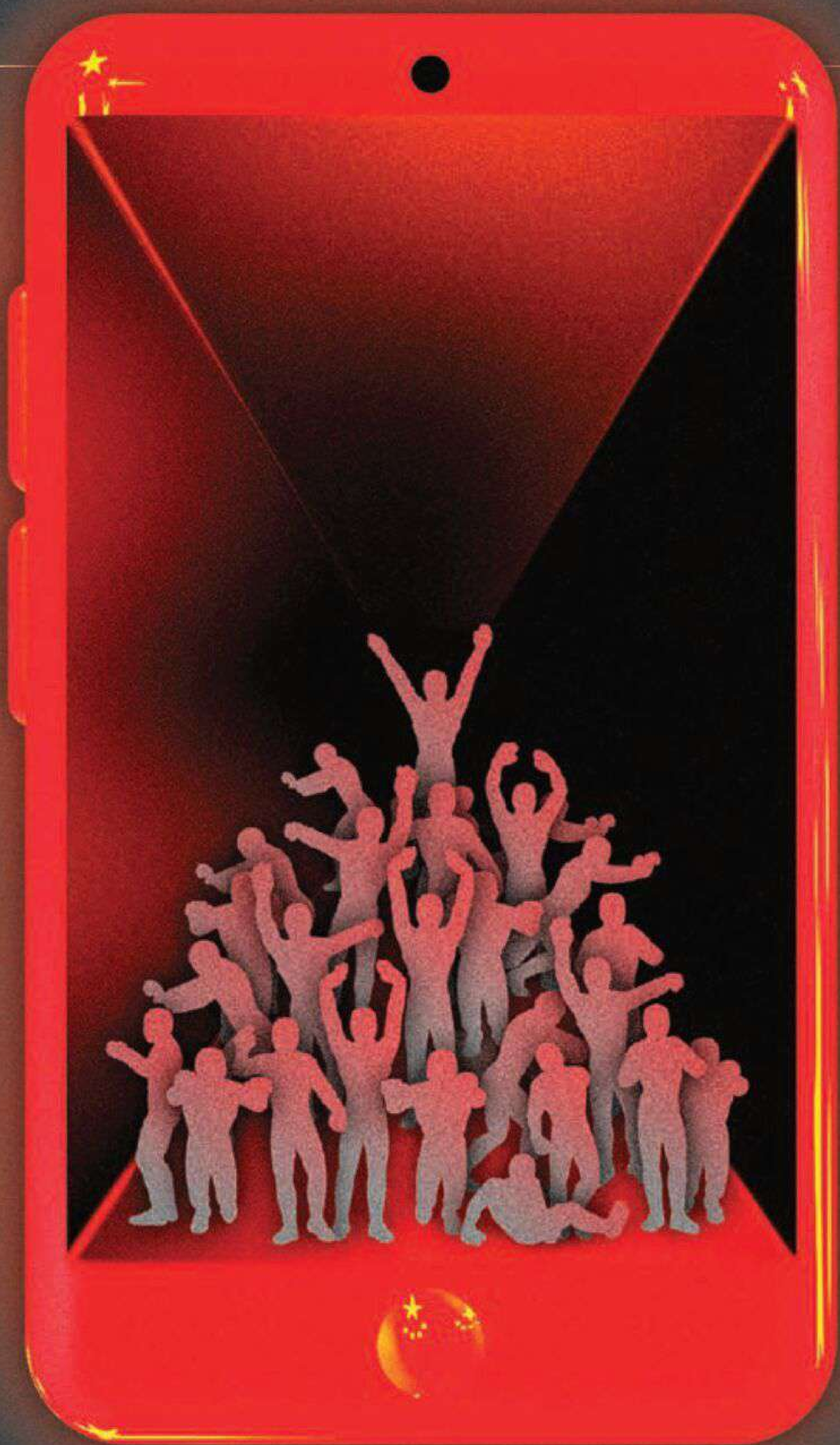
Germany's airport fees and taxes are the highest of the EU's four biggest markets, according to researcher RDC. It costs 13% more per passenger for single-aisle planes to land in Munich or Frankfurt than the average of major European hubs, while the cost at Germany's secondary airports is more than a quarter higher than the average for similar facilities, RDC says. And Germany has no significant lower-cost alternatives to the primary airports in its biggest cities, unlike Ryanair's stronghold at London Stansted or EasyJet's hubs at Luton and Gatwick.

Lufthansa also relies on its Eurowings brand to fend off the low-cost carriers. While the operation has run at a loss, Lufthansa uses it to maintain prices at a level that, when combined with high taxes and fees, makes it more profitable for discounters to shrink their German operations and deploy their jets elsewhere. Budget airlines initially predicted the low-cost effort would founder under the weight of corporate bureaucracy, says Lufthansa Chief Executive Officer Carsten Spohr. "They laughed at it," Spohr said

on an October earnings call. "But it's proved an immensely effective tool."

It's not just short-haul routes that are affected. Emirates, the largest international airline, has sought landing slots in Berlin for more than a decade, but authorities have said it can get them only by abandoning one of the four other German airports it serves. That's not an option, says Emirates President Tim Clark. "We said, 'Which one would you like us to give up?'" Clark told reporters in Berlin in November. "'And would you make your peace with the people who are deprived of our services?'" —*William Wilkes, with Monica Raymunt*

THE BOTTOM LINE While traffic in other countries has fully recovered from the pandemic, it's at about 75% of 2019 levels in Germany—and in smaller cities it's less than a quarter of its peak.



Covid Chaos

● Labor protests at China's main iPhone production facility highlight Apple's risks in the country

Xiao Han was just wrapping up the weeklong quarantine that marked the beginning of his latest stint working at the sprawling manufacturing complex in Zhengzhou, China, known as iPhone City, when violence erupted there. A large part of the 200,000-person workforce had already spent weeks living in forced isolation in trash-filled dormitories, subsisting on meager rations because management wanted to keep churning out Apple Inc. devices while squelching a Covid-19 outbreak. On Nov. 23 hundreds of workers, angry to learn they might not get the extra pay they'd been promised, pushed past the security staff guarding their living quarters, setting off a physical confrontation with riot police.

"It was total chaos. I'd never expected things could go this bad," says Xiao, who adds that some of his co-workers were injured in the clash. He describes a situation that had grown intolerable even before the violence. The 30-year-old was

Edited by Joshua Brustein and Stacie Sherman

ILLUSTRATION BY SHIRA INBAR. DATA: IDC

part of a wave of workers who abandoned iPhone City in October as conditions deteriorated. But he returned in mid-November, lured by bonuses intended to convince exhausted workers that things were improving. The violence showed how inadequate that effort was and also exposed the increasing futility of China's Covid strategy. Widespread protests over the government's approach to the pandemic broke out in late November, following a fatal fire in Urumqi, the capital of Xinjiang.

Throughout the pandemic, the Chinese Communist Party has shown a willingness to go to extremes in its efforts to combat Covid, locking down whole cities to stem infections. At the same time, it's pushed companies such as Foxconn Technology Group and Tesla Inc. to cut off their facilities from the outside world so they could continue to operate without interruption.

Taiwan's Foxconn, Apple's main manufacturing partner, operates iPhone City independently. It's acknowledged mistakes in managing the employees, while blaming local officials for unpredictable policies that made meal delivery and maintenance almost impossible, according to a person familiar with the company who asked not to be named discussing private matters. Local authorities didn't respond to requests for comment. Foxconn apologized for an "input error" that may have made it appear as if some staff were paid less than promised, adding it would stand by contractual obligations.

The troubles at iPhone City have drawn significant attention because of its prominence and size. But Foxconn's struggles suggest that other companies may be having even more trouble operating within China's parameters. "You see cases like Foxconn, and every company is now asking themselves, 'Will that happen to me?' " says Alicia Garcia Herrero, chief Asia Pacific economist at Natixis. "Any company that depends on manufacturing has to consider alternatives." The Zhengzhou plant is the world's largest iPhone factory, making its continued operation critical for Apple. The turmoil there is likely to result in a shortfall of almost 6 million iPhone Pro units this year, according to a person familiar with assembly operations. If lockdowns persist, production could be set back further. A spokesperson for Apple said in a statement that the company had staff members at the Zhengzhou facility and was "reviewing the situation and working closely with Foxconn to ensure that their employees' concerns are addressed."

Assembly partners such as Foxconn are making more iPhone 14s in India than any previous generation and are beginning to use the country as an export base. Foxconn is also expanding in Thailand and Vietnam, a sign of how President Xi Jinping's Covid policies are threatening China's economic growth. "It's very telling that a company like Foxconn is already moving into other countries," Herrero says.

Xiao has helped make iPhones for more than a decade, laboring 10 hours a day as production cranked up for a new model. In early October he heard rumors about Covid infections at the campus. Soon after, Foxconn began asking workers to take designated commuting routes every day and stop any private gatherings, according to company announcements and workers inside the campus. Yellow plastic barriers about 2 meters (6½ feet) tall were set up along roads to create lanes for workers to commute between dorms and the factory, but the restrictions were often violated.

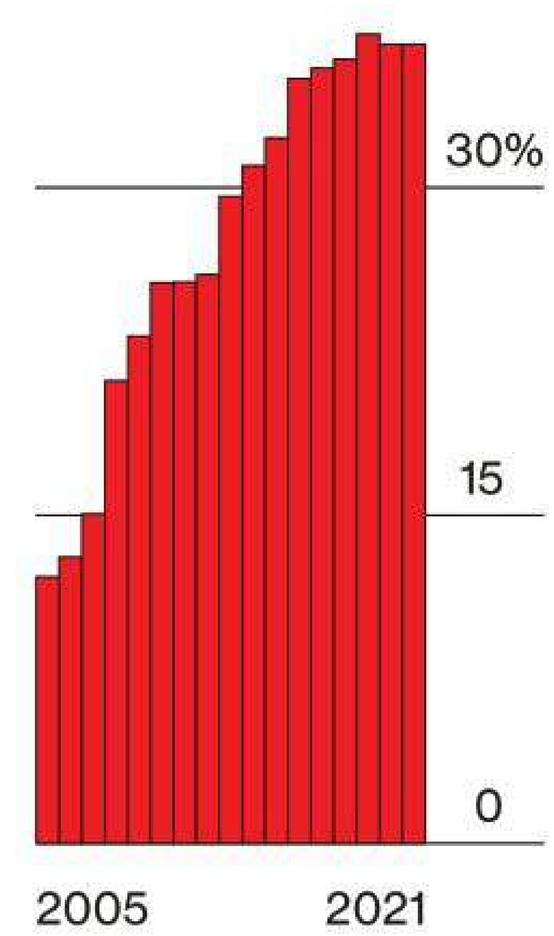
Foxconn didn't say how widely Covid had spread into the compound, where workers often share cramped living quarters. But on Oct. 19, it closed its worker cafeterias on orders from local authorities, according to one person who was there, who asked not to be identified because of the matter's sensitivity. Foxconn didn't have the staff to prepare and deliver food boxes multiple times a day, so meals were mostly given out as workers left the factory. The cooked food often ran out, leaving many with only bread and boxed milk. Those who didn't go into the factory—because they were sick or quarantined in their rooms—at times didn't get anything, according to people who were at the complex then. The quality of the food was poor, consisting of rice, shredded potato and fried bean sprouts. Xiao says the boxes he got smelled, and the dishes were commonly covered with a gooey substance.

Zeng Guang, a 21-year-old who polished metal cases at the factory, says he got stuck in his dorm room without food for a day after being categorized as a close contact with someone who had Covid. That night he grew so hungry he went down to his building's entrance to demand that the guards give him food. "They were so afraid," he says, "as if I was wielding a knife."

The daily Covid testing also proved to be flawed. As many as 20 workers' throat swabs were put into one tube to speed testing and lower costs. If the results came back positive, all the workers whose samples were in that one tube were put into isolation for further testing. Those who worked on the same production line with someone who tested positive were immediately removed and put into quarantine. The number of Covid-free workers dwindled rapidly.

The breaking point for many workers came ▶

▼ China's share of the semiconductor device market, by revenue



◀ on Oct. 28, when Foxconn announced strict measures. The move left it struggling to hold on to employees, so it raised hourly pay by as much as 36%, to about 38 yuan ($5.20) an hour for key positions. Zhengzhou's policies undercut the company's efforts: On Nov. 2 the local government ordered a seven-day lockdown of the area around Foxconn's main plant.

One night, Xiao quickly packed his belongings and hopped into a small Volkswagen sedan with two co-workers. Back in his hometown, he got increasingly frantic calls from local government officials, offering special bonuses if he would return to iPhone City. He "bowed to life" and headed back to the plant in late November.

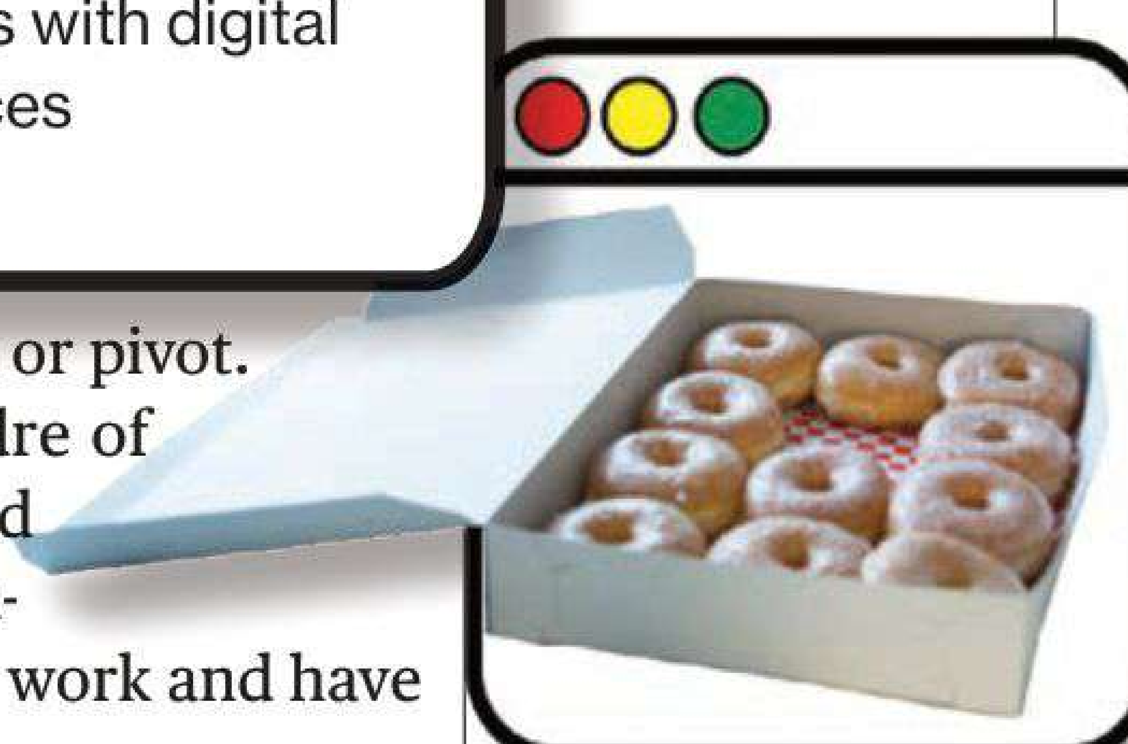
Xiao says he and others were stunned to soon find out Foxconn wouldn't hand over a promised 30 yuan in hourly pay unless they kept at their jobs until mid-March. Foxconn told workers it was in keeping with the contract, but many felt betrayed. Protests started late on Nov. 22, and violence erupted after midnight when angry laborers took to the street. Some surrounded a police vehicle and clashed with security personnel in white protective suits. Workers stormed into meeting rooms to plead with Foxconn managers not to mix them with colleagues who had tested positive. "You're sending us to death," one worker shouted at a beleaguered boss. Foxconn has once again been increasing recruitment to replace exiting staff, much as it had when thousands first fled its campus, but that overall effort is in jeopardy as Covid cases soar.

Following the riot, Xiao started packing up again. He says he'll stay in Zhengzhou to look for a job somewhere else. "Foxconn is not the only place that's hiring," he says. —*Peter Elstrom, Gao Yuan and Betty Hou*

THE BOTTOM LINE Chinese workers and citizens are rebelling against restrictive Covid policies, bringing further disruptions to a manufacturing system that is key to the world economy.

Moving Beyond the Online Meeting

● Companies are trying to reconnect hybrid workforces with digital office spaces



In presentations over two days in early November at the San Jose Convention Center, leaders from Zoom Video Communications Inc. unveiled a plan to transition from an online-meeting tool into an all-day business platform. Zoom Spots, coming in early 2023, will be a virtual-office watercooler of sorts, helping to re-create those casual conversations and quick pop-ins that fell victim to remote work.

"People, especially the ones who are working from home, they don't feel they're part of the group," Oded Gal, chief product officer, told Zoom investors. "We're missing all of these conversations that used to happen where you could talk about your personal life. And a lot of actual business decisions are made in the corridors."

Call it the metaverse (if you must), but for the office. Earlier digital-office ventures resembled video games or focused on hosting one-off online events; some have had to retrench or pivot. The latest crop—created by a cadre of startups including Roam, Kosy and Teemyco for thousands of organizations worldwide—are for everyday work and have a more professional look and feel.

What they don't have is Zoom's entrenched position, with the technology being used by almost 210,000 large employers in its most recent quarter, up 14% from the same period last year. Zoom is counting on expanded offerings, including email and calendar tools, to make up for its recent decline in consumer and small-business customers. This year it began developing Spots. The aim, says group product manager Michael Lam, isn't "just to replicate spontaneous encounters but to elevate employee engagement."

Virtual-office startups say they're already doing this. Typically, employees log in and fire up a digital representation of their office, complete with conference rooms, kitchens and spaces to socialize. Different teams—engineering, design, sales—can

▼ Share of US employees who report being engaged at work

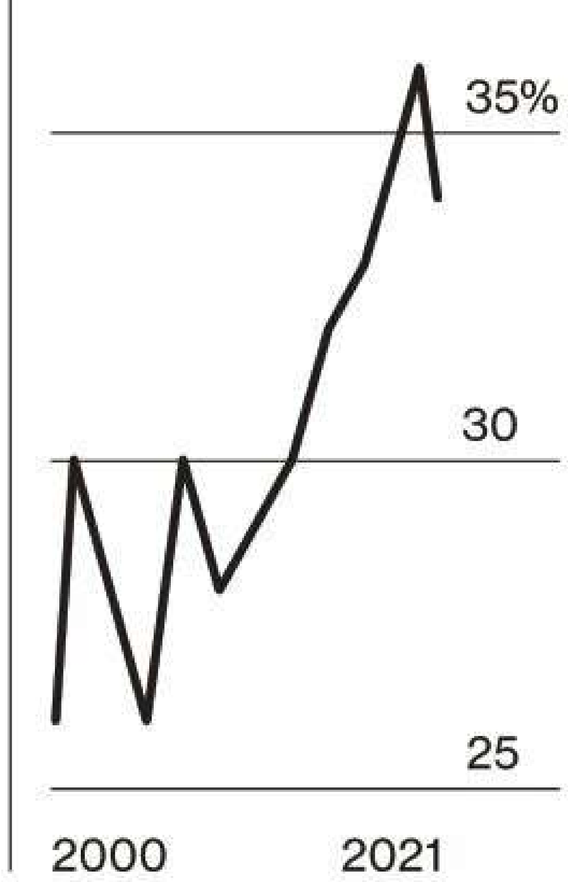
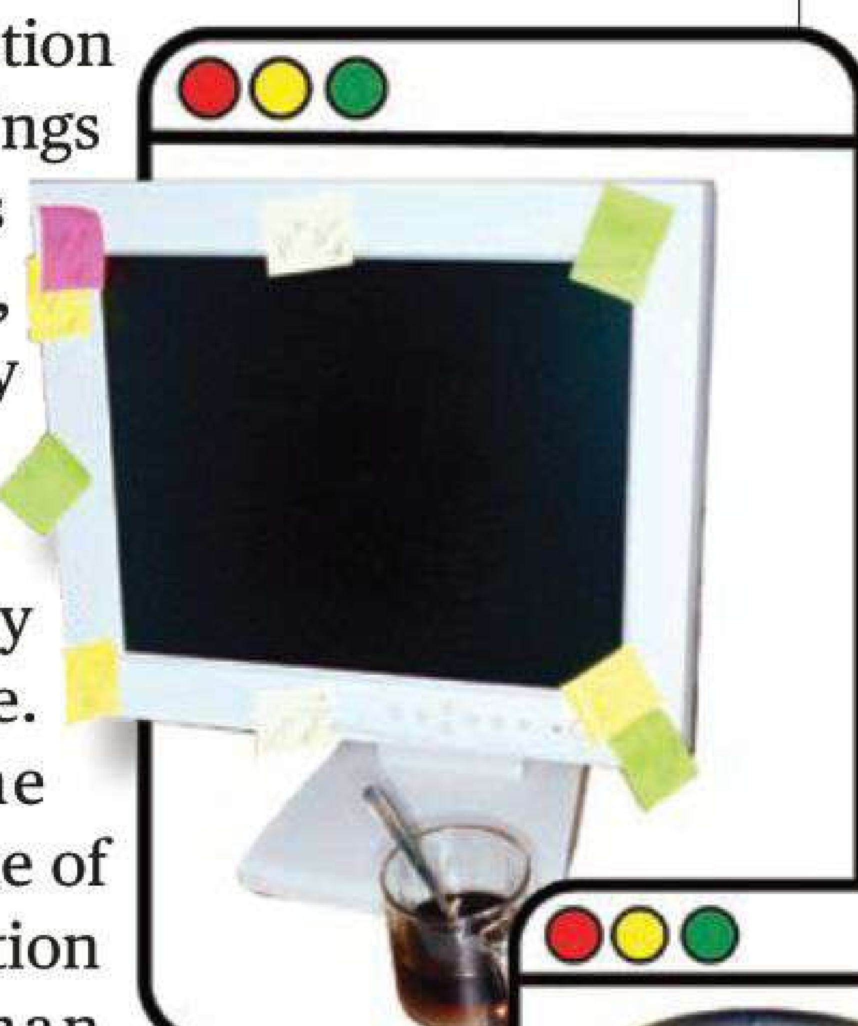


PHOTO ILLUSTRATIONS BY 731; PHOTOS: GETTY IMAGES (7). DATA: GALLUP

create their own areas. You "knock" on someone's icon, and color-coded symbols signify if someone is free to talk, on a call or not to be disturbed. Users can add personal touches such as an office dog. The cost: about $10 per employee per month, which is about half of what Zoom charges for one of its plans at a business that employs 10 to 99 people.

Zoom and the startups plan to address a pain point of today's hybrid work environment. The white-collar shift to remote work during the pandemic didn't affect productivity as much as bosses feared, but it did rupture the connective tissue between co-workers, contributing to the first decline in employee engagement in a decade, according to Gallup.

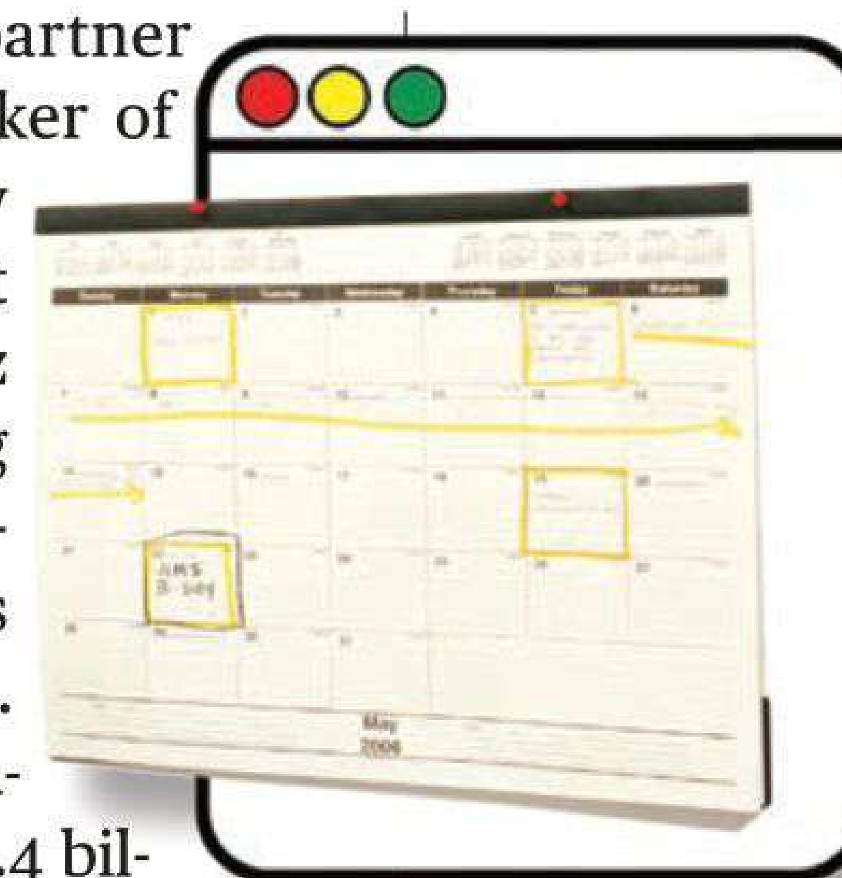


That lack of connection is one of the few things workers and bosses actually agree upon, according to a survey from the Workforce Institute at UKG and HR advisory company Workplace Intelligence. Research from the Massachusetts Institute of Technology's Connection Science and Human Dynamics labs shows that the most effective teams engage in frequent, informal communication outside of scheduled meetings.

"The post-pandemic workforce will be hybrid moving forward, and there's a stronger desire to create sustained connection and team unity," says Adam Preset, an analyst at Gartner Inc. "The thing that makes a virtual office special is the interaction between people."

That's true for Greg Kwiat, one of three brothers running their family-owned diamond business in New York. Kwiat says he's struggled to keep the 50 people in the company, including a web development team in India, engaged with one another when some work remotely. They used Zoom, but "there's no spontaneity," Kwiat says, and he couldn't tell where anyone was. About a year ago he started using Roam and says it's boosted productivity and connectedness. "This is how you can get your company connected again," Kwiat says.

Virtual-office providers are also winning over investors such as Jules Maltz, a partner at venture capital firm IVP, a backer of Slack Technologies, now owned by Salesforce Inc. IVP led Roam's recent $30 million funding round, and Maltz says any company that wants to bring employees closer together is a target customer. Kosy Software Ltd. is backed by Germany's Picus Capital. The market for collaboration applications will grow 20% this year, to $36.4 billion, according to IT industry tracker IDC, and could almost double in size by 2026.



"The market opportunity is so big it will attract a lot of people trying to figure it out," says Maltz, who expects the large workplace software vendors to get involved. Microsoft Corp.'s Teams platform, with more than 270 million active users, recently rolled out a bunch of games to "connect with your co-workers through play."

Roam founder and chief executive officer Howard Lerman says he isn't worried. "Companies want something different," he says. "They want technology to support the way humans work, not the reverse."

The virtual-office architects mainly serve small businesses, a market where Zoom is more vulnerable. There are kinks to work out before the upstarts can target bigger organizations. "Unless there are reasons for people visiting them, virtual-office spaces often go unused, just like the physical office," says Pilar Orti, head of Virtual Not Distant, which helps teams collaborate online. There's also the dark side of a hyperconnected workplace: the fear that Big Brother is watching. Roam and its ilk "might re-create the old challenge of presenteeism, or just appearing to be around for the sake of being visible to leaders," Gartner's Preset says. "For those who were glad to be out of the office, this can bring the same problem back."

What isn't coming back, at least for virtual-office users such as Kwiat, is a workday dominated by half-hour meetings. "There's nobody who prefers Zoom to Roam," he says. "Some prefer the phone, though."
—*Matthew Boyle*

THE BOTTOM LINE Startups searching for the next stage in the videoconferencing boom are building offices in the metaverse to encourage casual interactions among remote workers.

How to Give Away Your Empire and Keep Control

● Billionaires use 501(c)(4)s to avoid taxes, keep control of a business and influence politics

Ray Dalio, founder of the world's largest hedge fund, has one. The Koch family, sitting atop a $137 billion fortune, has at least two. Patagonia founder Yvon Chouinard famously created one earlier this year.

What is it? A tax code structure called the 501(c)(4). For decades it was the chosen vehicle for civic-minded charities such as Rotary International and affinity groups like the AARP. Now it's attracting billionaires who realize it offers far more: control over their business. Control over political influence. Over disclosure. Over taxes. And, of course, control over the soft power of charitable giving. All in one place.

The structure drew widespread attention in September when Chouinard donated Patagonia Inc. to a new $3 billion environmental nonprofit that will exert influence long past his lifetime. Dalio's 501(c)(4), with $3.5 billion, hasn't been previously reported, nor has a $265 million entity controlled by the Koch family. Meanwhile, Chase Koch, Charles Koch's 45-year-old son, deployed the strategy to build a $1.3 billion philanthropic war chest of his own.

The key advantage of C4s, as they're called,

Edited by Paula Dwyer and Brian Chappatta

ILLUSTRATION BY ALLIE SULLBERG. DATA: COMPILED BY BLOOMBERG is their ability to tap the illiquid wealth of entrepreneurs and owners of private family businesses without having to step away. Proponents argue they could help break a philanthropic logjam. More than 100 US billionaires, worth a collective $1 trillion, have signed the Giving Pledge since 2010, promising to donate at least half their wealth to charity. Yet only a few have gifted enough to shrink their fortunes, frequently balking at the rules and disclosure requirements that come with traditional forms of charity.

C4 critics include Senator Sheldon Whitehouse, a Rhode Island Democrat who calls them an "increasingly powerful tool for mischief by the megarich." Much of the backlash stems from giving billionaires a tax-advantaged way to exert secret influence over elected officials at the highest levels. C4s can spend unlimited amounts on lobbying and large sums on election campaigns.

Tax advisers say billionaires are just starting to tap the strategy, which circumvents many of the rules that have governed giving for more than 50 years. "It's definitely something I'm talking more about," Frank Smith, the national nonprofit tax leader at accounting firm Marcum LLP, says of C4s. "They have a lot of flexibility in what they can do."

Chouinard was initially lauded when, at 84, he gave 98% of Patagonia to a new C4, Holdfast Collective, because the transfer isn't eligible for a charitable deduction on income taxes. But for many billionaires that's not really a factor, since their taxable incomes are minuscule relative to the size of their wealth. Though eager for more resources to fight climate change, Chouinard at the time said he worried that selling Patagonia would bring in new owners who might cut staff and deviate from its environmental mission. Instead, his C4 will hold the business stake indefinitely, while 2% of shares—and all the voting stock—will be in the hands of a family-controlled trust that he said was "created to protect the company's values."

"This is a remarkably clever structure," says Joan Bozek, director of trust services at Clarfeld Citizens Private Wealth. The company will continue to be managed for profit, yet instead of all the benefits going to wealthy shareholders, they'll go back to the Earth. "The family stays in the driver's seat," she says. Patagonia has estimated $100 million will flow into Holdfast annually.

Dalio, 73, who stepped down as co-chief investment officer at Bridgewater Associates in October, created a C4 in 2018 whose contents were later transferred to the Dalio Family Fund. With $3.5 billion, it has more than twice the assets as a 501(c)(3) foundation he started almost 20 years ago. Also in 2018, filings show the Koch family set up two C4s. One, called Zero Zero One Inc., had assets of $264.5 million in 2020, its most recently available filing. Chase Koch's C4, called CCKC4 Inc. after his initials, was launched with less than $40 million but in 2020 received assets totaling more than $1.2 billion. Dalio and Koch spokespeople declined to specify which assets are held in their C4s.

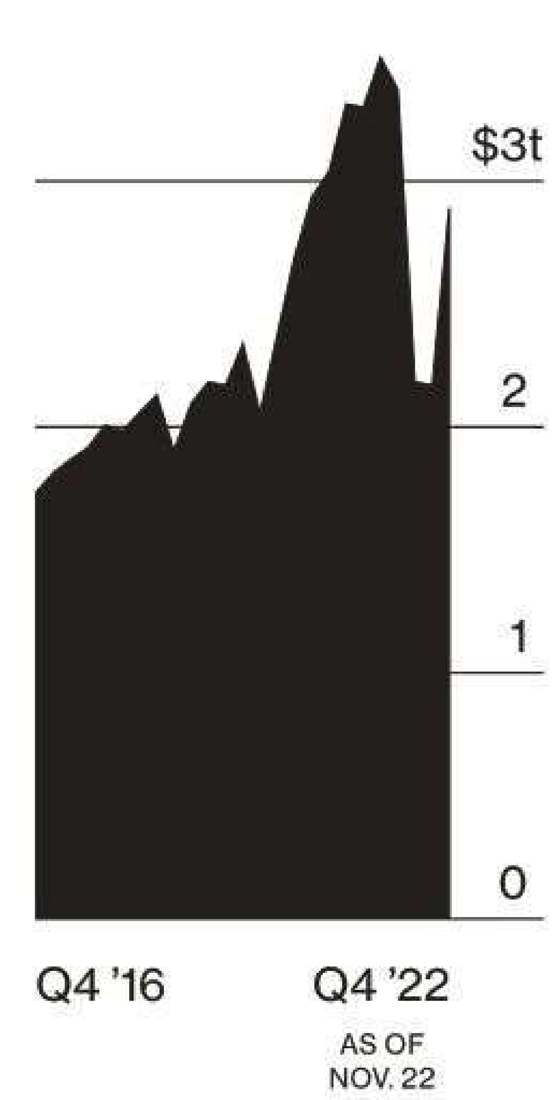
The C4 in its current form dates back to an obscure 2015 tweak to the tax code. It made clear that transfers of assets into the structure weren't subject to the 40% US gift tax. Since that levy is one of the only ways for the government to take a massive bite out of billionaire fortunes, dodging it is something of a prerequisite for dynastic wealth planning. So C4s provide something far more valuable than an annual charitable deduction: Putting a $1 billion investment in a C4 rather than selling it can save $200 million in capital gains taxes and, if structured properly, $400 million or more in estate taxes when the donor dies.

C4s are an "increasingly powerful tool for mischief by the megarich"

C4s also can opt out of many of the transparency requirements imposed on family foundations. And they have unique advantages for owners of illiquid private companies because "excess business holding" rules don't apply to them. Ordinarily, foundations aren't allowed to own more than 20% of any one company. This creates an appealing offramp for entrepreneurs loath to disengage from their life's work. "Lots of founders see their company as their baby," says Rosemary Fei, a principal at the law firm Adler & Colvin.

While Dalio handed day-to-day control to the next generation and has reduced the size of his Bridgewater holding, he made clear he wasn't exiting his stake in the firm, which makes up almost half his $16 billion net worth, according to the Bloomberg Billionaires Index. "Hopefully until I die, I will continue to be a mentor, an investor, and board member at Bridgewater," he said on Twitter.

▼ Net worth of the 150 richest Americans



Despite looser rules, C4s are still subject to basic guardrails. Donors can't take the money back. And direct spending on elections can't be a C4's primary purpose, a rule many lawyers interpret to mean it can devote up to 49% of its spending to finance campaigns.

Chouinard has made clear that influencing environmental policy is a Holdfast Collective goal. Other donors may choose C4s for the same reason, says Karen Kardos, head of philanthropic advisory at Citi Private Bank. "Many philanthropists recognize that in order to make systemic change to truly drive impact, they must be able to move the legislative needle," she says. By contrast, Dalio's ▶

◀ "philanthropic entities do not make political donations," a spokesperson says. His family's giving—more than $1.3 billion so far, according to Dalio Philanthropies—has focused on causes such as ocean exploration, child welfare in China and improving education.

The Kochs' giving strategy has shifted in recent years. In a 2020 book, Charles Koch said he regretted spending heavily to help Republicans, arguing that partisan politics won't solve long-term problems. The Kochs' new C4s don't show an overtly political bent. In filings through the end of 2020, their gifts went to C3 nonprofits, including donor-advised funds and the Charles Koch Foundation, which can't give to campaigns. Last year, Chase Koch's C4 gave $85 million to a family-funded group with the condition that it not "support or engage in any political activity" with the grant.

Hanging over the C4 is the threat that Congress could limit its tax benefits. Unless and until that happens, more wealthy families may soon adopt a tool pioneered by a few of the world's richest people. "There isn't one vehicle that has everything, and from a public policy perspective, there shouldn't be," says Fei, the nonprofit lawyer. "But for donors, that's the Holy Grail." *—Ben Steverman, with Noah Buhayar*

THE BOTTOM LINE Billionaires can have their cake and eat it too, with the old-fashioned 501(c)(4)'s newfound use as an estate planning tool.

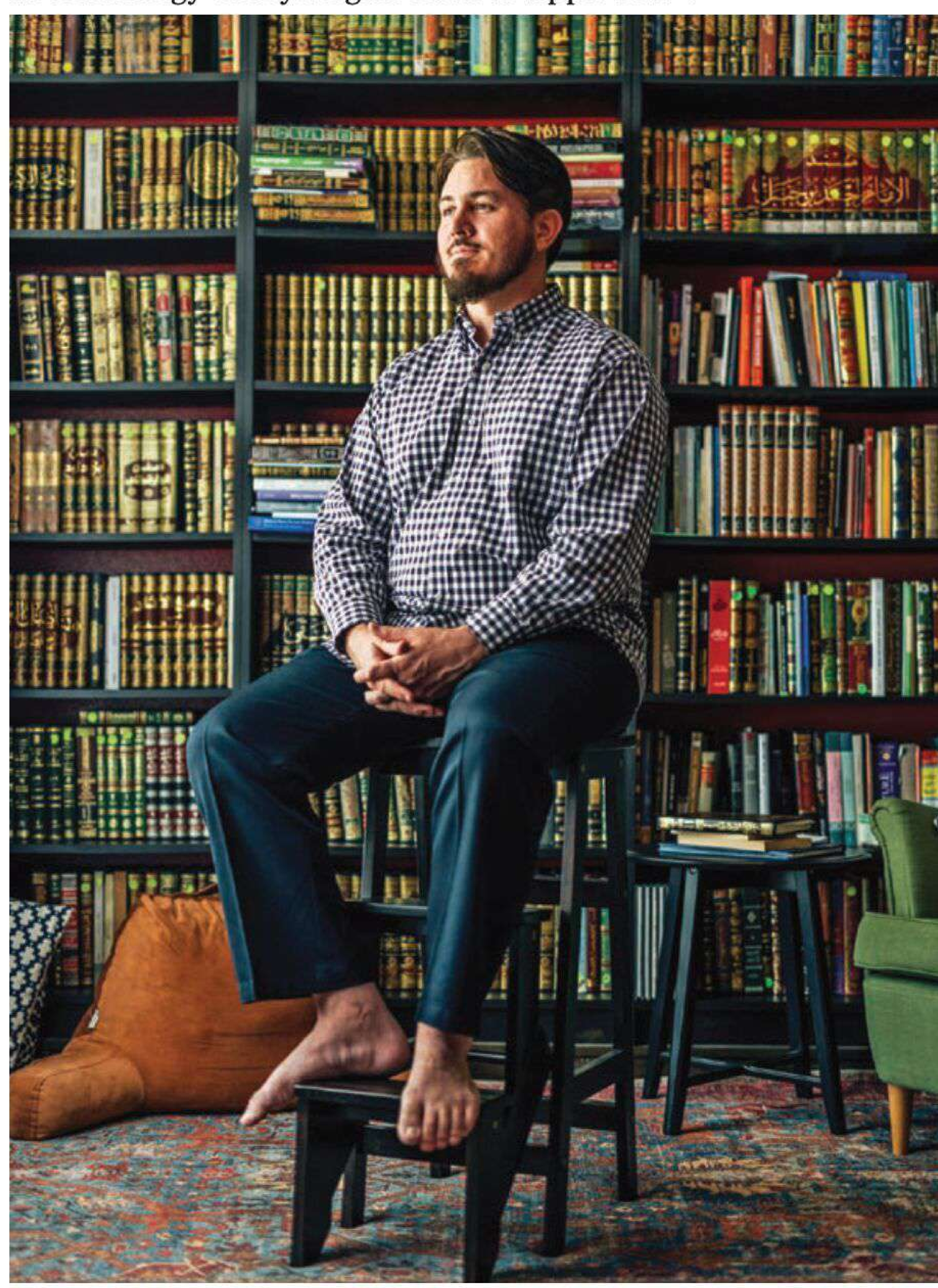
Halal Investing Is Complicated. There's an App For That

● New fintech companies and social media are helping match portfolios with beliefs

In a crowded field of social media influencers who dispense financial advice, Sheikh Joe Bradford has found his niche. An expert in Islamic law, Bradford teaches his audience how to invest their money the halal way.

The comment sections of his accounts—where 85,000 followers across Facebook, Instagram and Twitter convene—are full of questions about exactly which investments are allowed for Muslims and which are forbidden, or haram. The queries reveal the challenges facing a generation of financially and technologically literate Muslims who want to know how traditional Islamic guidelines apply to everything from stocks to nonfungible tokens.

Some of the rules under Islamic law, or sharia, are straightforward: Observant Muslims are not allowed to profit from interest, sales of pork, or so-called sin stocks linked to gambling, alcohol and pornography. That generally makes shares in technology heavyweights such as Apple Inc.



▲ Bradford

and Tesla Inc. permissible but excludes financial companies such as JPMorgan Chase & Co. Berkshire Hathaway Inc. is forbidden because of its large holdings in property and casualty insurers, which receive substantial interest income from bond investments.

But things quickly get more complicated. Netflix Inc., with original content such as the reality show *Too Hot to Handle*, where participants

BRADFORD: PHOTOGRAPH BY ARTURO OLMOS FOR BLOOMBERG BUSINESSWEEK. MALIK: PHOTOGRAPH BY ELIANEL CLINTON FOR BLOOMBERG BUSINESSWEEK. DATA: ZOYA FINANCE, SATURNA CAPITAL

▲ Malik

lose money if they hook up with their fellow contestants, is a toss-up, since it may promote promiscuity. Even the status of grocery giant Walmart Inc. is questionable because it sells alcohol, pork and tobacco. Companies are also disqualified if they have debt that's more than 33% of their market value—a ratio that's constantly moving for some businesses. About half of the companies in the Russell 2000 wouldn't pass the debt-to-market-cap test, according to Bloomberg data.

The Islamic finance industry globally is well-established and is estimated to be worth about $3.6 trillion. Of that, about $630 billion is sukuk, or Islamic bonds. Rather than lend money to a conventional borrower in exchange for interest, sukuk holders own a share of the asset that backs the debt and receive income from any profit it generates.

Halal investing is still relatively new to the US, where Muslims make up about 1% of the population. Older generations of Muslims often stuck to home purchases and physical gold for investments or picked a few stocks that were recommended by friends. The complexities have made Islamic finance something of an afterthought for many. But that's starting to change as technology evolves and demographics shift. "You have kind of a twofold development," says Bradford, who's been working in investment education since 2015. Some high-earning Muslims have become more religious as they've gotten older and want to alter their portfolios. Then there's "a full new generation of people whose parents maybe were not as wealthy," says Bradford, but now have money to invest for the first time.

Tasmia Mustaquim is a health-care consultant in Centreville, Virginia. She became interested in investing in college when, during an internship, a manager explained the importance of a retirement plan. "That planted a seed for me," she says. But Mustaquim knew there was a rule forbidding interest and looked online for clues on how to avoid it when investing. "I've spoken to family members about investing, but they weren't very knowledgeable," she says.

Along with financial educators such as Bradford, fintech startups, halal stockpickers and special exchange-traded funds are filling the gap. Saturna Capital Corp. offers sharia-compliant mutual funds under its Amana brand. Zero-fee brokerages have also made finance more accessible to Muslims. These low-cost platforms make serving clients who "have otherwise been overlooked or unprofitable" more viable, according to Aamir Rehman, co-founder of the Dubai-based private equity firm Fajr Capital and former head of strategy for HSBC Amanah, the Islamic finance arm of HSBC Holdings Plc.

Those who want to actively trade equities can use stock screeners such as Zoya Finance, which launched in 2020 and will soon add a trading platform. Its app lets users know which companies are halal—or at least as halal as possible—or aren't, and why. Zoya's frequently asked questions section includes an admonition that "these are meant to be guidelines" and adds, "as always, Allah knows best!"

Saad Malik, a former JPMorgan executive who co-founded Zoya with an ex-Amazon Web Services engineer, grew up with the perception that investing is like gambling, which isn't permitted in Islam. "When there's no knowledge, there's fear," Malik says. It's easy to see how that fear arises given the confusion around some newer financial instruments. Last year, the religious council of Indonesia, the most populous Muslim country, ruled that owning crypto, which has elements of wagering, is forbidden for Muslims. Neighboring Malaysia's council has labeled the digital asset as permissible.

Options for observant Muslims are particularly limited when it comes to retirement savings. Few 401(k) accounts are compliant with Islamic law, because they often contain interest-paying bonds or forbidden stocks. Only about half of employers offer self-directed brokerage accounts that would allow Muslims to select halal investments, according to benefit services provider Alight Inc.

In the nine years that Khwaja Siddiqui has been working as a doctor, none of his employers has offered a halal 401(k) option. To maintain what he calls his "financial morality," Siddiqui has avoided contributing to the plan entirely and instead invests his retirement funds in a Roth IRA, which his employer doesn't match. If there are no good choices, Muslims are often advised to pick the most halal route and purify their gains by giving away the percentage that's invested in noncompliant holdings. —*Dayana Mustak*

THE BOTTOM LINE Not everyone agrees on which investments are halal, but profiting from alcohol, tobacco, gambling, pork and interest are definitely off the table.

▼ Halal compliance status of selected stocks, by adviser

● Compliant
● Questionable
● Noncompliant

	Zoya	Saturna
AbbVie	Compliant	Compliant
Apple	Compliant	Compliant
Chevron	Compliant	Compliant
Eli Lilly	Compliant	Compliant
Exxon Mobil	Compliant	Compliant
Home Depot	Compliant	Compliant
Johnson & Johnson	Compliant	Compliant
Mastercard	Compliant	Compliant
Nvidia	Compliant	Compliant
Pfizer	Compliant	Compliant
Procter & Gamble	Compliant	Compliant
Tesla	Compliant	Compliant
Visa	Compliant	Compliant
Alphabet	Questionable	Compliant
Microsoft	Questionable	Compliant
Amazon	Questionable	Noncompliant
UnitedHealth	Noncompliant	Compliant
Bank of America	Noncompliant	Noncompliant
Berkshire Hathaway	Noncompliant	Noncompliant
JPMorgan Chase	Noncompliant	Noncompliant

Caring Men

● More men are quitting work to look after children or parents

For Ryan Burdick, the incessant questions about when he plans to go back to work have gotten old. So has the "Mr. Mom" label.

Still, the 38-year-old father of two says he has no regrets about his decision 10 years ago to step away from his burgeoning career as a commercial pilot to stay at home, where he now cares for his sons Walter, 10, and George, 7, full time. "My joke forever has been, 'I'm retired,' when people ask me what I do," says Burdick, whose wife, Stephanie, 36, is a physician at a hospital in Grand Rapids, Michigan.

Burdick's wife was working as a resident when the couple realized that the nanny they'd just hired couldn't cope with the demands of their on-call jobs. After reviewing other child-care options, the couple decided it would make more sense for Ryan to assume care and household responsibilities. The setup has enabled Stephanie to advance much faster in her profession, which has eased the financial strain of living on one income. "My career potential is much higher because he stays home," she says.

The slow slide in the labor force participation rate of American men in their prime working years—defined by the Bureau of Labor Statistics as age 25 to 54—has perplexed economists and policymakers, who've attributed the decline to a number of factors including shrinking payrolls in manufacturing and other traditionally male-dominated sectors, along with lagging educational attainment by men.

Some 88.5% of prime-age men were either working or looking for work in October. That's down more than 9 percentage points from around the time the BLS began tracking the data in the 1950s. The phenomenon has been extensively chronicled in books with such fatalistic titles as *The End of Men* and *The Boy Crisis*.

Men dropping out of the workforce to assume caregiving responsibilities have played a comparatively small role in the overall trend, but the numbers have been climbing and, by at least one measure, may have hit a record last year.

Often-cited government data may be underestimating the size of the cohort: The census defines the category narrowly as husbands in opposite-sex marriages with children under 15 who specifically say they're not working so they can care for family and whose wives are either working or looking for work. Under those terms, men accounted for 5% of the one-fifth of US families with a stay-at-home parent this year, up from about 1% in the mid-'90s and representing 239,000 fathers.

● Burdick at home with sons Walter and George

BURDICK: PHOTOGRAPH BY SARAH RICE FOR BLOOMBERG BUSINESSWEEK. MATTHEWS: PHOTOGRAPH BY SEPTEMBER DAWN BOTTOMS FOR BLOOMBERG BUSINESSWEEK

Edited by Cristina Lindblad

According to a broader analysis by the Pew Research Center—which expands the pool to include any father of a child under 18 who hasn't been working, regardless of reason or marital status, and also incorporates men in same-sex relationships—the number of stay-at-home dads had swelled to about 2.1 million by 2021, equal to 18% of all stay-at-home parents, up from 10% in 1989.

In the Pew study, 23% said the reason they'd exited the labor force was to care for children, as opposed to job loss (13%), disability (34%) or being in school or retired (20%). That's up from just 4% who cited caregiving in 1989, according to Pew.

Arielle Kuperberg, an associate professor of sociology and gender studies at the University of North Carolina at Greensboro who's conducted her own review of federal statistics, found a record 15.2% of fathers of children under 18 were not working last year, up from 14% in 2019 and less than 8% in 1980. Many men may be "functionally stay-at-home parents, even though that's not the reason they would give on a survey," she says, because of lingering societal stigma.

Cultural norms on masculinity, work and family have been slow to evolve, according to Richard Reeves, the author of the new book *Of Boys and Men: Why the Modern Male Is Struggling, Why It Matters, and What to Do About It*. "We've recast motherhood and what it means to be a mom in such a way that moms can be breadwinners, too, now," says Reeves. "But we haven't recast fatherhood in such a way as to make it easier for men, both culturally and practically and economically, to become more hands-on fathers."

Burdick concurs. "The world isn't really built for stay-at-home dads," he says, noting, among other impediments, the lack of diaper-changing stations in men's bathrooms. School administrators routinely call his wife with questions and in emergencies, even though he's listed as the primary contact.

One important driver of change in gender roles has been the divergence in the evolution of earnings dynamics for men and women. Almost a third of women who were married or cohabiting were contributing at least half of the couple's total earnings in 2017, up from 25% in 2000 and just 13% in 1980, according to a Pew report.

"All those years of higher-education enrollments going up for women have now started to bear fruit," says Jennifer Glass, a sociology professor at the University of Texas at Austin who published a report last year on the increase in female breadwinners. "They have jobs that are more stable, that provide health insurance, that are unlikely to go away during a recession."

She notes that, historically, women who were the main source of household income were mainly unmarried, divorced or widowed. In more recent decades, the increase in breadwinning mothers has been among partnered women. Their in-demand skills in fields such as health care and education have boosted their earning power, which contrasts with the "slide in inflation-adjusted earnings" among their male counterparts, a trend attributable in part to downsizing amid increased corporate mergers and the growth of contract work.

▲ Mario Matthews with his mother

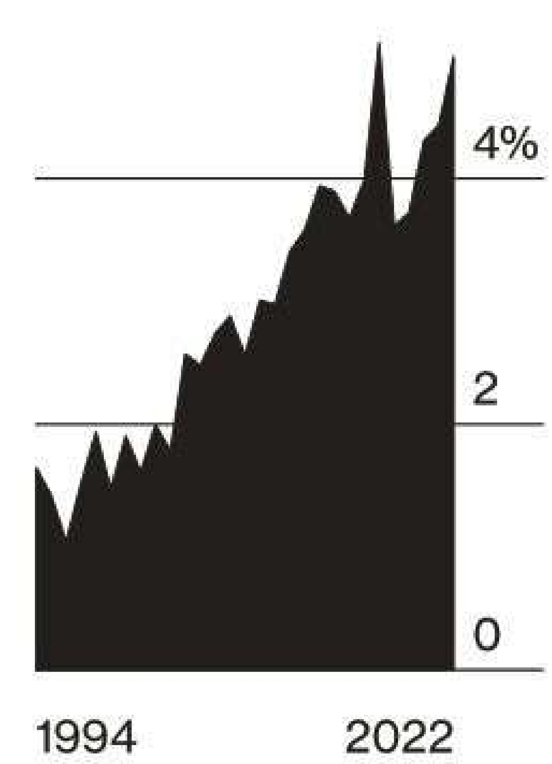
This disparity in earning potential is what helped push Jason Mitchell to take on the role of full-time parent in 2014. At the time, Mitchell was an adjunct professor of English composition at Appalachian State University in Boone, North Carolina, while his wife had a Ph.D. and a better-paid tenure-track position at the university's business school.

The couple juggled their teaching schedules as best they could after the birth of their first child. That no longer worked with the arrival of baby No. 2. "We were sort of like two ships passing in the night," recalls Mitchell, 40, who now cares for a brood of four, age 4 to 11. "Honestly, my English job was not going to be sufficient to cover child-care costs for more than one kid."

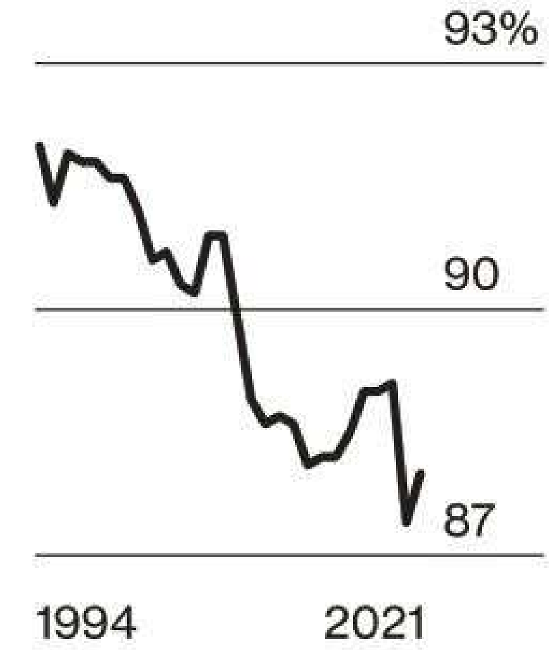
The pandemic drove up America's already high child-care costs by causing many day-care centers to close while also triggering an exodus of staff into higher-paying jobs. In a recent survey, 58% of families said they would spend upward of $10,000 on child care this year, compared with the 45% who said they'd spent at least that much in 2019.

Even once his youngest starts going to school full time, Mitchell says he doesn't see himself returning to work, "only because there's so much to ▶

▼ Male caregivers as a share of US families with a stay-at-home parent



▼ US labor force participation rate at yearend for men age 25-54



MALE CAREGIVER FIGURE COVERS OPPOSITE-SEX MARRIED COUPLES WITH CHILDREN UNDER 15 WHERE ONE PARENT IS IN THE LABOR FORCE FOR ALL OF THE PREVIOUS YEAR AND THE SPOUSE IS OUT OF THE LABOR FORCE FOR THE ENTIRE YEAR, WITH THE REASON BEING "TAKING CARE OF HOME AND FAMILY." LABOR FORCE PARTICIPATION RATE IS THE SHARE OF THE GIVEN POPULATION WORKING OR ACTIVELY LOOKING FOR WORK. DATA: US CENSUS BUREAU, US BUREAU OF LABOR STATISTICS

◀ do" managing the home and coordinating the schedules of four children. Still, he considers himself lucky. "I thought I would miss teaching," he says. "But it sort of pales in comparison to being able to watch the children grow and spend as much time with them as I get to."

Of course, most American families don't have the luxury of living on a single income. Kristopher Park, 34, resigned last year from his job with the state of Delaware as an intake processor for food benefits and other government-assistance programs upon realizing, after comparing options, that his roughly $1,000 biweekly paychecks wouldn't cover the $2,500 monthly cost of day care for his sons, now 5 and 2.

It made more sense for his wife, Nicole, 32, to accept a $50,000-a-year job as an accountant with the Wilmington Housing Authority and to care for the kids (their third, a daughter, was born in October) than to route all of his earnings to a nanny or day care, he says.

Although he's committed to full-time caregiving for the time being, Park uses his spare hours to develop his skills in computer programming and 3D modeling, hoping it will open doors to better-paying jobs that would make working outside the home worthwhile. "The reality is, with her income alone, we have basically no buffer in the event of an emergency," he says.

The rise in child-care expenses mirrors an increase in elder-care costs. Out-of-pocket expenses for elders increased 41% from 2009 to 2019. The number of elder-care workers, like the number of child-care providers, remains stubbornly below its pre-pandemic level.

The dearth of affordable options is what motivated Mario Matthews to move in 2020 from Los Angeles to his native Oklahoma City to care for his 60-year-old mother, Kathy Grant, who'd been diagnosed two years before with early onset dementia.

"Some days she remembers her name, other days she doesn't," says Matthews, 42, who left his job as a server at celebrity hotspots such as Beauty & Essex and Soho House after Grant's waning independence and depleted savings effectively pushed her out of the $5,000-a-month assisted-living facility where she'd been residing.

Grant can no longer eat or get dressed without assistance. She speaks in patterns, rather than sentences, says Matthews, and is now gripped by a fear of falling down, even when moving about her home. "I have seen it in her eyes," he says of her anxiety, noting that she now requires sedation for routine checkups at the dentist and eye doctor.

Men accounted for almost 39% of family-care providers in 2020, up from 27% in 1997, according to AARP and the National Alliance for Caregiving. "We see more men are self-identifying as caregivers than they did before, perhaps underscoring the culture shift that is taking place around caregiving, who provides it and who is comfortable talking about it," says Fawn Cothran, a research director at the NAC.

"We see more men are self-identifying as caregivers than they did before"

Some 9% of caregivers of people with Alzheimer's or other forms of dementia gave up working entirely last year, figures from the Alzheimer's Association and the NAC show. Some 18% went from full- to part-time work or cut back hours.

Matthews considered looking for a 9-5 job after he moved to Oklahoma City but quickly determined that his wages would go entirely to cover the cost of a nurse. He says that in many ways he prefers to look after his mother himself than having to screen potential caregivers. Although Grant has lost many of her abilities, she responds positively to music and lights up when Matthews dances around or makes funny faces. "It is very fun to see her laugh," he says. —*Jordan Yadoo*

THE BOTTOM LINE Government statistics undercount the number of men taking on full-time caregiving responsibilities. By one measure, the share of fathers not working reached a record last year.

The Global Risks From Rising Rates

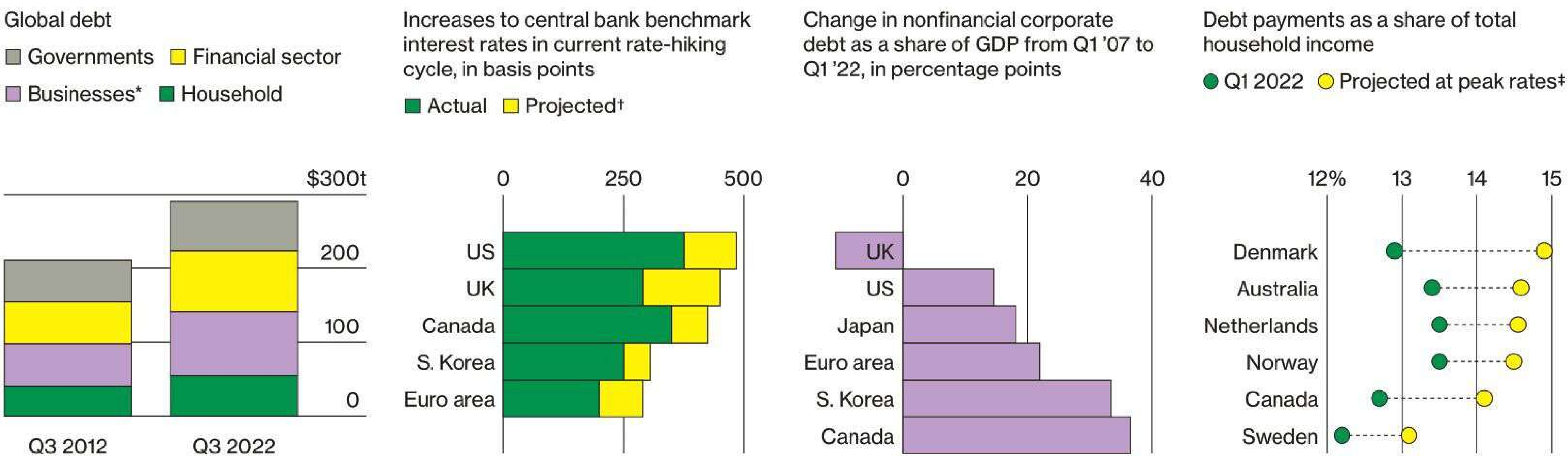
● There's a lot of debt out there. Here's a guide to what could sour

The world is emerging from the cheap-money era with a mountain of debt that's now getting painfully expensive. Around the globe, the total owed by households, businesses and governments stands at $290 trillion, up by more than one-third from a decade ago, according to research by the Institute of International Finance.

Although the world's debt has declined from a pandemic-driven record early this year, the risks it poses to economies and financial markets are intensifying. That's because many borrowers face a relentless increase in their interest payments, as the Federal Reserve and other central banks raise rates at the fastest pace in decades to subdue inflation. Many loans were locked in when rates were low, so the bills won't all come due at once. Still, at

Pain Points

A look at where the end of an era of easy money could bite the most



*NONFINANCIAL. †BASED ON MARKET MEASURES, EXCEPT FOR SOUTH KOREA, WHICH IS BASED ON ECONOMIST SURVEYS. ‡BASED ON MARKET EXPECTATIONS
DATA: INSTITUTE OF INTERNATIONAL FINANCE, BANK FOR INTERNATIONAL SETTLEMENTS, TS LOMBARD, BLOOMBERG

a minimum, there will be a squeeze on economies already struggling with a cost-of-living crisis. At worst, something in the global financial system may break. Recent history is rich in examples of large debt piles that turned bad, from Japanese corporations in the 1990s to US homebuyers and European governments in the following decades.

As higher debt payments begin to strain personal, corporate and government budgets, investors are scanning the planet for potential weak links—from the balance sheets of Canadian households to Italy's public finances to private credit markets in the US.

Rising interest costs are "a slow-moving train for consumers and companies, just like for governments," says Sean Simko, global head of fixed-income portfolio management at SEI Investments Co. "At some point you are going to be watching it slowly creep up. And then all of a sudden it's going to be in your face. And then it's going to be too late."

Rich countries can generally afford to pay more interest on their government debt for a while, though investors worry about Italy, and the UK suffered a bond-market scare a few weeks back. The danger is more acute for developing economies, especially those that borrowed in dollars. As for corporations, signs of a credit squeeze are already showing up in pockets of global finance.

Housing debt dominates consumer balance sheets, so that's where the dangers are biggest—and there's a particular mix of ingredients that identifies the places where trouble is brewing.

They're often countries that dodged a housing or banking crash in the Great Recession—so households kept adding debt—and have a large share of floating-rate mortgages, which means that higher central bank rates are rapidly transmitted to borrowers. Canada, Australia and South Korea fit one or both categories.

"Just think back to *The Big Short*," says Dario Perkins, an economist at TS Lombard in London, referring to the book and movie about a group of investors who got rich betting on the US subprime mortgage collapse. "They basically were trying to time the reset in borrowing costs. There isn't that ticking time bomb in the US anymore. But there is in other countries."

Toronto-based real estate lender Romspen Investment Corp. recently halted redemptions on its largest mortgage fund after a number of borrowers stopped making payments. Canadian households are among the most indebted in the world.

Also ranking high on that list are northern European countries. In the UK, where rates on most mortgages reset after two or three years, debt payments are on track to exceed 10% of all household income (not just for mortgage borrowers). In the Netherlands, Sweden and Norway, they're already well above that threshold—and heading toward 15% if central banks keep hiking rates as they're expected to.

Homeowners in Asian countries including South Korea, Malaysia and Thailand are also set to get squeezed, says Jonathan Cornish, head of bank ratings for the Asia-Pacific region at Fitch Ratings.

Businesses (outside the finance industry) are neck-and-neck with governments as the biggest borrowers of the cheap-money era, according to the IIF—and they don't get to print their own money as a way out of debt troubles.

This year's surge in borrowing costs may add to the ranks of businesses that only earn enough cash to service their debts—sometimes labeled "zombie companies," even though they employ lots ▶

◀ of people and produce goods and services that consumers want. By some measures, about one-fifth of publicly traded corporations already fit that definition when interest rates were low. With debt costs now surging, more companies are likely to join them. And some that were already in the zombie category may go bust.

"This looks a lot to me like the internet bubble," Scott Minerd, global chief investment officer at Guggenheim Investments, said on Bloomberg Television. Even though plenty of companies now are making money, "we have a lot of companies that aren't."

Worldwide, Moody's Analytics Inc. reckons that default rates on what it calls "speculative grade" debt—what the financial world calls "junk"—will almost double next year. In the $6.7 trillion market for high-grade US corporate bonds, there are signals that defaults could be by far the worst of the past five decades, according to Barclays Plc.

Investors are even more worried about Asia, where the dollar's strength has made dollar-denominated debt more expensive. Prices of bonds issued by real estate developers in Vietnam and Indonesia have swooned, while defaults in China's property sector are at record levels. In South Korea, the company that built the local Legoland theme park missed a debt payment in October, a rare event in that country.

For smaller businesses in the US, which tend to borrow from banks at floating rates, the worst is yet to come, says Aneta Markowska, chief financial economist at Jefferies LLC. They'll likely be forced to fire workers as the Fed's rate hikes peak early next year. "It's in the first quarter when I'd expect to see more cracks, as these small businesses start to see the pain of higher rates," she says.

Markowska sees another risk in private credit markets, where investments often involve borrowed capital. "A lot of large leveraged deals went through in recent years," she says. "And when those deals were underwritten, nobody ever expected the funds rate would get close to 5% in the lifetime of those deals."

Minutes of November's meeting of the Fed's rate-setting committee show that several policymakers also flagged "hidden leverage" in the nonbank sector as potentially disruptive to the function of large global markets.

Governments in rich economies that borrow in their own currencies generally don't face the kind of immediate constraints that households or businesses do when interest rates rise. That doesn't mean they're invulnerable, as Britain recently demonstrated. Then-Prime Minister Liz Truss's plan to cut taxes backfired, triggering a rout in government bonds as investors panicked about the extra debt it would incur. Truss is gone, and UK markets have steadied, but the new government still faces a doubling of interest costs next year.

Among developed economies, Italian public debt worries investors the most. The government's interest payments are on track to exceed 7% of gross domestic product by 2030, an unsustainable figure, Bloomberg Economics estimates. The European Central Bank has backstopped Italian debt in the past, but doing so again would likely face opposition from other European Union governments.

The US may be headed for political headaches over debt, too. With Republicans poised to take control of the House of Representatives in January, there's potential for another market-roiling fight over raising the federal debt ceiling.

Many developing countries are already in the middle of sovereign debt crises. Sri Lanka and Zambia have defaulted, while Egypt and Pakistan are among a handful of others at risk of following suit. The world's emergency lender to governments, the International Monetary Fund, estimates that more than half of low-income countries are in debt distress or on the brink of it. The fund has been pumping out rescue packages like never before. "If you think that you need a buffer, we're here for you," IMF chief Kristalina Georgieva said in October in Washington.

"This looks a lot to me like the internet bubble"

Borrowers have some resources to ward off the effects of higher debt costs. Emerging economies have boosted their foreign exchange reserves, and many households were able to save money in the pandemic, while businesses posted strong earnings during the recovery. Policymakers have learned from past crises and have tools to intervene when stresses build.

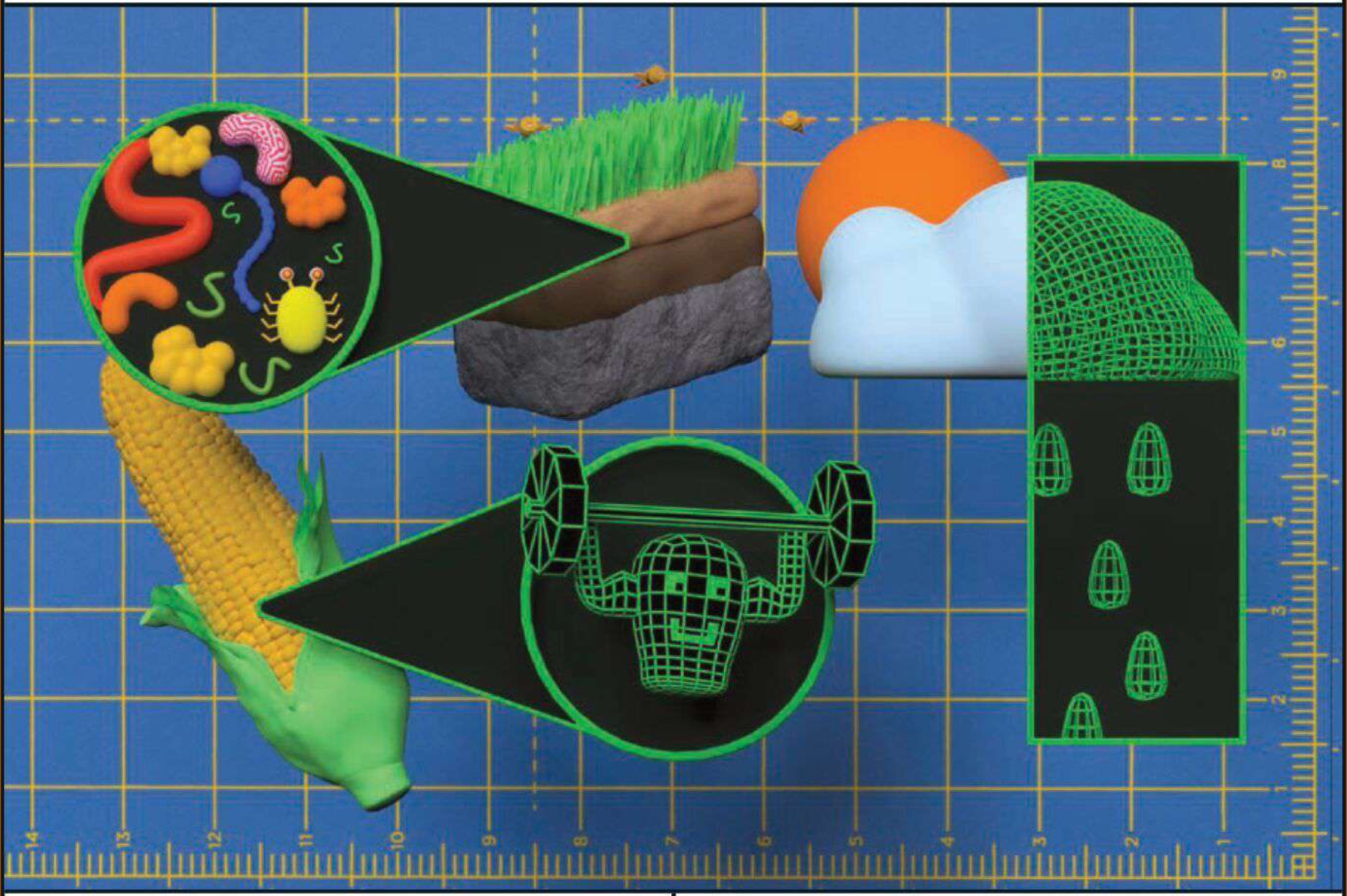
The extent of the damage is likely to depend on how high central banks push interest rates. A quickish victory over inflation, or a decision to settle for prices that are somewhat above target, would allow them to stop tightening. For now they look set to keep going, while the full impact of what they've already done has yet to hit.

"Before they get to the destination, I think it's likely that they are going to create a lot of damage to the economy and financial markets," Minerd says. —*Liz Capo McCormick, Ben Holland, Alex Tanzi and Enda Curran, with Jill R. Shah and Finbarr Flynn*

THE BOTTOM LINE Globally, debt owed by households, businesses and sovereigns stands at $290 trillion, up more than one-third from a decade ago, raising concerns about defaults.

Innovation

A Crystal Ball for Farmers



Cropin aims to help growers boost agricultural efficiency with technology

Gangavalli Naga Suresh and his ancestors have grown crops including corn, oil palm and rice in eastern India's Vijayawada region for generations, gazing at the sky to predict weather, sifting soil through their fingers to gauge moisture and jotting down yields and prices as well as dates for sowing, watering and harvesting. Four years ago, Suresh turned to technology to help him plan his 40-acre, family-owned farm. A service now gives him tailored advice for critical decisions, such as how much seed to sow and when to sow it, informed by meter readings of soil temperature and moisture content, satellite imagery of local weather patterns and artificial intelligence tools. "Technology helps me use materials and labor more precisely," says Suresh, standing in a field covered in wispy corn shoots. "My income has risen nearly 30%."

Behind the farmer's efforts to optimize his operations is Bangalore-based Cropin Technology Solutions Pvt, which is building a global cloud-based service for agriculture. The startup reaches 7 million farmers in 100 countries through its 250 customers, which include seed giant Syngenta AG, consumer goods company Unilever Plc, the governments of India and Nigeria, and agencies such as the World Bank. Cropin's annual revenue is in the tens of millions of dollars, and it has raised $33 million to date, says its co-founder and chief executive officer, Krishna Kumar. He expects the company to come close to a $500 million valuation with its next investment round, which would help Cropin in its quest to become a Wikipedia-like database for agriculture. "In a decade, we

ILLUSTRATION BY BRENDAN CONROY

want to be the crystal ball that every farmer could gaze into and foresee yield or pricing information customized to his particular farm," says Kumar.

When Cropin got going in 2010, venture funds were reluctant to hear agriculture technology pitches, and most investors focused on funding e-commerce startups that linked farmers with buyers, Kumar says. Cropin's most prominent investors, Beenext of Singapore and the Bill & Melinda Gates Foundation, came on board in 2017 and 2018, respectively. But the agtech sector is attracting more interest now. In the three months that ended in June, venture capital-backed agtech companies raised $2.5 billion in 204 deals, according to tracker PitchBook. "For over a decade, this segment has existed outside the sight of investors, but agtech's time will be in the coming decade," says Vineet Rai, managing partner at Aavishkaar Capital, which focuses on agtech investing.

Market conditions are helping agtech backers make their case, as supply chain snarls, climate change and Russia's invasion of Ukraine worsen a food crisis, amid forecasts for the human population to reach 10 billion by 2050. By employing technology, the agriculture industry could tack on $500 billion of additional value to global gross domestic product by 2030, amounting to a 7% to 9% improvement, according to research by the McKinsey Global Institute.

Kumar, a former General Electric Co. engineer whose ancestors were farmers, says he was distraught by a spate of suicides among India's debt-stricken growers and founded Cropin to help them. Back then, smartphone penetration was low, most phones were on slow 2G networks, and the bulk of the farmers and even lenders, seed retailers and fertilizer sellers operated with pen and paper. Kumar and his co-founder Kunal Prasad, a friend from middle school, wanted to tackle the poor information flow that hindered decision-making across the industry. By 2016, Cropin was collecting and processing data on 100 crops in dozens of countries, estimating for example, when rice fields in California—the biggest sushi rice-producing region in the US—would be so parched from drought that crops would be past the point of salvage.

Cropin works with Starbucks Corp. supplier Rainforest Alliance to predict disease attacks on cocoa farms in South America 15 days in advance, helping farmers avert losses; that model is now being rolled out to millions of tea, coffee and cocoa growers around the world. The company also assists Bayer AG's corn growers in Brazil and cucumber growers in the US by predicting irrigation needs, pest attacks and yield. In India, which runs the world's largest farm insurance program, covering 140 million farmers, Cropin's data is used in a central region to arrive at an accurate yield benchmark; farmers in villages below the benchmark get a full payout. The company has been contracted to cover a quarter of the country in 2023.

Among hurdles facing agtech startups is the difficulty of connecting directly with farmers who can't afford technology or don't have the time or confidence to use it. Growers stung by microlenders in the past could also be wary of signing up for agtech offerings, says Paul Miller, vice president and principal analyst at Forrester Research Inc. Farmers should also keep expectations in check, he adds, because agriculture data models are easy to build but hard to adjust for specific geology, weather, climate and crops.

Cropin's database, Kumar says, contains information from 92 countries on 10,000 varieties of 500 crops. "With countries facing population and climate change pressures," he says, "technology is on the agenda of every farm business to help improve processes, efficiency and yield." —*Saritha Rai*

THE BOTTOM LINE A global food crisis is laying bare the need for technology to help the agricultural industry increase output. India's Cropin is among agtech startups taking on the challenge.

Preventing Cow Burps With a Pill

A supplement with methane-busting properties is an alternative to seaweed

To prevent cows from belching methane, the meat industry is experimenting with adding seaweed to their feed. But harvesters of Asparagopsis, the edible red algae that prevents the greenhouse gas from forming in bovine bellies, may struggle to meet climbing demand. One Australian startup, Rumin8 Ltd., is offering a synthetic alternative that mimics seaweed's effects.

Methane is the second-largest cause of global warming, and livestock contribute an estimated 32% ▶

◀ of emissions generated from human behavior. Just counting the 1.5 billion cows raised for meat globally, that's 231 billion pounds of methane each year. Giving cows seaweed in their feed could cut 98% of their methane emissions, according to one study.

The relatively recent discovery of the methane-busting powers of Asparagopsis has given rise to a new sector of marine farmers and producers of feed additives. Seaweed takes about four months to be ready for harvest and requires vast tracts of open water to grow; intensive farming could have negative effects on other aquatic life. And it doesn't come cheap: A report from Australia's Commonwealth Bank in September estimated that producing a year's supply of seaweed for the country's beef industry alone could cost A$132 million to A$1.62 billion ($89 million to $1.1 billion).

Rumin8, based in Perth, is bringing to market products that contain bromoform, the active ingredient in seaweed that inhibits methane production, and they're made in the lab, not the ocean. Its offerings will include a water-soluble option for free-range cattle and, for less adventurous animals, mineral supplement powders and an oil-based liquid that can be mixed into feed pellets. A slow-release formula in the form of a large tablet is in the works, too.

Laboratory trials conducted by Rumin8 have shown that the additive can reduce emissions from cows by more than 95% and that the final product will cost no more than 10% of an animal's value over its lifetime, says David Messina, co-founder and chief executive officer. Large-scale animal trials are scheduled through this year and next. Rumin8, which is backed by San Francisco-based venture capital firm Prelude Ventures LLC and Australian pension giant Aware Super Pty, expects to start manufacturing in Western Australia in 2023.

Some scientists urge caution, however, regarding the use of seaweed and synthetic alternatives because of their high levels of bromoform, which is banned under the Montreal Protocol, the landmark 1987 environmental treaty that identified chemicals that deplete the ozone layer. While there isn't yet extensive research about what happens to bromoform once it's ingested by livestock, industry suppliers say the concerns about bromoform are unwarranted. A spokesperson for FutureFeed, a Brisbane, Australia-based producer of a commercial Asparagopsis additive, says there isn't enough seaweed in the company's livestock feed to damage the ozone layer, and Rumin8's Messina says bromoform almost completely breaks down in an animal's stomach after about three hours, after which point he says it has no impact on the environment.

These assertions are supported by a May 2022 review of literature published in *Algal Research*, an international academic journal. The nine authors led by Christopher Glasson of New Zealand's University of Waikato—including three who are involved in commercializing the use of Asparagopsis for methane mitigation—wrote that microorganisms involved in cows' digestion decompose the bromoform from algae added to their feed. In concluding, they wrote that "large-scale aquaculture of Asparagopsis, and its application in methane mitigation strategies for ruminants at or near minimum effective inclusion levels, may not negatively impact animal health, food quality and ozone depletion."

Algae-based feed additives and their alternatives have yet to make a dent in methane emissions from livestock. The commercial supply chain is in its infancy, and there aren't yet incentives for farmers to buy the supplements or regulatory processes to oversee their use. Options that aren't seaweed-based are being studied, such as burp masks and a biochar feed additive. Dutch nutrition company Royal DSM NV makes a nitrate and bio-alcohol feed additive, but it would require more frequent feeding of animals for maximum impact, which makes it impractical for free-range cattle. Also, scientists in New Zealand are in the early stages of developing an anti-burp vaccine. Including more fat in cattle diets can reduce methane output by as much as 24%, says Alex Chaves, professor of animal nutrition at the University of Sydney's School of Life and Environmental Sciences. That's safer than working with bromoform, he says, calling the substance toxic and unsustainable.

Various approaches may be needed with the amount of methane in the atmosphere increasing at record rates, including the largest spike last year since monitoring started four decades ago. "For the last 30 years, we've spent millions, maybe billions, of dollars trying to mitigate this. We've learned lots, but our success has been quite small," says Chaves. "We have to stop this idea of the 'silver bullet.'" —*Sybilla Gross*

THE BOTTOM LINE Cattle belches make the meat industry a major generator of methane. An Australian startup's feed additive is among the measures proposed to cut the gas, but it's too soon to declare any a winner.

ILLUSTRATION BY BRENDAN CONROY. BALDWIN TANG & JULIANNE WILKINSON/BLOOMBERG

Fashion and Function

SLabs is using chips to track its clothing and open up new services

For Iddris Sandu, clothing is about more than keeping someone warm or making a fashion statement. The entrepreneur wants to build an ecosystem to track the origin, ownership history and real-time value of each piece. His fledgling LNQ brand includes a hoodie, a sweater and clogs embedded with chip technology, which he says could also be used to open up new digital services.

Sandu is the 25-year-old founder of Spatial Labs, a software infrastructure company focused on web3 tools. SLabs, based in Marina del Rey, California, raised $4 million of preseed funding from Jay-Z's Marcy Venture Partners and is working on a Series A funding round.

But it's not clear whether there is consumer demand for the products the company is creating, says Campbell Harvey, a finance professor at Duke University's Fuqua School of Business, given that smartphones and watches already allow people to make purchases and gain admittance to events. "Everybody wants to use the word 'web3,'" Harvey says. "In terms of my template of a successful business in the area, first I assess if this is a problem. Then, is the best way to solve this problem with blockchain technology?"

In an interview, Sandu discusses his idea. The conversation has been edited for clarity and length.

What is the problem you're trying to address?

We feel we're simplifying and authenticating products for consumers, and also allowing brands and creators to capture postsecondary sales through "royalties" earned on an item.

Why focus on physical assets?

The problem is that today, creators are not protected in the same way that the web has common licenses to protect people online. People are not protected as they sell physical products. There's no way for them to be able to know who's buying their items, as well as what it's selling for. We're giving people and brands the ability to know where your items are being sold, as well as capture some of those sales that you wouldn't ordinarily be getting.

Our solution allows the traditional consumer to think about all of their everyday products—not just clothing, but the different objects that they buy throughout their days. We envision somebody going to a thrift store, tapping on items and being able to tell which person held this item and increase the value of that item over time. It breaks it down in a very simple way and demystifies all the speculation around NFTs [nonfungible tokens].

Whom are you targeting?

It's the consumer that wants to get immersed in the world of the blockchain but is confused, with all the conversations around NFTs. The majority of people that hold NFTs today can only hold them to be able to have bragging rights. Objects that you own in the real world have fixed utility, meaning even if they didn't have a digital value to them, or even if people weren't willing to pay for that item, it would still have a function.

Why start with clothing?

Fashion is just our entrance into what we believe is the future: the metaverse of things. You're accustomed to buying clothing all the time, but imagine if your clothing could now work for you and increase in value based on the interactions you've had and even people that have acquired that item before you did. All of that can be verified on the blockchain. So you could see who owned it, you could have the ability to use it to pay for things or get into events. Even if you decided to not use the LNQ ecosystem at all, it would still always give you that fixed utility.

What does LNQ offer to brands?

When you buy a product in the store, the only way for brands to collect data and network with you is through your email. LNQ One Chip gives brands an ability to see how their products are performing in real time, using chip technology. We're also giving brands the ability to capture postsecondary sales of an item, irrespective of where it's sold or where it ends up. We offer a number of data points around user segmentation and introduce a new model of royalties for brands and consumers within physical products. We're also partnering with a number of beauty brands that are thinking about how they can use the technology to create unique experiences for their customers. —*Jennifer Zabasajja*

Arriani Arroyo's bedroom in July 2022

The Tragedi

Kids as young as 8 have died attempting online challenges. Is social media to blame?

es of TikTok

By Olivia Carville
Photographs by Dave Kasnic

"Sissy's tangled!"

The 5-year-old boy's panicked cries echoed down the hallway of the Arroyos' three-bedroom clapboard house in Milwaukee. It was February 2021, and he'd been playing with his 9-year-old sister, Arriani, before bedtime. Their mother was at a Bible study class, and their father was in his basement workshop, out of earshot. The boy had watched Arriani climb atop a toy chest, wrap a metal dog leash around her neck and hook the buckle to the wardrobe door hinge. Now she was hanging 2 feet from the ground, kicking and desperately scratching at her neck.

A few days later, after Arriani was buried wearing a princess dress and tiara, her nails freshly painted, the boy told his parents what had happened. They were playing a game, he said, like they saw on TikTok.

The game had a name: the blackout challenge. Kids around the world were choking themselves with household items until they blacked out, filming the adrenaline rush they got regaining consciousness and then posting the videos on social media. It's a modern incarnation of choking dares that have been around for decades, only now they're being delivered to children by powerful social media algorithms and reaching those too young to fully grasp the risk.

There was no press coverage of Arriani's death, and TikTok didn't learn about it for months. But the company was aware that kids not old enough to have profiles on its app were dying doing the blackout challenge. In the weeks before, TikTok's trust and safety team, which works to protect users and defend the company's reputation, had begun investigating a similar incident in Palermo, Sicily. A 10-year-old girl, Antonella Sicomero, had been found hanging from a towel rack in January with a bathrobe belt around her neck. Antonella's parents told local media she'd died playing "an extreme game on TikTok." The Palermo prosecutor's office opened an investigation, and Italy's privacy watchdog ordered the social network to remove any user in the country whose age it couldn't verify as being over 13, alleging that it was failing to abide by its own rule to keep preteens off the app.

A small group from trust and safety spent days reviewing every clip Antonella had recently watched, according to two team members who saw a summary of the internal report into her death and requested anonymity because they weren't authorized to talk to the media. There were a lot of videos: The report said Antonella, whose school was closed because of Covid-19, was on the app as much as 10 hours a day. The group also learned that, like many kids her age, Antonella had claimed she was older than 13 when she created her account.

The team reported finding no evidence that TikTok's algorithm had recommended the challenge to Antonella. That was a relief to senior executives, the team members say. A crisis management strategy was drafted to distance TikTok from the tragedy, painting it as an industrywide issue. The company told journalists the challenge "had never been a trend" on the platform and said users learned about it "from sources other than TikTok."

TikTok has continued with the same message, including in a recent statement to *Bloomberg Businessweek*, as children too young to be on social media have kept dying. The blackout challenge has been linked to the deaths of at least 15 kids age 12 or younger in the past 18 months, according to data *Businessweek* compiled from news reports, court records and interviews with family members. At least five children age 13 and 14 also died in that time. Headlines in the wake of the deaths frequently singled out TikTok, but police departments denied Freedom of Information Act requests to see incident reports that might help prove which platform was involved, if any.

By the time of Arriani's death, executives were scrambling to figure out how they could better detect and kick out children who'd lied about their age. There are no effective mechanisms to block underage users from social media platforms, an issue that's plagued them since their invention. In 2021, TikTok met with at least two providers of facial age-estimation software, which can distinguish between a child and a teenager with relative accuracy, according to people familiar with the talks. These machine-learning programs scan faces for clues about a person's age, and the companies say the systems work without identifying individuals or storing any data, which could raise privacy concerns.

Even so, a top executive at TikTok nixed the deals, one of the people familiar with the talks says. The company, owned by Beijing-based ByteDance Ltd., had been accused by regulators and politicians around the world of being a surveillance tool for the Chinese government and was facing a possible ban in the US, which is still under review. The executive, the person says, feared that using biometric data would stoke suspicions that China was spying on child users. Other social media platforms, including Twitter, Instagram and photo-sharing app BeReal, have since teamed with these age-estimation software providers.

The blackout challenge has been linked to the deaths of at least 15 kids age 12 or younger in the past 18 months

TikTok declined to comment about the meetings or why it hasn't adopted the technology. It says it removes the accounts of underage kids and took down 41 million of them in the first half of this year alone. But with more than 1 billion users worldwide, former employees say, the task is endless—just ask any young TikTok addict whether having their account deleted would keep them off the platform for more than a few minutes.

US law bars social media companies from collecting data on children younger than 13, and TikTok says it complies with the rules. Kids under that age who try to register for an account in the US are shunted to a version of the app where they can watch curated content without having a personal profile or being shown ads. But TikTok owns youth culture—it's the most popular app in the US, used by almost 70% of teens age 13 to 17, according to one survey—and the company is aware kids often lie about their age to get the adult version. And although TikTok doesn't disclose information about the age of its users, internal data leaked to the *New York Times* showed that in 2020 as many as one-third were under the age of 14.

It's a sensitive issue for the company, which tells employees to "speak of young people, but not of children," according to an internal messaging document reviewed by *Businessweek*. TikTok has been fined for letting kids onto its app, and regulators around the world are investigating its age-verification measures. It's also facing wrongful-death lawsuits in the US, alleging that its algorithm sent the blackout challenge to kids as young as 8 years old.

The ongoing scrutiny is welcome news to some of the more than two dozen current and former trust and safety workers interviewed for this article. They say the company could and should be doing more to prevent children from using the app. "The PR line at TikTok is that user safety is our No. 1 priority," says a former California-based trust and safety leader who asked not to be identified discussing internal company matters. "That's not true. Growth is the No. 1 priority. Being the No. 1 app in the world is the No. 1 priority. Making more money is the No. 1 priority."

When ByteDance spent about $800 million to merge TikTok with lip-syncing app Musical.ly in 2018, it got more than just 200 million new users. It also inherited an investigation by the US Federal Trade Commission into Musical.ly's practice of letting young kids on its app. Musical.ly had for years flouted US law, welcoming those under 13 who were locked out of competing platforms and at the same time violating the Children's Online Privacy Protection Act, which seeks to shield preteens from being targeted by advertisers.

Musical.ly's co-founder and co-chief executive officer, Alex Zhu, acknowledged at a *TechCrunch* conference in 2016 that many of the app's top users were underage. But he said it was in compliance with the law because the kids had their parents' consent. There was no point installing an age requirement, Zhu said; if Musical.ly asked for a birthdate, kids would just lie. While that may have been an honest admission, in 2019 ByteDance was fined $5.7 million by the FTC, at the time the largest child-privacy settlement in US history. (The penalty hardly took a bite out of a company now valued at $300 billion, and it was soon eclipsed by a $170 million child-privacy fine against Alphabet Inc.-owned YouTube and Google.)

At the same 2016 conference, Zhu said that what distinguished Musical.ly from other entertainment apps was its daily challenges. The company promoted a new one every day, typically generating more than 1 million videos. When Musical.ly was absorbed into TikTok, the challenges came with it.

Share of 12-year-olds in the US who have their own smartphone

41% in 2015

71% in 2021

DATA: COMMON SENSE MEDIA

These challenges resonated with teens stuck at home during the first wave of Covid. They evolved from choreographed dance routines into family-bonding trends—things like showing four generations in one video or dressing up pets. In 2020, TikTok's downloads jumped 75%. To amplify the surge, company representatives reached out to influencers to encourage them to try different challenges.

When some turned dangerous, with kids climbing stacked milk crates, chugging Benadryl or vandalizing school property, TikTok established a "harm spectrum" to help its moderators decide what could stay up and what should come down, according to Eric Han, the company's US head of safety. The cinnamon challenge, in which users ate a spoonful of powder, could lead to minor lung damage, but it was deemed unlikely to cause catastrophic harm, so the trust and safety team attached a warning to the content and left it up. They had other pressing issues to solve, including election integrity, combating hate speech and coping with the Trump administration's threat to ban TikTok over national security concerns.

Amid that chaos and the app's explosive growth, the challenges kept getting riskier. In the skull-breaker challenge, two people would trick a third to jump up between them and then trip the leaper in midair, resulting in reports of concussions and brain damage. The outlet challenge, which involves dropping a penny onto the prongs of a partly plugged-in phone charger to watch it spark, led to students being charged with property destruction. The fire challenge, in which kids doused objects with accelerant and set them on fire, sometimes ▶

◀ ended in third-degree burns. And the blackout challenge has been outright deadly.

US health officials seem to have studied deaths linked to choking games only in the years before the social media boom. A report published by the Centers for Disease Control and Prevention in 2008 found that 82 children from age 6 to 19 had died playing the choking game between 1995 and 2007, the year the first iPhone was released. The government hasn't published another study on the issue since, but anecdotal reports from researchers suggest social media has amplified the problem.

Judy Rogg became an advocate seeking to raise awareness of the choking challenge after her 12-year-old son, Erik, died playing the game in 2010, long before TikTok was created. Rogg started a nonprofit called Erik's Cause, which helps train schools about how to handle online risks and gathers statistics on choking-game-related deaths. She's found that since 2018 at least 33 kids younger than 13 have died. "It's grown more popular with social media," Rogg says. "It's absolutely exploded."

The challenges bounce across platforms, morphing into new iterations with different hashtags and code words as users sidestep safety restrictions. The blackout challenge goes by many names, from the more obvious "choking game" and "pass-out challenge," to the subtler "flatliner" and the obscure "space monkey." Kids misspell words to avoid detection, like "space monkee" or "blackout tr1ck." Videos with some of these titles exist on TikTok today, showing kids taking deep breaths and pushing on one another's chests until they faint or choking each other with their hands. You can see kids temporarily lose consciousness then wake up laughing. One caption says: "Craziest feeling ever."

More than 70% of US children have a cellphone by the age of 12, and half of all kids from 8 to 11 in the UK are viewing TikTok content daily, according to surveys in both countries. TikTok trains its moderation teams to look for underage users and draws on text-based analytics to detect keywords such as a written age in a bio. It also relies on other users to surface their accounts. Mahsau Cullinane, a company spokeswoman, declined to disclose more details, to avoid teaching kids how to "circumvent our safeguards." She did point out that TikTok released a tool in 2020 that allows parents to monitor their child's activities on the app.

A global army of about 40,000 moderators is responsible for reviewing videos at TikTok, three-quarters of whom work on contract. Each looks at about 1,000 videos a day, taking around 20 seconds to review each one, according to former employees. They say the system isn't geared toward finding underage users. Posts are filtered to moderators by artificial intelligence software that scans every video uploaded—10 billion in the first quarter of this year alone—and automatically removes anything that would violate a community guideline, such as nudity or violence. If the software is unsure, it sends the material to a human to assess. Every video that has more than about 3,000 views (the number varies across countries) is also sent to a moderator, ensuring that the most popular content gets a human review. Kids younger than 13 are unlikely to post content that violates guidelines or reaches that many eyes, though.

TikTok's moderators might be actively looking for the accounts of underage users, but they never removed Arriani Arroyo's, where she posted videos for her 260 followers. She wasn't hiding her identity: Her profile photo was a picture of her 9-year-old face. In her videos she's dancing, laughing and playing with her brother. Her last post had 457 views.

"These are the last things she ever wore," Christal Arroyo says, taking a pair of tie-dyed pajamas from her daughter's dresser. She unfolds the top delicately, revealing a jagged tear where the paramedics cut it open. "I don't like to look at them," she says, refolding the garment. "I come to smell them." Rain pelts the window, and lightning sends a shock of white into Arriani's bedroom. Arroyo doesn't notice. She has her eyes closed, breathing in her daughter's lingering scent.

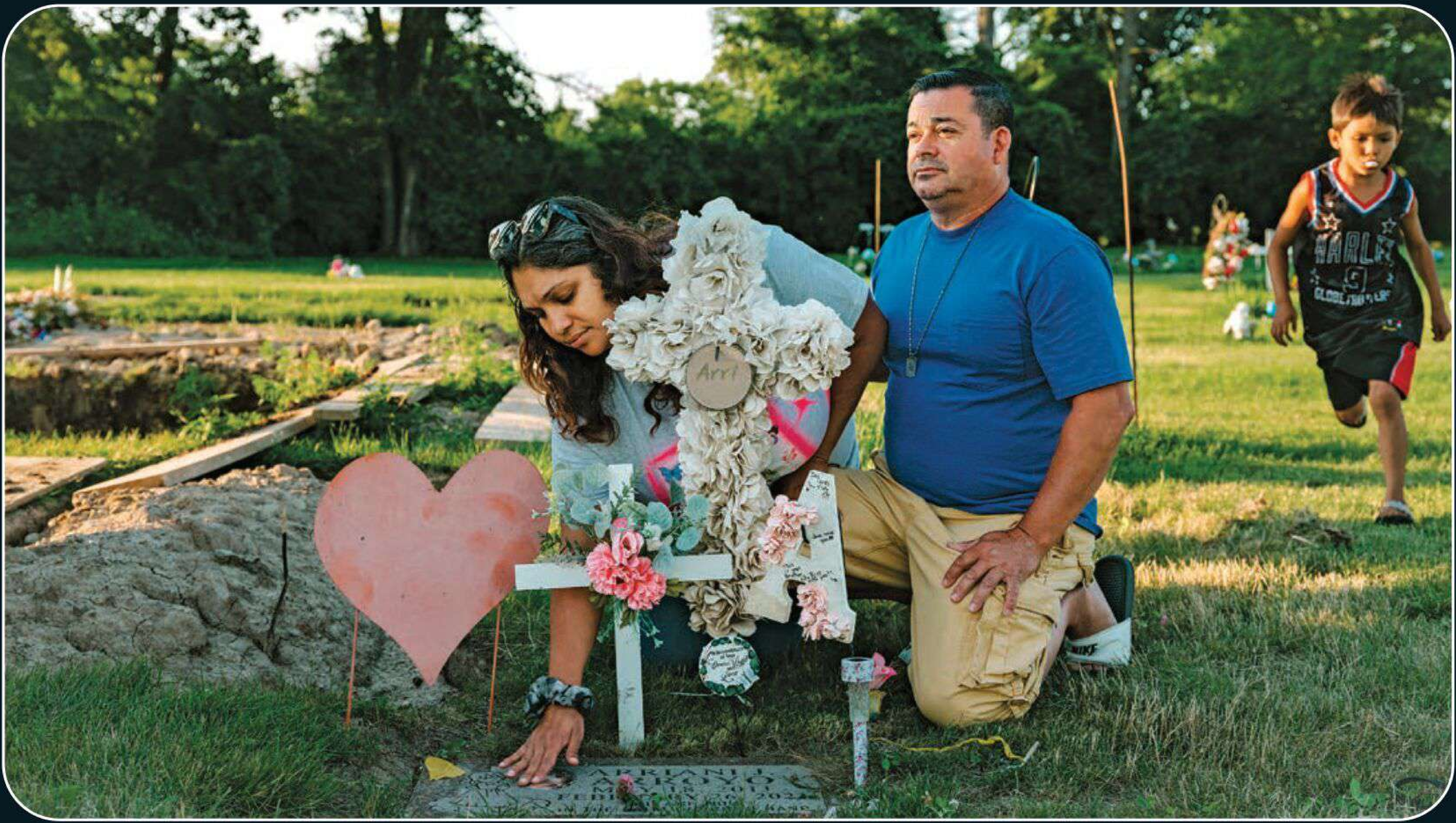
Arriani loved glitter, nail polish and fairy princess dresses. She collected seashells and wrote to-do lists in her diary: "brush teeth, pick out clothes, do hair and makeup, have fun!" Her favorite song was *Girl on Fire* by Alicia Keys, and she'd sing it during her morning routine. She'd wanted an iPhone when she turned 8—"like every kid in America," her mother says. Her favorite app was TikTok. When the pandemic shut her school in 2020, Arriani became "obsessed" with it, Arroyo says.

Arriani and her brother spent hours doing dancing trends and viral challenges. Some were innocent enough, such as holding water in your mouth until you start giggling or eating only red foods for 24 hours. They were playing together the night she died. "I've had people comment, 'Where were the parents?'" her father, Eddie Arroyo, says. "Well, I was at home that same day, that same moment, and I didn't hear anything." His son came down to the basement, where he was cutting insulation, to tell him Arriani was tangled.

"I followed him up to see what was wrong, and that's where I found her," he says, pointing toward his son's bedroom. The dog leash she'd hanged herself with had been intended for a puppy the family was planning to buy. "She couldn't breathe, couldn't scream out," Eddie says.

Some parents would pack up and leave, haunted by the memory. The Arroyos chose to remain in the house where Arriani died because it's also where she lived. Her bejeweled Juicy Couture Ugg boots sit by the bed; her pink *Sleeping Beauty* sleep mask hangs from the bedpost. They'd wanted to bury her in the cemetery across the street, whose grounds are visible through her glittery curtains. But raising five kids on Eddie's truck-driver salary—Christal is a full-time pre-law student—they couldn't afford a plot. Instead, Arriani was buried a seven-minute drive down the road.

After the funeral, the Arroyos asked Arriani's friends what game she'd been playing when she died. That's when they first heard the words "blackout challenge."



The Arroyo family at Arriani's grave

They read the news reports as more kids kept dying. Joshua Haileyesus was found in Colorado two months later with a shoelace around his neck; his father, Zeryihun, said he'd died attempting TikTok's blackout challenge. Three more children died in June, also resulting in blackout challenge headlines: Nate Squires, 13, in Massachusetts; LaTerius Smith Jr., 9, in Tennessee; and James Boyd-Gergely, 14, in Australia. In July, Lalani Walton, 8, was found hanging in her bedroom, also in Tennessee. In September, Hayden Robert Craig, 10, was found hanging from a tree in his backyard in Georgia.

Police didn't publicly link any of these deaths to TikTok. Other fatalities may have gone unreported, according to Rogg, the Erik's Cause founder. "Unfortunately, many of these deaths are misclassified as suicide," she says. The only way to prove a child was participating in the challenge or to figure out which platform was involved is for officials to conduct a psychological autopsy—an investigation of the child's online network and friendship groups to reconstruct what they may have been thinking—or order a forensic analysis of their devices to determine what they'd been watching online.

Officers in Clarksville, Tennessee, where Lalani Walton died, did just that. According to a lawsuit her parents filed, police said the analysis of her phone showed she'd spent hours watching blackout challenge videos on TikTok on a road trip the day before her death. (A spokesman for the Clarksville Police Department declined to comment.) After Hayden Robert Craig's body was found in Georgia, a policeman noticed his iPad nearby, according to an incident report seen by *Businessweek*. It refreshed to show a TikTok of a black screen with a bloody knife emoji.

Members of TikTok's Asia-Pacific safety advisory council, which consists of outside experts, raised concerns about the blackout challenge being linked to deaths in their region, too. Linh Phuong Nguyen, a Vietnamese expert in child online safety who's on the council, says several kids died attempting the challenge in Cambodia, the Philippines and Vietnam. One, from Ho Chi Minh City, was only 5. She used a piece of chiffon to hang herself from her bunk bed after viewing the challenge on YouTube. (A spokeswoman for YouTube says the platform removes blackout challenge videos and bans "any activity that prevents breathing or can lead to suffocation.")

Some on the council suggested to TikTok and other social media platforms that they build an alliance to stop dangerous challenges from spreading, people familiar with the private meetings say. But TikTok had few friends in Silicon Valley. According to the *Washington Post*, one potential ally, Meta Platforms Inc., had hired opposition researchers in 2021 to plant news stories about how TikTok was spreading dangerous challenges that had actually originated on Facebook. Meta didn't deny the smear campaign to turn the public against its biggest rival, whose format and algorithm it was simultaneously working to copy.

Cullinane, the TikTok spokeswoman, says the company takes "each and every report of an alleged dangerous act ▶

◀ or challenge incredibly seriously." After each death and headline, TikTok assigned a task force to investigate. But insiders say these inquiries were designed to deflect blame. Every time a blackout challenge headline was connected to TikTok, the team assigned to the case found evidence that the children who died were using multiple social media platforms and concluded there was no way to prove which app directed them to the challenge. In some cases the team couldn't confirm the existence of a TikTok account at all.

After Antonella Sicomero's death in January 2021 and the ban on unverified TikTok accounts in Italy, the company agreed to reverify the ages of the country's 12.5 million users. It wound up deleting half a million accounts. TikTok also told its regional managers to keep an eye out for any blackout challenge content in their markets, removed videos promoting such content and ended users' ability to search for it in the app. TikTok declined to reveal how many videos were removed, but Cullinane says the company has never found any evidence of the challenge trending on the platform. She points to a survey it commissioned that year showing that only 0.3% of teens said they'd taken part in a challenge they considered "really dangerous." The global survey also found that 2% said they'd participated in challenges they deemed "risky and dangerous."

Despite the measures TikTok has taken, the deaths keep happening. Last December, 10-year-old Nylah Anderson hanged herself with the strap of a handbag at home in a suburb of Philadelphia. After her death, her mother, Tawainna Anderson, found cellphone videos of Nylah and her cousin playing an asphyxiation game and reported it to the police.

An officer wrote in an incident report that the cousin told him "it was a strangulation challenge they saw on TikTok and YouTube." According to a wrongful-death lawsuit against TikTok and ByteDance that Nylah's mother filed in federal court in Pennsylvania in May, a forensic analysis of Nylah's phone showed TikTok had sent her a video that encouraged her to place a purse on a coat hanger in a closet, position her head between the bag and shoulder strap and suspend herself until she blacked out. The company "unquestionably knew that the deadly blackout challenge was spreading through their app and that their algorithm was specifically feeding the blackout challenge to children, including those who had died," the complaint said.

In July the Social Media Victims Law Center in Seattle filed a second suit, on behalf of the parents of Arriani Arroyo and Lalani Walton. The center, founded in 2021 by Matthew Bergman, a product liability lawyer, has brought more than 40 lawsuits against TikTok, Meta, Snapchat and YouTube alleging mental health harms, social media addiction and wrongful death. Bergman, who spent his career suing asbestos manufacturers, says he turned his attention to social media last year when he heard about Meta whistleblower Frances Haugen leaking documents describing the ways Facebook was harming teens. These platforms "are experimenting with our children and putting profits over people," Bergman says.

The lawsuit filed by the Arroyo and Walton families alleges that TikTok is liable for their deaths because its algorithm recommended the challenge to the girls and was unable to stop it from spreading. In August the case was amended to add another plaintiff, the grandmother and legal guardian of Zaiden Baldwin, 11, who was found hanging behind a shed in New Mexico earlier in the summer. He'd told his older sister he'd seen blackout challenge videos on TikTok and wanted to try it, the complaint says. The case is pending, and TikTok hasn't filed a response.

"The last thing in the world these companies want to do is stand up in front of a jury and explain to them why their profits were more important than life," Bergman says. "They are going to employ every legal artifice they possibly can to avoid that reckoning, and we're going to fight as hard as we can to hold them accountable." In September a third lawsuit against TikTok was filed after a 13-year-old boy died attempting the blackout challenge, also in New Mexico.

Cullinane, the TikTok spokeswoman, says that her sympathies are with the families but that she can't comment on pending litigation. In July the company filed a motion to dismiss the Nylah Anderson lawsuit, claiming it has "no legal duty of care to protect against third-party depictions of dangerous activity." TikTok contended in the motion that it's shielded by Section 230 of the Communications Decency Act, which says tech platforms can't be held liable for the content published on their sites. In October a judge dismissed the case, agreeing that TikTok couldn't be sued even if it had recommended the challenge to Nylah. Her mother's lawyers have filed an appeal.

The Supreme Court may have something to say about the matter. In October it agreed to hear an unrelated case about the scope of Section 230's immunity provision. Its decision could allow the blackout challenge lawsuits to proceed—or wipe them out.

"They have these solutions ready to go. They could implement them almost immediately"

Social media platforms are under increasing pressure from lawmakers to do more to protect children. In September, California Governor Gavin Newsom signed an online privacy law, modeled after the UK's age-appropriate design code, that forces tech companies to prioritize children's best interests over commercial ones. The California code, set to take effect in 2024, requires companies to estimate the age of a child user "with a reasonable level of certainty." A federal bill, which also has a section on age verification, advanced out of a Senate panel with bipartisan support this summer. That bill, the Kids Online Safety Act, requires the National Institute of Standards and Technology to spend a year studying how platforms can accurately verify age while safeguarding minors' privacy.

That's always been the balancing act for tech companies: safety versus privacy. If they use facial-recognition technology or ask users for government-issued identification, such as a driver's license or passport, they're criticized for breaching privacy rights and hoarding personal data. If all they do is ask users to enter a date of birth, they're attacked for not doing enough to protect kids who lie about their age. And any friction introduced by age verification is antithetical to the message contained in a TikTok internal document reviewed by *Businessweek*: "Our ultimate goal is to increase daily active users."

Looming regulatory pressure has forced the age-assurance issue to the fore, leading some of the biggest social media platforms to hire third-party age-estimation companies in the past 18 months. Unlike facial-recognition technology, which seeks to identify a person and depends on storing millions of images, age-estimation software doesn't retain, share or reuse data, according to Julie Dawson, chief policy and regulatory officer at digital-identity company Yoti Ltd. Yoti is based in London and works with Meta-owned Instagram; its software has studied hundreds of thousands of faces with known ages, and it's programmed to break an image into pixels, analyze the patterns and estimate how old the person is.

Last year, Yoti demonstrated the technology to TikTok in private meetings, Dawson says, adding, "As of now, they haven't decided to do it." TikTok has also met with Hive, a San Francisco company working with Twitter Inc. and Reddit, according to three people with knowledge of the matter. Those discussions, which began in early 2021, also haven't gone anyplace.

Dawson says TikTok was "quite worried" about the optics of allowing a third-party software provider to use its biometric data. That February, ByteDance had agreed to pay $92 million to settle a class-action lawsuit brought in Illinois by users who accused the company of using facial images without their consent for targeted advertising. TikTok disputed the allegations, but four months later it altered its privacy policy to grant the app express permission to collect "faceprints and voiceprints" of its users. In October its executives were grilled in Congress about how they planned to use that data. They avoided the question but said TikTok collects less data than other social media companies.

The problem, says Michael Rich, a pediatrician and director of the Digital Wellness Lab at Boston Children's Hospital, is that "these companies don't see their users as customers to be served, they see them as a product they are selling." Platforms don't seriously enforce age restrictions because it's not in their best interests to do so, he points out. "It's no news to anybody that the companies go through the motions of age-gating but are not enforcing it super-hard."

Marc Berkman, CEO of the Organization for Social Media Safety, a consumer-protection group, says TikTok is harming children by not using third-party age-estimation software. "The protections they have are not adequate," says Berkman, whose group offers educational advice on how to keep kids safe online. "They have these solutions ready to go. They could implement them almost immediately. They choose not to. That's serving a business interest, not a safety interest."

Two more deaths took place in August. Archie Battersbee, a 12-year-old in Essex, England, passed away after spending months on life support. He'd been found unconscious with a ligature around his neck. His mother told reporters he'd been trying the blackout challenge, though a coroner found no evidence to back that up. Also in August, Leon Brown, 14, was found unresponsive in his Scotland home. Local news reports said his friends had told his mother Leon saw the blackout challenge on TikTok and was trying it with them on a video call.

"My question to TikTok," says Christal Arroyo, "is what are you going to do to change the platform? Because at this point it's not safe for anyone, and it's definitely not safe for any child." Arroyo says her happiness died with Arriani. "A social media app," she muses in a bewildered tone. "I never thought in my mind that could ever result in me losing my daughter."

In a video taken with a mobile phone a few weeks before she died, Arriani sits in the back seat of her parents' car, wearing a ruffly pink top with blue flowers. Her dark hair is pulled back, with flyaway hairs curling above her ears. She's holding the phone with one hand, the camera so close you can see she recently lost one of her baby teeth. "Don't care about what other people say about you," Arriani says. "Be confident and be passionable because everyone in this world is beautiful." She blows the camera a kiss and makes a peace sign. "So, bye," she says, smiling.

Businessweek sent the video to Hive, one of the software companies that met with TikTok. Its machine-learning model broke down the clip into frames and scanned each image to arrive at an age estimate for Arriani. "The technology to do this is definitely there," says CEO Kevin Guo. "But maybe these platforms prefer not to understand the scope of this issue."

Hive's model took three seconds to estimate that Arriani was 10. She died three months shy of her 10th birthday. Ⓑ

THE CANARY IN THE TEA FIELD

Not long ago, Sri Lanka was an economic success story. With stunning swiftness, it's become a cautionary tale of corruption and financial fragility

By Matthew Campbell

A plantation near Kandy. Inset: Police fire water and tear gas to disperse protests against President Gotabaya Rajapaksa in July

THE CENTRAL HIGHLANDS OF SRI LANKA ARE TEA COUNTRY. Lush plantations climb the hillsides, and trucks loaded with 40-kilogram (88-pound) bales of tea leaves clatter down winding roads, bound for the port of Colombo.

But during a recent visit to the Geragama tea estate on the outskirts of Kandy, Sri Lanka's second city, few bales were going out. The country is experiencing one of the most severe economic meltdowns to strike any nation in decades, and like virtually every business, Geragama was struggling to obtain basic materials. The price of fertilizer had gone up ninefold since 2019, while electricity shortages forced it to rely on a generator for at least a few hours each day.

Geragama had cut the number of workers for each shift at its processing plant in half, to 15, and their wages were being devalued by galloping inflation. Dawatapola Watte Irangani, a 68-year-old laborer, explained as she tended to a drying kiln that, with energy prices soaring, she could no longer afford to cook at home with gas, as she had for decades. Instead, Irangani, who has a deeply lined face and leathery, muscular hands, cut down a tree in her garden to produce firewood that sent smoke billowing through her house. When that ran out, she foraged for more in the jungle. "I don't remember a time this difficult," she said. A widow, Irangani is the sole breadwinner for her household, including two grandchildren she's cared for since the death of her son. "I worry a lot about their future," she said, "and whether they'll have jobs when they grow up."

Stories like Irangani's have become shockingly common in Sri Lanka. Only three years ago the World Bank classified its economy as upper middle-income, in the same category as Brazil and Turkey. On health metrics such as life expectancy, it was comparable to China or Poland. Today the United Nations estimates that as many as 7 million of its 22 million people require urgent humanitarian assistance, with many at risk of malnutrition.

The depth of the Sri Lankan collapse has been stunning. Like many developing economies, it relies on imports of food, fuel and fertilizer. Russia's invasion of Ukraine has constrained supplies and substantially raised the prices of all three, compounded by the surge in value of the US dollar, the currency required to buy these commodities. Gasoline and diesel are being strictly rationed, and anyone who needs more than their weekly allocation must buy it from black-market traders, who fill up cars from jerrycans at two to three times the official price.

But global trends were just the spark for an economic tinderbox that's been growing more dangerous in Sri Lanka for more than a decade. For all but about five years since 2005, the country has been ruled by the Rajapaksa family, a sprawling political clan that has variously occupied the offices of the president, prime minister, finance minister and defense secretary. Spurning traditional allies in India and the US, the Rajapaksas reoriented Sri Lanka's foreign and economic policy toward China and borrowed from its state lenders to pay for lavish infrastructure projects. They also ushered in what critics say was an era of operatic corruption, with billions of dollars in public funds siphoned off and secreted abroad.

This year, Sri Lankans pushed back, staging massive street protests against the family's rule. Prime Minister Mahinda Rajapaksa, who also served as president from 2005 to 2015, resigned in May, and his younger brother, President Gotabaya Rajapaksa, did the same in July after a mob stormed his official residence. Gotabaya fled to Singapore but returned to Sri Lanka in September, and Colombo buzzes with rumors that the Rajapaksas, who retain loyalists across the government, are plotting a return to power. They declined requests to be interviewed for this story.

For now, a caretaker government is trying to contain the economic fallout. Sri Lanka is in talks to restructure its more than $40 billion in foreign debt and expects to reach an agreement with the International Monetary Fund on a bailout by early next year. That may not help ordinary citizens in the near term, however. "One by one, small industry, medium-scale industry is being closed down. Food prices are going up to three times 2019 figures," says Patali Champika Ranawaka, the chairman of the Sri Lankan Parliament's committee on economic stabilization. "The worst things are yet to come."

A LAWYER AND MEMBER OF PARLIAMENT (MP) FROM Sri Lanka's rural south, Mahinda Rajapaksa was elected to the presidency in 2005, during a brutal civil conflict that was already in its third decade. The two sides—the central government and the Liberation Tigers of Tamil Eelam, who sought an independent state for Sri Lanka's marginalized Tamil minority—killed civilians, tortured prisoners and assassinated enemy commanders. In the 1980s and '90s the LTTE, better known abroad as the Tamil Tigers, pioneered the use of suicide bombings as a guerrilla tactic.

To end the fighting, Mahinda turned to his brother Gotabaya, a longtime army officer who'd emigrated to California. In what was surely one of the most radical career changes in Los Angeles history, Gotabaya left his job as an IT administrator to return to Sri Lanka as secretary of defense. He oversaw a series of relentless offensives against the LTTE, forcing its fighters into ever-smaller patches of territory. According to a UN report, as many as 40,000 civilians may have been killed in the process, in some cases from shelling in what the government had claimed were no-fire zones. The LTTE effectively surrendered in May 2009, after the death of its leader, Velupillai Prabhakaran.

Finally at peace, Sri Lanka was open for business. For Mahinda, Gotabaya and their brother Basil, who became minister of economic development, this meant seeking investment from China rather than democratic countries such as India, the regional superpower. According to a former government official who asked not to be identified because of fears of retaliation, Indian leaders repeatedly voiced their displeasure about this development in private meetings. But China had emerged from the global financial crisis stronger than ever, and its infrastructure-led development model ▶

PLANTATION: PYURIKO NAKAO/GETTY IMAGES. PROTEST: PRADEEP DAMBARAGE/GETTY IMAGES

◀ had obvious appeal for a country that needed to rebuild.

The Rajapaksas' flagship proposal was a pair of major infrastructure projects—a giant marine terminal and an international airport in the southern district of Hambantota. The area was remote and underdeveloped, with families of elephants roaming its sunbaked plains. But it had a key advantage: It was the Rajapaksas' ancestral home and electoral stronghold. Both projects, along with an expressway connecting them to Colombo, went ahead, funded largely by borrowing from China, and their costs ballooned.

The expected price of the airport in 2006, when it was still in the early stages of design, was $60 million to $70 million, according to a US Department of State cable later made public by WikiLeaks. By the time it opened in 2013, it cost $244 million, three-quarters from a Chinese loan. Virtually no airlines wanted to serve Hambantota, and it was so quiet that some of the traffic on its taxiways came from peacocks busting through the perimeter.

The seaport didn't fare much better. China extended $1.3 billion in loans for the project, which, like the airport, was built by Chinese construction companies. It was obvious the costs were hugely inflated, according to a foreign diplomat who worked on infrastructure matters in Colombo. But the Rajapaksa government was happy to proceed, feeding what the diplomat describes as a "perception that the Chinese were rather adept at spreading the manure." The result: an underused terminal whose total revenue in 2014 amounted to $9 million.

Graft infected government business of all kinds. In 2010 state-controlled Sri Lankan Airlines (SLA) began examining options to replace its aging planes. According to a later official inquiry, executives originally proposed a "staggered" acquisition, to keep costs manageable. The following year the government installed a new chief executive officer, Kapila Chandrasena, who'd previously run a smaller airline set up by the Rajapaksa administration. He joined a new chairman, Nishantha Wickramasinghe—Mahinda Rajapaksa's brother-in-law.

SLA's procurement strategy soon turned aggressive, calling for the company to spend $2.3 billion on at least 11 new Airbus widebodies. According to a UK court filing, as Airbus staff negotiated the sale they learned that a third-party consultant named Priyanka Neomali Wijenayake would be involved. British investigators would later note that Wijenayake had "no aerospace expertise," but she did happen to be married to Chandrasena, SLA's CEO.

In 2013, Airbus and Wijenayake made a deal: For each plane successfully delivered, her company would receive a payment from Airbus of $1 million or more, plus a one-time $5 million award if SLA refrained from buying aircraft from archrival Boeing Co.—for a total of almost $17 million. Ultimately the carrier took delivery of only seven of the planes it originally sought, and Wijenayake's company received only $2 million.

A worker sorts leaves at the Geragama tea estate

The deal later became one of the subjects of a joint investigation by the US, the UK and France into Airbus's use of "agents" to secure sales around the world. As part of a 2020 deferred prosecution agreement with British authorities, Airbus admitted to entering into a consulting deal with Wijenayake and to paying her. She and her husband denied wrongdoing.

Efforts to bring corruption to light in Sri Lanka sometimes proved hazardous. Lasantha Wickrematunge, editor of a weekly paper called the *Sunday Leader*, led one such investigation, into a deal by the Sri Lankan air force to buy fighter jets from Ukraine. The paper reported that a company that was supposed to receive $15 million for the planes didn't appear to exist—and suggested that Gotabaya Rajapaksa had been involved in embezzling some of the funds. Gotabaya denied the allegations and sued for defamation. Wickrematunge refused to back down, even after someone delivered to him a funeral wreath and a newspaper dipped in red paint. On it was scrawled "If you write, you will be killed." Not long afterward, in January 2009, a group of black-clad men on motorcycles surrounded Wickrematunge's car at a crowded intersection. They smashed the windows, then struck his head with a sharp object, puncturing his skull. He died later that day.

None of this seemed to dent Mahinda Rajapaksa's popularity, particularly among Sri Lanka's Sinhalese majority. His family enjoyed considerable legitimacy from its role in ending the civil war, and Chinese investment and increased tourism had touched off an economic boom across much of the country. New luxury hotels crowded the white-sand beaches of the south and west coasts, and celebrities flocked to the island for five-star honeymoons. In Colombo, traditionally a sleepy city of narrow lanes and low-slung bungalows, developers from China announced plans for malls and skyscrapers that wouldn't be out of place in Shenzhen. From 2009 through 2014, gross domestic product climbed almost 90%.

Given Rajapaksa's stature, political observers were surprised when the opposition candidate, Maithripala Sirisena, won a narrow victory in 2015's presidential election. During his campaign, Sirisena had promised to rebuild ties to countries such as India and Japan and had warned that the Rajapaksas' heavy borrowing from China and other lenders could turn Sri Lankans into "slaves."

One of the first priorities for Sirisena's government was to recover pilfered assets, which one senior official publicly claimed could amount to $18 billion. Yet according to a person involved with asset-tracing efforts, Sri Lanka had almost no ability to carry out complex financial investigations, and government agencies were stocked with Rajapaksa loyalists. One former official recalled how when he arrived at his new job, in an important financial body, he found its lower ranks swelled with employees from the family heartland in Sri Lanka's deep south. Officials tried to train corruption specialists, while also seeking help from the US, which sent investigators to Colombo to gather information. But agencies such as the FBI, two people familiar with the matter say, were reluctant to share information, fearing it would leak to the

Then-president Mahinda Rajapaksa arrives for the Hambantota port opening in 2010

Rajapaksas. The largest chunk of ill-gotten funds was believed to be in Dubai. Yet according to one of the people, authorities in the United Arab Emirates dragged their feet on turning over the requested records, ultimately providing nothing of substance. (In a statement to *Bloomberg Businessweek*, an Emirati official said that Sri Lanka had failed to provide "information required by UAE authorities" to process its requests and that the UAE "stands ready to assist" with future inquiries.)

Meanwhile, the Rajapaksas were nearing a return. Their moment of opportunity arrived on Easter Sunday 2019, when suicide bombers carried out coordinated attacks at churches and hotels around Colombo. The explosions, in which 269 people were killed, were set off by an Islamist group. With national attention focused on security, an issue on which the Rajapaksas had ample credibility, Gotabaya declared his intention to stand for the presidency. (Mahinda was blocked from doing so by term limit rules.) He won a comfortable victory in elections held that November, then appointed Mahinda as prime minister and finance minister and gave another brother, Chamal, an economic portfolio. Eventually, Mahinda's son Namal was appointed minister of sports and youth affairs, and Basil succeeded Mahinda as finance minister.

Once again, government in Sri Lanka was a family business.

THE SOUTHERN EXPRESSWAY BEGINS NEAR SRI LANKA'S west coast, in the Colombo suburbs, paralleling the shoreline southward in a rough quarter-circle. Pristinely paved, with US-style service stations and, in its farther reaches, electrified fencing to deter wandering elephants, the road is nothing like the narrow and twisting thoroughfares that link most Sri Lankan towns. Its construction was supposed to transform transportation in the region, allowing easier commutes and helping farmers and factories bring goods quickly to buyers.

During a drive to the deep south in mid-October, the expressway was almost empty; fuel shortages and toll costs have put long journeys out of reach for many drivers. The road ends in Hambantota, in view of the Chinese-built cranes of the new port. The facility has been controlled since 2017 by China Merchants Port Holdings, a state maritime company ▶

WORKER: PHOTOGRAPH BY PRADEEP DAMBARAGE FOR BLOOMBERG BUSINESSWEEK. RAJAPAKSA: DINUKA LIYANAWATTE/REUTERS

◀ based in Hong Kong, which paid the Sri Lankan government $1.12 billion for a 99-year lease. US military strategists said they feared the deal could create a foothold for the Chinese navy, and a person familiar with the matter says American diplomats lobbied against it furiously. Left with few options for raising cash after the Rajapaksa years, the Sirisena government went ahead anyway.

Successive Sri Lankan leaders have said they won't allow Hambantota to be a base for any foreign military, and for now it remains a commercial port—a quiet one. It certainly hasn't brought prosperity to the area. Outside the local hospital, R.M. Lakmali Perera was selling lottery tickets and medical masks in a stall built of sheet metal. Until recently, she explained, her husband had earned a decent income as a bus conductor. But his shifts had been cut because of the lack of diesel, and Perera's earnings, about 700 rupees ($1.91) a day, were now their main income. "It's never enough," she said. Food had become so expensive that she could afford to give her two teenage daughters only two meals a day. Perera was eating just one, with whatever was left over. "I'm so angry, but what is there to do?" she asked.

The chain of events that led most directly to Sri Lanka's financial distress began right after Gotabaya Rajapaksa assumed the presidency in late 2019. His first major policy initiative was a package of sweeping tax cuts, including an almost 50% reduction in sales tax. Billed as a stimulus measure, the changes eliminated as much as a third of government revenue. Sri Lanka made up the gap with more borrowing, which it attempted to fund, in turn, by the central bank printing money.

Economic experts were flabbergasted. Harsha de Silva, an economist and opposition MP, suggests that the Rajapaksas were convinced by "a wrong interpretation of Modern Monetary Theory"—a philosophy holding that governments can spend liberally without fear because it's always possible to create more money. But even MMT's advocates don't call for applying it beyond "monetarily sovereign" countries such as the US, which can easily sell debt in their own currency. In Sri Lanka the predictable result was a series of downgrades by rating agencies, making the dollar-denominated debt it needed for imports more expensive. What's more, the pandemic arrived to devastate one of the country's primary sources of foreign exchange: tourism. After accounting for about $3.7 billion annually from 2015 through 2019, on average, tourism earnings tumbled in 2020 to less than $700 million.

In April of the following year, Gotabaya announced an even more startling change: an immediate ban on imports of chemical fertilizer. The stated goal was to catalyze a national switch to organic farming, but more immediate financial pressures were also part of the story. Sri Lanka was looking at an outlay of as much as $400 million for 2021 fertilizer imports, requiring dollars it increasingly didn't have.

The effects were devastating. Crop yields plunged, including on tea plantations, whose exports another key source of hard currency for Sri Lanka. Senthil Thondaman, president of the Ceylon Workers Congress, a political party representing plantation employees, says he warned Gotabaya that the sector couldn't transition to organic agriculture overnight. "I told him, 'I'm a practical man. I know what's possible and not possible,' " he says. But the president "never took into consideration that this industry might crash."

IN APRIL, DANISH ALI, AN AUSTRALIAN-EDUCATED SRI LANKAN who works as a consultant to students on foreign visa applications, joined the growing crowd on Galle Face Green, a rectangular lawn in the heart of Colombo where some were pitching tents for a long-term occupation. Economic conditions had grown dire. Foreign-currency reserves were down to $50 million, from $7.6 billion at the end of 2019, making it impossible to import everything from medicine to coal. Electricity was being cut for as long as 12 hours a day, and some gas station lines were so long there were reports of people dying while waiting.

Ali's business was suffering, too. Attending university overseas, relatively common during Sri Lanka's boom years, had become an impossibility for all but the most privileged, leaving Ali badly short of clients. And it was growing harder to serve the ones he still had. He didn't have a generator, and when the power went out, he had to hope his laptop and phone had enough juice to get him through the workday.

The protesters on Galle Face had gathered to make a simple demand, expressed with the Instagram-friendly hashtag #GotaGoHome. More broadly, Ali says, they wanted to express their anger at a political system "set up to corrupt, to make money for politicians and the people who work for them." At first the atmosphere was festive. Then, about a month in, a group of pro-government counterprotesters, some carrying knives and clubs, approached the camp. Witnesses reported that police appeared to step aside to let them through. "They attacked us," Ali says, "and the people gave a real answer." Demonstrators fought back, clashing with police and torching homes owned by the Rajapaksas and their allies. Nine people were killed. The ensuing nationwide anger was too much even for Sri Lanka's ruling family. Mahinda stepped down as prime minister immediately. Gotabaya held out until July, when a crowd burst through the gates of his official residence. As images of protesters swimming in the presidential pool were broadcast around the world, he announced his intent to resign.

The Sri Lankan government is now led by President Ranil Wickremesinghe, a political veteran with a reputation for blandly technocratic competence. His administration faces some titanic challenges. Sri Lanka suspended payments on foreign debt in April, triggering the first sovereign default in its history. It's now in restructuring negotiations with its creditors: a mix of foreign governments including China, India and Japan, as well as investors who hold its sovereign bonds. Securing a fair agreement with China, which accounts for 52% of Sri Lanka's bilateral debt, could prove to be the most challenging problem. "The signals are that China is ready to support Sri Lanka," says Nandalal Weerasinghe, the governor of Sri Lanka's central bank. But in restructuring talks with other debtors, China has been extremely reluctant to accept reductions in the total to be paid back, preferring to offer refinancing or extended repayment timelines. Sri Lanka's other creditors, whether private investors or governments, will resist a deal offering less favorable terms than China receives.

A resolution that clarifies Sri Lanka's financial position will be essential to unlock a bailout from the IMF, the next phase in restoring stability. The country and the fund have already agreed in principle to the terms, which include a $2.9 billion loan. The IMF's board must now approve the agreement, which could happen early next year. The fund's imprimatur would allow Sri Lanka to begin borrowing money from other international lenders again.


Sagara and his family at their farm

Policymakers are keen to emphasize that a bailout is only an initial step. To really end its current crisis and prevent future ones, Sri Lanka will have to make some fundamental changes—cutting spending, raising taxes, reining in graft. On the last item, the early signs aren't encouraging. In a recent letter to President Wickremesinghe's office, Ranawaka, the MP who chairs the economic stabilization committee, pointed out a curious trend. When striking agreements to procure gasoline and diesel early in 2022, the Rajapaksa government paid a premium—the difference between the wholesale price of a given oil product and the final amount charged—of $3 to $6 per barrel. But in July and August shipments, the premium soared to $25 or more a barrel. It's not clear what accounts for the increase or who might be benefiting from it.

Meanwhile, the Rajapaksas aren't far from the stage. Since Gotabaya's departure, the family's public face has been Mahinda's son Namal, a 36-year-old with an informal manner and an active Twitter profile. The relevant comparison may be to the Marcos clan in the Philippines. Dictator Ferdinand Marcos fled the country in 1986, after a popular uprising against the corruption and impunity that defined his rule. But his successors failed to deliver real change, and voters came to see the disgraced leader in a more positive light. This year his son Bongbong was elected president.

AS THEIR COLLAPSED ECONOMY GRINDS INTO 2023, Sri Lankans are being forced to contemplate problems more commonly associated with the world's poorest nations. "We have a new emergency of food security and malnutrition, which is going to have lasting impacts on the productivity of our workforce," says Anushka Wijesinha, CEO of the Centre for a Smart Future, a think tank in Colombo. "There is going to be scarring, in terms of education and malnutrition, for a very long time." This pain could also cause a new eruption of popular protest, especially if tax increases and spending cuts fall hardest on the bottom of society. Whereas the #GotaGoHome movement was led by the relatively prosperous—people who, Wijesinha says, had felt "a very immediate hit to their lifestyle"—the next wave of unrest might be driven by the desperate poor.

It's hard to imagine how things could get worse for many of them. M.G. Sagara, a farmer, grows rice and vegetables on his 1.5-acre plot, not far from the road linking Colombo to Kandy. Before the 2021 fertilizer ban, Sagara says, "we were very comfortable." He grew enough to feed his wife and three children, with whom he shares a tin-roofed house by the edge of his vegetable garden, and to earn extra cash by selling the surplus. Although Gotabaya's government relaxed the prohibition on chemical fertilizer after several months, only a trickle is entering the country, and high prices put it out of reach for small-scale farmers. On his nearby paddy, Sagara says his rice plants would normally be about 3 feet high. Instead the scraggly stalks reached perhaps a foot off the ground. He'd shifted to selling firewood gathered by hand in the nearby jungle. "I have no experience to do another job," he says. "I have to survive."

Sagara and his wife had gone fully vegetarian, stopped buying milk powder and cut back to two meals a day. He was most upset by the effect the crisis was having on his children's education. His middle son—a handsome 12-year-old who hung around as Sagara spoke, wearing only a pair of green checked shorts—was preparing to take an exam that could win him a scholarship. But the family could no longer afford tutoring. At one point, Sagara says, growing visibly emotional, the boy had suggested that he join a monastery so his parents wouldn't have to worry about feeding him.

Sagara emphasized that he didn't want to criticize any specific leader. But he was clear about who he thought deserved blame for what had happened to him and his family: "Politicians did this to our country." B —*With Sudhi Ranjan Sen, Anusha Ondaatjie and Ben Bartenstein*

PHOTOGRAPH BY PRADEEP DAMBARAGE FOR BLOOMBERG BUSINESSWEEK

The Green Owl Is Very Flu

Duolingo has a cult following and a grandiose mission. Can the language-learning app educate the world for free and still satisfy Wall Street?

By Bill Gifford ❤ Illustration by Inji Seo

Translations, clockwise from top left:
1 "Anyone can cook" in French
2 "Good night" in Korean
3 "Why are you eating the yellow snow?" in Czech
4 "My strange uncle lives in a lighthouse" in Gaelic
5 "All men must die" in High Valyrian

After dinner on Aug. 23—a date he will never forget—Tobi Fondse pulled out his phone to do his daily Duolingo. He was studying French on the language-learning app so he'd be able to order *croissants au jambon* and *bière à la pression* on his frequent visits to France, "instead of having to point at things," says the 50-year-old Dutch IT consultant.

He'd tried Babbel, Busuu and other language apps but preferred Duolingo because its lessons were fun. They didn't feel like a chore. He and his wife, Marisa, had completed at least one lesson for more than 400 consecutive days, placing them among Duolingo's most dedicated paying users. "I'm deadly serious about learning French," he says.

But as the app opened that summer evening, the lesson modules he was used to suddenly vanished. Duolingo's mascot, a cheerful and slightly passive-aggressive green cartoon owl named "Duo," flitted across his screen to announce a major change: Instead of picking and choosing which lessons they did—matching vocabulary words, listening to brief stories, learning how to order food or shop for clothes—Fondse and other users would now be required to follow a prescribed path from lesson to lesson. It looked like some kind of children's board game, and worse—it felt like homework.

Fondse was stunned. Then he got angry. Now "you always have to do what the app tells you to do," he says, bitterly. So he decided to fight back, creating the Twitter account @Duo_is_sad, along with a petition, to beg the company to reverse the update.

That hasn't happened, despite a vast, noisy backlash that's spread across Twitter and Instagram to the very active Duolingo subreddit. Update-bashers flooded the comment thread at "DuoCon," Duolingo's all-online conference held in late August, and the company abruptly shut down the user forums on its website, which had run for years. Things got more heated when Luis von Ahn, Duolingo's co-founder and chief executive officer, dismissed the complainers in a TV interview as "change-averse."

The anger eventually spilled over to Duolingo's freewheeling TikTok account, where 5 million followers flock to see Duo the owl twerk in the office and mock the company's execs. One commenter captured the prevailing mood in eye-rolling, teenager speak as: "L update."

To which the company's social media manager replied with a post featuring Duo screaming, "HELP ME!!!"

Before the Hated Update of 2022, you'd be hard-pressed to find anyone with a bad word to say about Duolingo, aside from a few grumpy linguistics professors. It won Apple's iPhone App of the Year in 2013, the year after its release, and has since been downloaded more than 600 million times. When the pandemic hit, the homebound flocked to Duolingo to learn Italian or Korean or one of the 41 other languages it offers. As the economy reopened, people picked up the app again, this time to prepare for actual plans to travel abroad. It's one of the rare products whose fans include Bill Gates and Khloé Kardashian.

As Duolingo's popularity has spread, so have the memes featuring Duo, the needy owl who reminds users to do their daily lesson. In one classic, Duo is depicted holding a gun, saying "Beg for your life in Spanish." Twitter fans like @shitduosays and @DuolingoDark collect the often-deranged sentences the algorithm serves up, like "Why are you eating the yellow snow?" in Czech, or "Do you love mayonnaise or do you love me?" in German. *Game of Thrones* die-hards can learn basic High Valyrian on the app, and Trekkies can practice their Klingon.

But Duolingo's customer base includes not just honeymooners bound for Puerto Vallarta and wannabe Targaryens, but also immigrants and refugees. More than half of its users live outside the US, and the most popular language on the app, by far, is English. Syrian refugees study Swedish in Stockholm, while the Russian invasion prompted a surge in people learning Ukrainian to assist those displaced by war. Even once-dying languages are getting a Duolingo boost; more people study Gaelic on it than there are native Gaelic speakers. Twitter co-founder and dedicated user Biz Stone summarized Duolingo's unusual duality in an April tweet: "The gamification on @duolingo would be evil if it weren't for a good cause."

The app's vibe is more *Candy Crush* than high school French class. When you open it to begin a lesson, you're greeted by a succession of cartoon characters who deliver a handful of brief, relatively easy exercises in the language you're studying: matching vocabulary words, translating simple phrases, listening to and repeating sentences using sophisticated speech-generation and -recognition technology to mimic native speakers. When you're done, the owl high-fives you, your "streak" is extended and you win points that determine your standing on a leaderboard within one of several ranked leagues. The more points you earn each week, the more elite your league, and the more the app nags you to study still more. As you progress, you also earn "gems," a form of in-app currency you can use to purchase a more difficult lesson, or a "streak freeze" that preserves your standing should you—God forbid—miss a day. The whole thing takes about four minutes, just enough time for someone who's waiting for a bus or train, or trying to avoid talking to their stepdad while being driven to soccer.

The goal is to make it feel as little like studying as possible, explains Duolingo senior learning scientist Cindy Blanco, who has a doctorate in linguistics from the University of Texas at Austin. "The idea is that you learn by doing—by engaging with the language," she says, describing its "implicit learning" approach. Behind the scenes is a massive machine-learning system that compiles and analyzes data from a billion user interactions every day, helping to refine and customize each person's course. That means as I progress through beginner Spanish, it recognizes that I often mix up the gender of common nouns—like *vestido* (dress), which for some bizarre reason is masculine—and politely drills me on it. It also knows that I prefer to be nudged to complete my lessons at 6 p.m., not 6 a.m. "We see our competition as the things we are competing for your attention and time with on your phone, like

Instagram and TikTok," says Sam Dalsimer, Duolingo's global head of communications. "We are not trying to get school districts to choose us—we're trying to get your family to choose us, and not play video games."

This formula has largely worked, transforming what began as a graduate student's Ph.D. project into a corporation with more than 500 employees and a $2.7 billion valuation. Von Ahn took the company public in July 2021 at $102 a share, just as pandemic stocks hit their peak. Within a few months its price almost doubled, but the shares have since fallen more than 60% from their high. Duolingo has managed to avoid face-planting like Peloton, Shopify and other pandemic winners-turned-losers, and it's now trying to make the leap from beloved freemium app to profitable business.

Von Ahn at Duolingo's Pittsburgh headquarters

The app has almost 15 million daily active users, up 51% from a year ago, according to the company's most recent earnings. Most of these enthusiasts aren't paying anything, opting for a free, ad-supported version instead of shelling out $12.99 a month (in the US) for a Duolingo Plus subscription. By focusing on growth over revenue, Duolingo has dominated the language-app category, accounting for almost two-thirds of all downloads and usage, according to market intelligence firm Sensor Tower Inc. "It turns out that our free product is better than most other language-learning apps' paid product," says von Ahn, at the company's headquarters in Pittsburgh. His strategy is to expand Duolingo's pool of users until it's so huge he needs to convert only a fraction of them into the paying subscribers who help foot the bill for the rest. The company's mission, he insists at every opportunity, is "to develop the best education in the world, and make it universally available."

This type of nonprofit-speak can sound overly idealistic, particularly coming from a longtime academic now running a publicly traded tech company. Von Ahn introduced two more free apps this year—DuolingoABC for basic reading and literacy, and Duolingo Math, which teaches basic skills such as multiplication—and says he has no plans to make money off either anytime soon, and that's just fine. "It's not like I'm against making money, but it has never been a top priority," he says. "If you do things that are impactful, then money will follow."

It's certainly easier to do when you have more than half a billion dollars in the bank and little debt. The 10-year-old company's paying subscribers have more than tripled since the pandemic began, to 3.7 million. Revenue is expected to surpass $365 million this year, up 45% from last year.

Finding new ways to squeeze money out of its fans might come with a cost. By November the app update had rolled out to nearly all users, to more fuming. "Woeful, repetitive, and uninspired," tweeted crime author Ian Rankin. "Merci et auf Wiedersehn." Because the new design offers fewer choices, it has the effect of pushing people to spend money on in-app purchases. Match Madness, for example, is a timed challenge that asks users to rapidly match vocabulary words, then prompts them to buy a "timer boost" when the clock inevitably runs out.

The company explained in a blog post that its new default setting is "more effective from a teaching standpoint." But in its latest earnings call, von Ahn and Chief Financial Officer Matthew Skaruppa explained that there are other motives, too. "In-app purchase revenue is a priority for us," von Ahn said, adding, "we're going to be trying just to make sure it does not decrease any learning outcomes."

As a kid growing up in Guatemala, von Ahn often visited his grandparents' candy factory. The older he got, the more fascinated he became with how the candy was made. "I would kind of sneak in there on weekends and play with the machines," he says. "Then I started taking them apart."

He couldn't figure out how to put the machines back together again, though, and was eventually banned from the factory. But he'd already learned valuable lessons—not only about making gummy bears, but also about how a company that produces a cheap, well-loved product can still fail. "I learned a lot about a dysfunctional family business, and I saw all the stuff they were doing to run this company into the ground," he says.

Von Ahn never intended to become an entrepreneur, but his mother always had ambitions for him. One of the first women in Guatemala to complete medical school, she found herself wanting a child, despite being single at age 42. She persuaded one of her medical school professors to get her pregnant, without any pressure to stay in the picture. "She said, 'Look, I just wanted to find the smartest person I knew,'" says von Ahn, who bears his late father's last name. "The more time passes, the more I realize what my mom did was kind of crazy."

Von Ahn's mother put everything into her son's education, enrolling him in the American School of Guatemala, alongside the children of wealthy Guatemalans and foreign diplomats. He went to Duke University, and then to Carnegie Mellon University for graduate school in computer science, receiving his doctorate for inventing Captcha, the authentication ▶

PHOTOGRAPH BY ROSS MANTLE FOR BLOOMBERG BUSINESSWEEK

◀ tool used by millions of websites—which he gave to Yahoo! for free. He improved that technology with reCaptcha, this time selling to Google for "tens of millions of dollars" in 2009. (His big splurges since then: a Lamborghini, a $22.5 million townhouse in Manhattan and flying his mom—who now lives with him in Pittsburgh—out of Guatemala via private jet early in the pandemic.)

Instead of retiring as a 30-year-old multimillionaire, von Ahn began to think about the role learning English at a young age had played in his success. "I am from a very poor country, but I happen to have received the education of a rich person," he says. He wanted to find a way to offer free language lessons to anyone with a phone, and began working with a German-speaking Swiss graduate student named Severin Hacker. Together with a team of graduate students and researchers at Carnegie Mellon, where von Ahn was now a professor of computer science, they developed the program that ultimately became Duolingo. To study teaching methods that might work online, they "literally went out and bought books like *Spanish for Dummies*," von Ahn says. Their goal, he explained in a 2011 TEDx talk, was to "translate the whole web into every major language."

Initially, von Ahn and Hacker thought they could build a business model based on reCaptcha, whereby people would translate a snippet of text from a news article and publishers would pay for it. The idea proved cumbersome to execute, so they pressed on without a plan to earn revenue. Von Ahn had contemplated applying for an academic grant, but didn't feel like doing all the paperwork; instead, he says, he took seed funding from Union Square Ventures, actor Ashton Kutcher and investor Tim Ferriss to develop the app. "This guy is an engineer's engineer," says Ferriss.

When Duolingo launched as a website in June 2012, the dominant player in computer-based language instruction was Rosetta Stone, famous for the $700 CD-ROMs it sold from mall kiosks. After a decade of consistent losses, the company was taken private in 2020 and pivoted to selling to schools and businesses. Duolingo took a different approach: "No ads, no hidden fees, no subscriptions, just free," a promo promised. Its lessons would feel more like a game than an academic exercise. (Hacker, now Duolingo's chief technology officer, declined to be interviewed; like von Ahn, he still owns about 10% of the company.)

Later that year, Duolingo debuted as a free app, drawing 10 million downloads in its first 12 months and becoming the first educational app to win the Apple accolade. Despite having millions of users, the startup had no revenue and no real plan to earn any. Still, Union Square's Brad Burnham was impressed by how often people came back and says he was confident that "sooner or later there will be a way to make a living with this audience."

By early 2016, Duolingo had completed four rounds of funding and had a $500 million valuation, but investors were getting itchy. Efforts to generate revenue the previous year had yielded a grand total of $400,000. "My partners at Kleiner said, 'You gotta get a real CEO in there, because he's a starter, he's an inventor, but he doesn't understand business and he doesn't show any interest,'" says Kleiner Perkins's William "Bing" Gordon, whose firm invested in 2015. Von Ahn kept his job but agreed to bring on Bob Meese, the former global head of games at Google Play, Android's app store, as Duolingo's chief business officer.

Duolingo already looked and felt a little bit like a video game; Meese wondered if it could make money like one, too. The company had a close relationship with Google; its independent venture fund CapitalG was an early investor, and von Ahn had worked there after selling reCaptcha. So Meese sent Duolingo engineers to the tech giant to train in machine learning and study how YouTube used ads to generate revenue.

In 2017, Duolingo debuted a subscription version of the app, which was almost identical to the free version, with a couple of new features and no ads. Revenue began climbing, reaching $70 million in 2019—and then doubled in 2020 as millions of users suddenly discovered a productive way to pass the time in lockdown. The company spent far more on R&D than marketing, and within a year revenue had doubled again. Rather than stay private, von Ahn decided he was ready for an initial public offering. "Companies that last a very long time," he says, "are usually public companies."

"'You gotta get a real CEO in there, because he's a starter, he's an inventor, but he doesn't understand business and he doesn't show any interest'"

When Duolingo first fired up its TikTok account in 2020, it typically featured education influencers teaching a word or two in their native language. The videos averaged a couple hundred thousand views—until September 2021, when Zaria Parvez, the company's 24-year-old head of social media marketing, spotted an owl mascot suit slumped next to her desk. She posted a video of Duo hovering over her, captioned "When you're just tryna do your work without being terrorized by an owl." Over 3.5 million views later, the company realized it had found a whole new way to keep its fanbase hooked.

Since then, the owl has gone on an office bender that would get any normal employee fired from any normal company: stalking pop star Dua Lipa (rhymes with "Duolingo") on company time; posting a video of general counsel Stephen Chen, a frequent nemesis, with the caption "I crop dust in Whole Foods"; and deploying salty but on-brand hashtags like #fgoogletranslate. It's all part of the joke, aimed at a generation glued to their phones and raised on reruns of *The Office*.

Duolingo has leaned into its cheeky side, but it also sees opportunity tackling issues that are personal for von Ahn. Although he describes his managerial style as "conflict avoidant," it isn't uncommon for him to get into Twitter spats with the current and former presidents of Guatemala, in Spanish. "I hate them," he says bluntly. "They are extremely corrupt." After the US Supreme Court struck down *Roe v. Wade* in June, he warned Pennsylvania politicians on Twitter that Duolingo might leave the state if they enacted restrictions on abortion. His personal foundation recently gave $3 million to support organizations promoting environmental protections, an independent press, and education for girls and women in Guatemala. "If you really want to improve a country, you want girls to have education," he says. "It's better that the moms are smart, because the dads are gone."

Two particular thorns in von Ahn's side since he was a teenager are the Test of English as a Foreign Language (Toefl) and the International English Language Testing System (Ielts), the standard English-language tests required of applicants to universities in the English-speaking world, as well as those seeking visas in certain countries. When he applied to Duke, he had to fly to neighboring El Salvador to take the Toefl, spending more than $1,200, a huge sum in Central America. "These are businesses that have been around for 50 years, and they're extractive—they're like, 'We charge 200 bucks because we can,'" he says. "That's a month's salary in some places."

Von Ahn figured Duolingo was in an ideal position to compete with the big English-certification test organizations, so in 2016 it began working on an online version that would cost a fourth as much as the standard assessments. "Everybody told us it's not going to work," he says. And for a long time, it didn't.

That changed with the pandemic, when the in-person testing centers used by Toefl and Ielts all shut down. Suddenly, Duolingo's $49 online test became the only viable option for many students. Test volume jumped tenfold in two months, and universities began signing on. Today the Duolingo English Test is accepted at more than 4,000 institutions, from Stanford University to the Midwives College of Utah. The product generated about $25 million in revenue for the company last year; refugees can take it for free.

ETS, the nonprofit behind the Toefl, derides Duolingo's test as largely machine-driven, "which puts the validity and fairness of scores at risk when used for high-stakes admissions decisions," says Srikant Gopal, ETS's executive director for the Toefl. Plus, he says, it only requires a five-minute writing sample, not exactly a rigorous barometer of English fluency. (Duolingo says "our correlation studies suggest a very strong relationship" between Duolingo English Test and Toefl/Ielts scores.)

It's a criticism frequently leveled at Duolingo as a whole: that it's too automated, not serious, not effective and generally too app-y. In a widely read 2015 blog post, language coach Kerstin Cable asked pointedly, "Is Duolingo wasting your time?" She faulted the app for, among other sins, its too-brief lessons and lack of guidance and explanation of key grammatical concepts. The app has improved considerably since then, Cable acknowledges, but the question remains: Just how well can you learn a language from your phone?

Depends on whom you ask and what your goals are. Duolingo touts a company-funded, non-peer-reviewed study showing that its learners reached proficiency equivalent to four semesters of college study in about half the time. A more recent company-funded study found that English learners achieved respectable fluency after a few months.

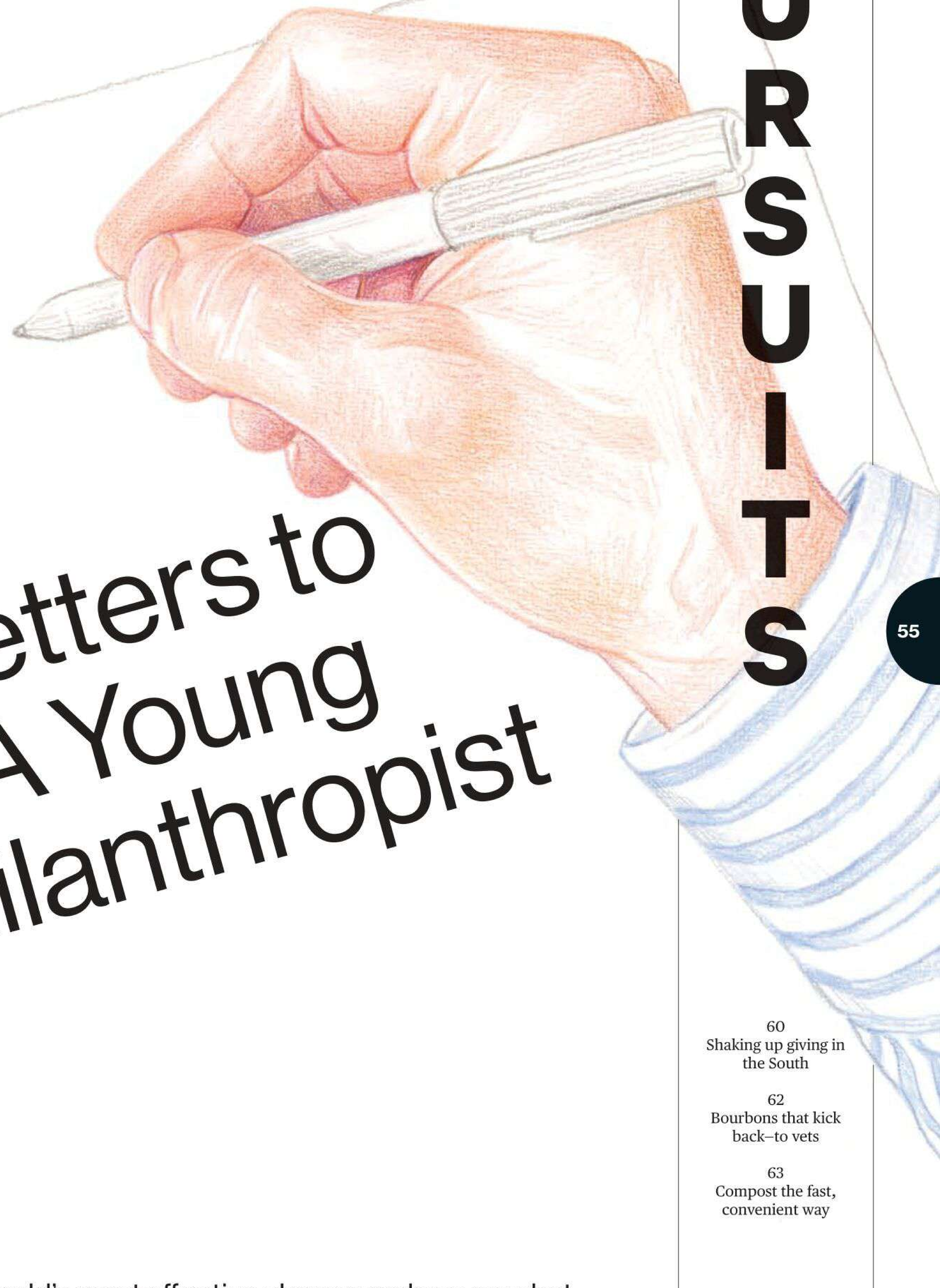
Shawn Loewen, a professor of linguistics at Michigan State University, had 10 graduate students spend a semester studying basic Turkish on Duolingo. Only one of them managed to pass a first-semester college Turkish exam afterward. "Most of us would have failed the class, based on that test," Loewen says. "But we all did know more than when we started." (Duolingo admits that Turkish, like Mandarin and some less-popular languages such as Navajo, is among its more modest curriculums.)

Loewen recently completed a follow-up study comparing the effectiveness of Duolingo and Babbel, the Berlin-based language-learning app that's been around since 2007 and has sold 10 million subscriptions at $80 a year. Babbel is more formal, more didactic and also entirely subscription-based. "It's not about the game, and there are no machine-made phrases," says Babbel US CEO and Chief Revenue Officer Julie Hansen. The differences in the two are obvious: Duolingo speaks the visual language of games like *Angry Birds*, while Babbel feels more like a textbook. (Loewen's study found that Duolingo and Babbel users achieved equal proficiency after eight weeks.)

Still, it's clear that Babbel—which was set to go public in September 2021, then pulled the IPO at the last moment—wants to borrow some of Duolingo's addictive juju. It recently expanded its live course offerings with paid, dedicated instructors. "We want it to be like Peloton," Hansen says. Meanwhile, Duolingo is hungering for more subscriptions. Last year it introduced a $120 "Family Plan," which allows up to six people to use the premium version. "As long as any other people in your family are still using it, you're not going to stop paying," says von Ahn. (Fondse, the unhappy Duolingo fan, has discovered a workaround that allows him and his wife to continue using old-school Duolingo until the end of the year. "After that it will be Babbel," he says in an email.)

Duolingo's real secret, says Arieh Smith, a popular YouTube and TikTok polyglot who goes by @xiaomanyc, is that it makes language learning seem easier than it really is. He spends weeks on end studying new languages, with native speakers as tutors, and then posts videos of himself shopping for groceries in Chinese or ordering breakfast in Igbo, a Nigerian tribal language. The learning process, Smith says, is "grueling." "If you look at how hard it's been traditionally to learn a language," he says, "it's f---ing hard."

But if you're a fan of *Squid Game* and just want to learn a little bit of Korean, one of the fastest-growing languages on Duolingo, the app makes it easy to start. "You won't get fluent," Smith says. "But it's a good gateway drug." Ⓑ



Letters to A Young Philanthropist

Some of the world's most effective change makers on what they'd tell their 18-year-old selves before embarking on a life of service

By Mark Ellwood and Chris Rovzar

Illustrations by Uli Knörzer

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Edited by Chris Rovzar

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The world's greatest philanthropists weren't always so sure they'd end up changing the world. In fact, they started out like most every other teenager on Earth: unsure, unknown, and oblivious to the challenging paths ahead. How did they get from there to here? What did they learn along the way? What lessons would they share?

As fortunes are made and lost in the blink of an eye, and buzzwords like "effective altruism" blaze across the headlines, we wanted to know.

So we approached seven philanthropists who, through their significant work and contributions, have made the world a better place. But instead of just asking them for advice they'd give anyone, we asked them what advice they'd give *themselves*. Each has written a letter to him- or herself at the age of 18. Although the missives are personal, the teachings are universal—and essential for anyone setting out to help others.

For more inspiring letters from philanthropists, see bloombergpursuits.com.

Beverly Tillery

Executive director of the New York City-based Anti-Violence Project, Tillery, 56, worked as an organizer, educator and strategist at such nonprofits as Lambda Legal and Amnesty International before taking up this role. She's focused on securing a world where all LGBTQ and HIV-affected people live safely and free from violence.

Dear 18-year-old Beverly,

Looking back on 30 years of social justice work, I'd tell you to "operate from a place of more abundance and love."

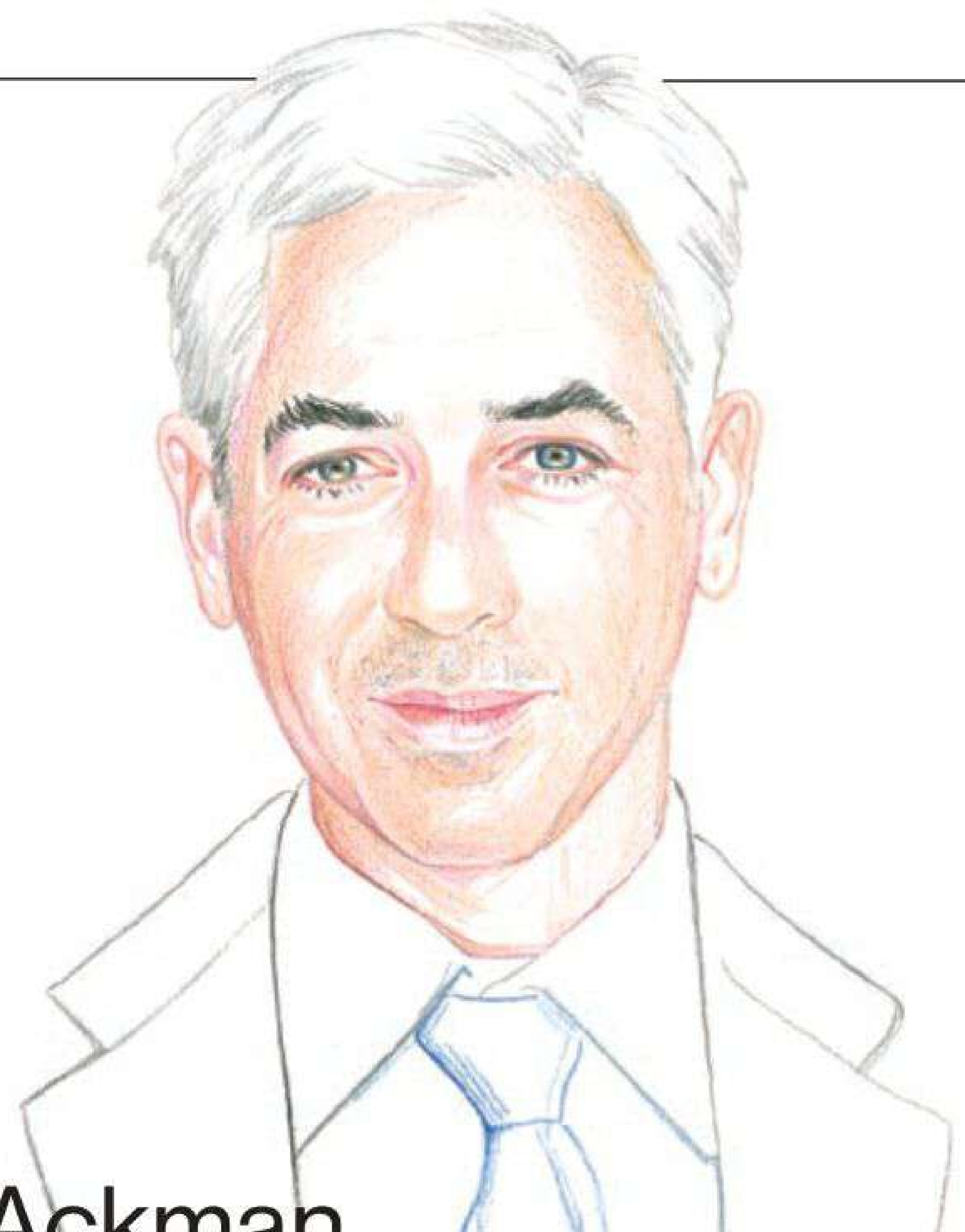
That mantra comes from my work early on as an organizer, when I saw a colleague yelled at for putting a broken chair out for trash. The chair was dragged back inside, and she was expected to work sitting on it. That moment stayed with me, because I knew we all needed and deserved more than the broken chairs we were given to succeed.

Over time, I've learned that ***even though our organizations are often under-resourced, we can and should act from a place of abundance rather than scarcity.*** *We must demand more for our communities and constituents, and ourselves. And we should never believe the myth that there is not enough to go around, or that we or our organizations have to compete for crumbs or settle for less.*

Hate can be an important and powerful motivating tool, and at the same time, hate without the counter of love can be disillusioning and demoralizing. Part of what has helped me continue in this work for so long is that I love even more fiercely than I hate. I am driven by my love for my community and the power of people to come together to create beauty despite the pain and harm. No matter how angry I am about the state of the world, ultimately my love for Black people, queer people, people of color, survivors of violence and other marginalized communities keeps me going, and I hope that comes through in what I do and how I live.

Beverly

ILLUSTRATIONS BY ULI KNÖRZER



Bill Ackman

The 56-year-old founder and chief executive officer of Pershing Square Capital Management LP is also chairman of the Howard Hughes Corp. and a member of the board of Universal Music Group NV. Ackman and Neri Oxman are co-trustees of the Pershing Square Foundation, a family foundation that's committed more than $600 million in grants and social investments in areas including health and medicine, education, economic development and social justice.

Bill,

I used to believe that business was about making money and philanthropy was about doing good. With the benefit of substantial business and philanthropic experience over the past 30 years, I have come to learn that for-profit solutions to most problems are substantially more likely to succeed than nonprofit solutions. In other words, ***you don't need to work for a nonprofit to do good.*** *Good can come from business success even if the pursuit of profit is the primary objective of the business. That said, the ideal impactful career would be to work for and/or build a profitable company where its success is highly correlated with an important save-the-world ambition, Tesla being a good example. Imagine a nonprofit trying to convert the world's automobile fleet from carbon fuels to electricity.*

Business success also creates resources and influence. Resources and influence are important levers for impacting the world and doing good. When I graduated from college, those who pursued lower-paying jobs in the philanthropic sector seemed to have the moral high ground. In retrospect, that shouldn't have been the case. Don't be ashamed about pursuing your dreams in the capitalist system, as your prospects for impact are substantially better than in the nonprofit world.

All of the above said, for certain problems there is no for-profit solution today, or at least someone hasn't thought of one. And it is here that your profits from success in business can be allocated to address issues where capitalism has to date failed to provide a solution. In selecting among nonprofit organizations, ones that are managed in a businesslike manner with clear objectives and models that allow for eventual self-funding, rather than reliance on donors, are generally the best options for investment.

Bill

Sharna Goldseker

The founder of 21/64 aims to connect the philanthropic goals of different generations. Hence the organization's name—21 is when young people come of age, while 64 is when people often begin focusing on their legacies. Goldseker, 47, is also co-author of *Generation Impact: How Next Gen Donors Are Revolutionizing Giving.*

Dear 18-year-old Sharna,

Historically, people became "philanthropists" at the sunset of their lives. Yet the needs are great, and problems take time to address, and only youth can afford that luxury of time. So this is what I would whisper into your ear if I could, with 30 years of hindsight:

"You won't be able to change the world overnight, but you have decades ahead of you in which to make an impact, and you have the access to philanthropic dollars that can help fuel that change. Work hard and humbly, earn your right to a seat at the table, but don't wait until you retire to become a philanthropic change maker. Start now." What's more:

** Fund earlier, even if it's on a smaller scale.*

** Pool gifts with other donors to leverage your own.*

**** Work for and with community-based organizations to learn from them and be a supporter of their efforts with your talents, treasure, ties and time.***

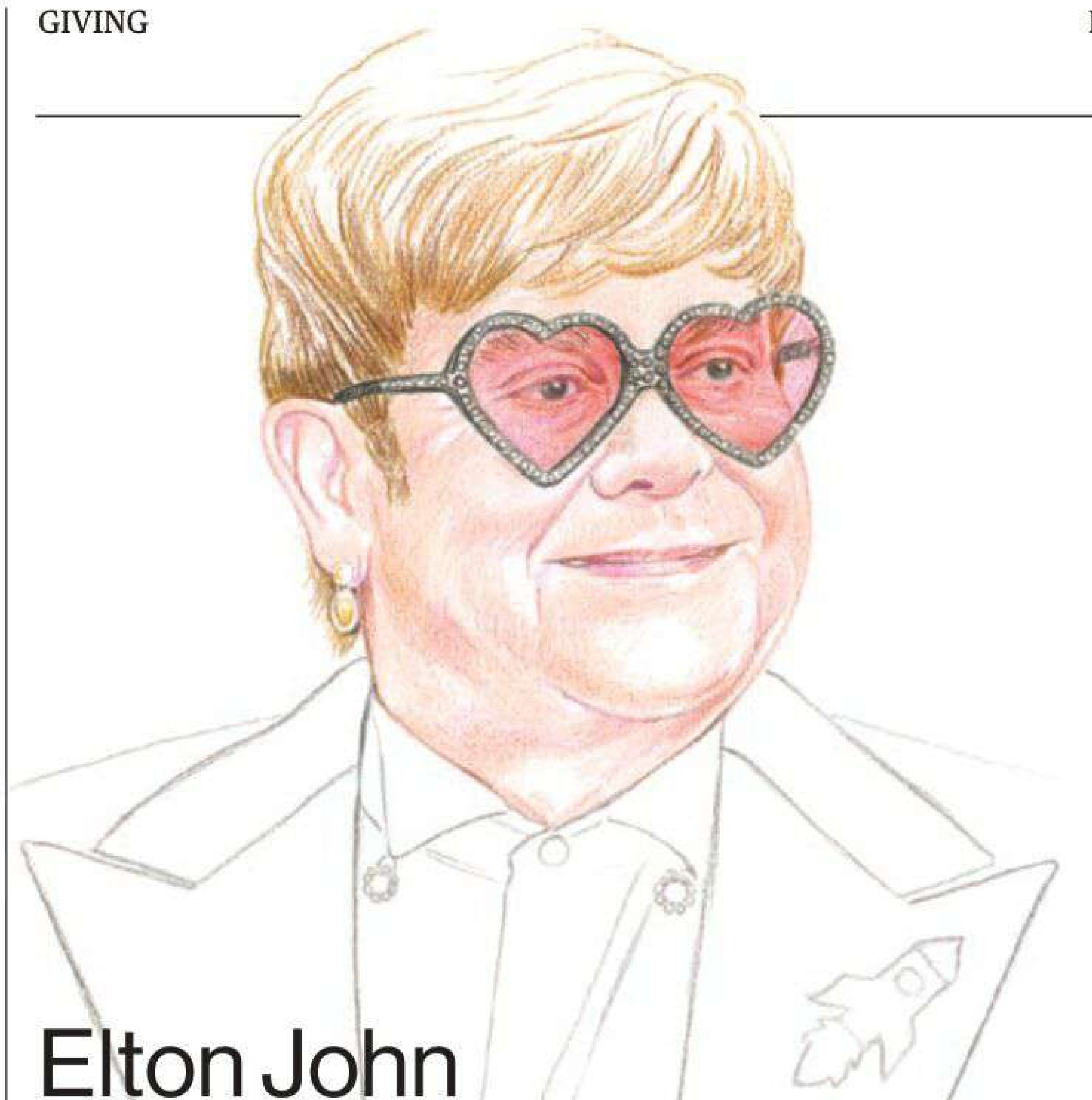
** Take risks and invest in new ideas, even though they won't all pan out.*

** Don't worry about being identified as a donor, because there are bigger issues in the world than being asked for money and feeling uncomfortable about it.*

** Most important, craft a vision for change and work toward it for decades, knowing it may take that long.*

** Embrace your identity, and you'll find like-minded partners along your journey. You're not alone.*

With Gratitude,
Your Older Self



Elton John

Born Reginald Dwight, the 75-year-old is a Grammy-, Tony- and Oscar-winning singer and a member of both the Songwriters and Rock & Roll halls of fame. Thirty years ago he started the Elton John AIDS Foundation, which has become one of the most impactful nonprofits working with HIV/AIDS, raising more than $525 million to support programs in 55 countries.

Dear Reg,

From the moment you heard Elvis Presley, you've known that music would be your life. At 18 years old, you can't imagine that in a few short years, your own music will take you to places beyond your wildest dreams. Right now, you're struggling to fit in and act the way others expect you. It will be a long journey, but one day you will realize that only by being yourself can you find your true voice.

I'm here to give you some advice that will make your life immeasurably richer on this journey. ***Build bridges, not walls.*** *You will go on to play to billions of fans in your career (yes, billions), and have the joy of meeting many thousands of them. You will quickly learn that most people—gay, straight, Black, White, rich or poor—all want the same basic things in life: to be safe, respected, loved and free.*

By opening a dialogue with those who think differently to you, you will be able to open hearts and minds—and turn the tide on an epidemic that will affect you greatly later in life: AIDS. It doesn't exist yet, but you will be so profoundly moved that you will start the Elton John AIDS Foundation based on your lifelong belief that everyone deserves the right to a healthy life, no matter who they love.

But it won't be easy. This world is unequal and can be quick to judge. You will be in the privileged position to help change this for many people. That's why you will be compelled to give so much to others through your foundation, and the impact will give you so much in return. And yes, you will find love, fulfillment and even your own family. It's all to come. Treasure it.

Love,
Elton (yes, that's your name!)

Esther Rantzen

The 82-year-old TV presenter and producer has been a staple of British screens for more than five decades. She parlayed that fame into founding two charities: Childline, providing support to any child in need, and the Silver Line, which offers a listening ear to the elderly. Almost 3 million calls have been made to the Silver Line since 2012, and Childline has delivered 5.7 million free counseling sessions since it began in 1986.

Dear 18-year-old Esther,

Bearing in mind that you will probably spend longer at work than anywhere else, my advice is that you focus on what you really want out of it. If you want money, good luck: I have no idea how you achieve that, or if it's worth it when you get it. I've never noticed how much happier the rich are, or their families.

Personally, I recommend prioritizing fun and achievement.

Fun, first of all. You may find (I certainly did) that your first jobs aren't that much fun. I started out learning shorthand and typing. It was grueling, but no experience is ever wasted—being able to touch-type at speed has been really useful. My early job in television was to file 23,000 photographs, which was even more boring but also useful, because it taught me that the wrong job is so frustrating that you really appreciate the right job when it comes along.

The sense of achievement is just as important as the fun. You need to feel at the end of the day that being there, doing that, was worthwhile. *I have been incredibly lucky to have been in the right place at the right time to be able to use television to launch two charities: Childline, a helpline for children, and the Silver Line Helpline, a phone line for isolated and vulnerable older people who have nobody else to talk to, to share a joke or a memory with. The knowledge that they are transforming lives for the better is immensely rewarding. At the end of each conversation, you know you have made a difference.*

I remember how the ideas for both helplines came to me. In each case it was like a physical lightbulb going on over my head. My advice is, to anyone, if that happens to you, ignore it—because if you don't, it will take over your life. That is certainly what has happened to me, as I am still passionately committed to both charities. Even now my days are dominated by the work I do for them, but I wouldn't have it any other way.

I feel privileged, and I am.
Esther

ILLUSTRATIONS BY ULI KNÖRZER

Billy Shore

In 1984, Shore, now 67, co-founded with his sister the anti-hunger organization Share Our Strength, which has raised more than $1 billion to fight hunger and poverty in the US. Its "No Kid Hungry" campaign helped reduce childhood hunger to the lowest level in recent history. Since the start of the pandemic, it has given out more than $125 million in grants, and its partners have served over 1 billion meals to children.

Dear Billy,

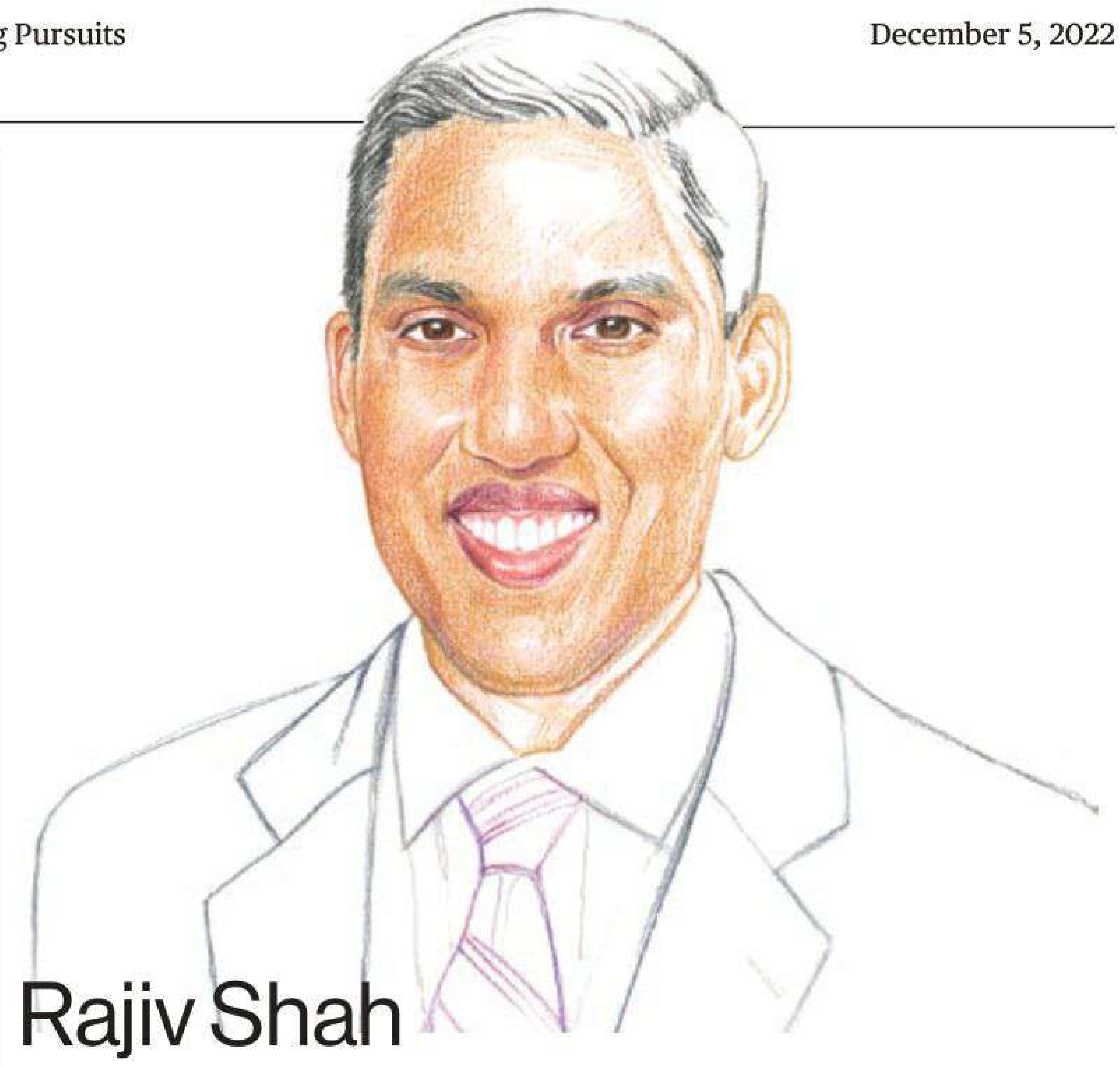
I have three pieces of advice about making a difference in the world:

First, heed the words of the writer, educator and activist Jonathan Kozol and pick battles big enough to matter but small enough to win. Social change is hard, and it takes victories to sustain us and motivate others. This led Share Our Strength to focus on ending childhood hunger in the US. It's one of our most solvable problems.

Second, commit to a lifetime of bearing witness: Go into communities you don't know to see what you haven't yet seen and feel what you haven't felt. Bearing witness makes us complicit. Whether serving food to refugees on the border in the Rio Grande Valley or trying to get school meals to hungry kids in New York, I've learned that ***what we see can't be unseen—and we are left with a profound choice: do something or do nothing.***

Third, embrace the philosophy of the world's great cathedral builders whose inspiring masterpieces often took hundreds of years to build. Everyone who worked on them knew one thing for certain: They would not see their work finished in their lifetime. This didn't detract from their craftsmanship and/or commitment. It enhanced it. They knew that they were contributing to something larger than themselves. Some of our social challenges, such as eradicating poverty, injustice and inequity, may take generations to solve. But even if we don't succeed in our lifetime, we can do our part to lay a few more bricks in the glorious cathedral.

Billy



Rajiv Shah

The 49-year-old became president of the Rockefeller Foundation in 2017, after serving as head of the USAID program under President Barack Obama; he's also worked for the Bill & Melinda Gates Foundation. The Rockefeller Foundation, with assets of more than $7.7 billion, backs research in science, data, policy and innovation to improve the well-being of humanity.

Dear 18-year-old Rajiv,

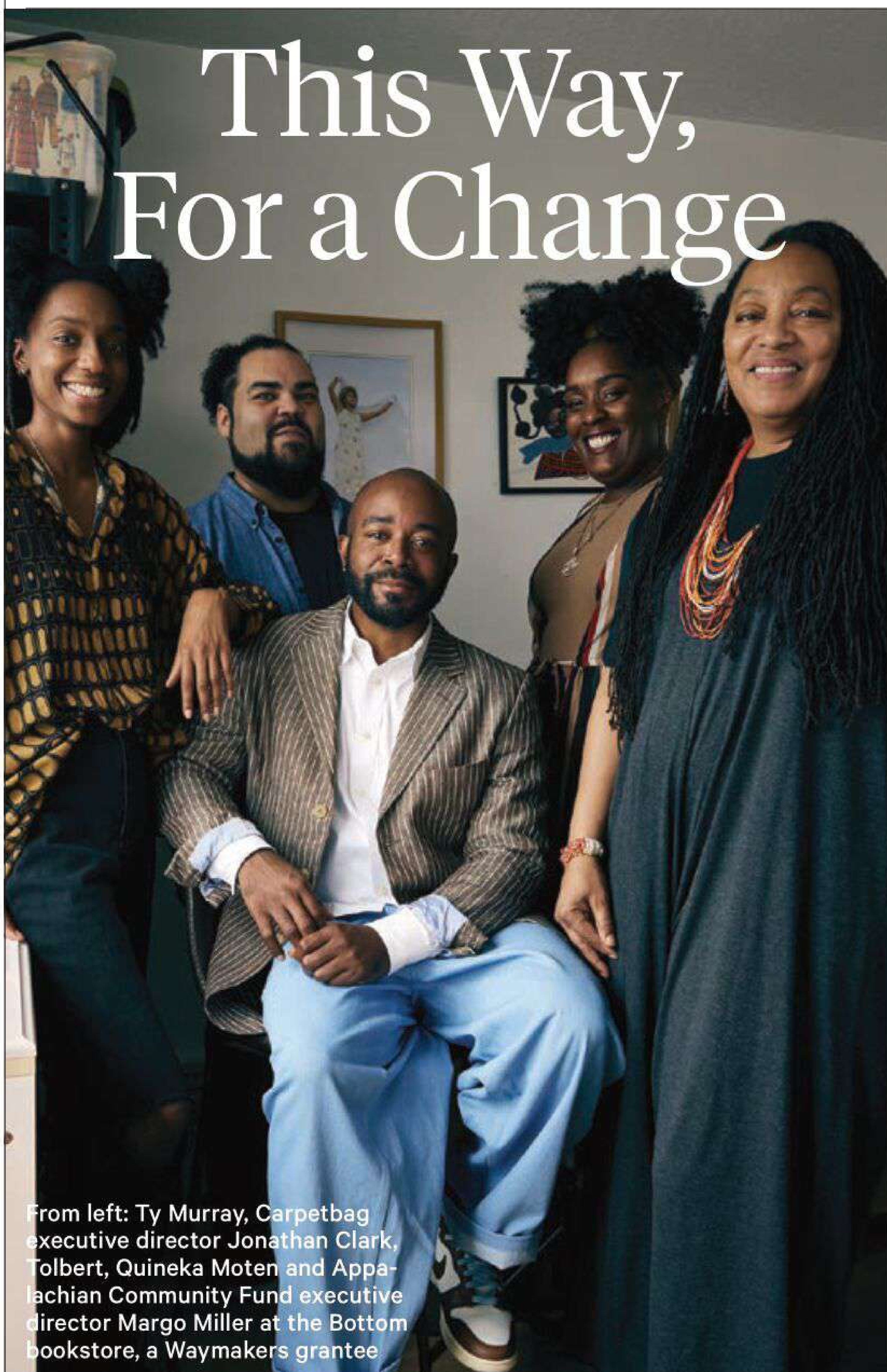
Big, transformative change is possible.

You have just watched, transfixed, as Nelson Mandela, a few months after his release from prison, visited your hometown of Detroit. With unique dignity and determination, Mandela used trips like the one to "Motor Town," as he endearingly called it, to transform the wider world by inspiring millions to join his fight for justice. You're now one of them, desperate to do something meaningful with your own life. But still, I know you are worried about how—and about whether—someone like you is capable of making big change.

What you don't know yet is that in the years to come, you will be a part of bold alliances, including with the Rockefeller Foundation, to vaccinate nearly a billion children, respond to deadly outbreaks at home and abroad, and provide electricity to hundreds of millions of people around the world. Along the way, you will learn that you do not need to settle for incremental progress, and you do not need to be someone of singular character and conviction like Mandela—or even someone with an enormous platform.

You simply need to believe it is possible to galvanize the alliances required to scale the transformative solutions humanity needs in the 21st century. *The good news is, despite what you might hear, people want to make big change. People, whether they are in Detroit, Dakar, New Delhi or Santo Domingo, seek purpose and meaning in their lives and work. And with big ambition and compelling vision, it is possible to stir their souls and convince them to join efforts to make big change. What you need is to believe that big bets for humanity can pay off.*

Rajiv



This Way, For a Change

From left: Ty Murray, Carpetbag executive director Jonathan Clark, Tolbert, Quineka Moten and Appalachian Community Fund executive director Margo Miller at the Bottom bookstore, a Waymakers grantee

Instead of traditional models of giving, Appalachia's Waymakers Collective is forging a community-led approach. *By Ariel Felton*

Joe Tolbert Jr. is a proud native of Knoxville, Tennessee. But growing up, he never really considered himself Appalachian. "You didn't see Black folks reflected in the larger narrative of who Appalachia was and what the region was said to be," he says. "I didn't see myself. I didn't see how I fit."

As a teenager, Tolbert began participating in the Theater Renaissance for Youth Ensemble, hosted by Carpetbag Theatre, a local acting company that combines performance and storytelling with an eye toward social change. It challenged him to explore what home meant to him.

"At that time, my family had just experienced a tragedy with a loved one being killed by a cop, and it was pressing on my mind," Tolbert says. "It brought home the things that I had seen on the news elsewhere. I was 15 when it happened, and of course I didn't have the emotional maturity to handle the grief."

Eventually, Tolbert met Elandria Williams, an educator and organizer at Highlander Research and Education Center, a leadership training school in New Market, Tennessee. During his time there, he said that he "wasn't Appalachian."

"Elandria told me to walk up to a map that was in the library and point to where Knoxville was," Tolbert says of his late teacher. "Of course I do that, and it's right in the middle of the Appalachian Mountains."

Today, Tolbert serves as program director of Waymakers Collective, a nontraditional funding collaborative on course to

TOLBERT: PHOTOGRAPH BY JOSEPH ROSS FOR BLOOMBERG BUSINESSWEEK. RIX: PHOTOGRAPH BY DIANA KING FOR BLOOMBERG PURSUITS. AGGREY: PHOTOGRAPH BY CARLOS ÁLVAREZ-MONTERO FOR BLOOMBERG PURSUITS. EASTSIDE: PHOTOGRAPH BY SYDNEY A. FOSTER FOR BLOOMBERG PURSUITS

The Faces of Industry Shakers

Phillip Ashley Chocolates
Phillip Ashley Rix started out by selling his chocolates from the trunk of his car in Memphis in 2012. In June he was named the exclusive chocolatier of Cadillac, creating confections for luxury car launches. The Phillip Ashley brand has built its success on unorthodox flavors such as black truffle, fig and toasted sweet potatoes. Rix's unconventional approach earned him the moniker "Willy Wonka," but his creativity shows up in entrepreneurial ways, too. After achieving some early success with his chocolates at pop-ups and charity events, he started calling on corporate clients. "Some of the first companies I targeted were insurance companies," he says. "Because I knew they had huge customer databases and they're always looking for ways to get new clients and maintain policyholders."

distribute a one-time gift of $4.5 million to overlooked artists, cultural workers and nonprofits across an area spanning six states from southeastern Ohio to western North Carolina. Since 2020, it's given 138 grants totaling more than $950,000.

The collective was born out of Local Control, Local Fields, an initiative begun in 2019 by ArtPlace America, a partnership among foundations, federal agencies and financial institutions that was created to use arts and culture as a way to build stronger communities. ArtPlace supplied the $4.5 million total for Waymakers.

Tolbert, along with 40 other nonprofit leaders and cultural workers across Appalachia, decided to focus on shifting power imbalances in the world of philanthropy. The result is a participatory grantmaking model that puts decision-making in the hands of community members instead of a sole authority who likely knows little about the region.

"Traditionally, grant strategies are decided by the funder," Tolbert says. "They decide, 'We want to give to this type of organization.' They do an open call, have people review applications, and it's very merit-based. It breeds competition, and it's rooted in some of the same characteristics of capitalism. We knew that we didn't want to do that."

Instead, voting members of the Waymakers Collective must be current residents or engaged in work in the area. Those members recommend artists and organizations to receive funds, then those entities are asked to submit a short proposal to the voting assembly. Once awards are given and the gifting period is over, those recipients can then elect to join the collective for the next round. "Nobody knows the community like the people living in it," says Tolbert.

Recipients include organizations such as the Hemphill Community Center in Jackhorn, Kentucky, which hosts workshops on mountain traditions like quiltmaking; the Mount Zion Baptist Church Preservation Society in Athens, Ohio, which maintains an historical place of worship; the Bottom, a bookstore, tea room and podcast studio in Knoxville; and Qualla Arts & Crafts, the nation's oldest American Indian cooperative, in Cherokee, North Carolina.

Waymakers also supports individual artists. Among the first of those grantees were Tiffany Pyette, an Indigenous community organizer, writer and activist in eastern Kentucky whose textile work celebrates traditional materials and dyeing methods; and Geonovah, an up-and-coming rapper from Big Stone Gap, Virginia, who uses music to discuss mass incarceration and police brutality.

The collective's next priority is growing sustainably in the midst of fundraising challenges. "If we grow too fast, we exhaust the resource," says Tolbert.

To that end, the Waymakers Collective has invested $1.3 million of the original sum in the Federation of Appalachian Housing Enterprises, an affordable-housing community development financial institution serving the region, and Oweesta, the country's longest-standing American Indian CDFI. Tolbert says the expected 3% return is less about making a profit and more for "preserving our capital and supporting CDFIs that further develop infrastructure in our region."

For Tolbert, giving back is the reward. It was through telling his story as a teenager that he learned of "the dual power of the arts." It isn't just for personal and communal healing, he says, but also for "the political implications of telling our stories that have often been silenced by the dominant culture and the institutions it creates."

As part of the first assembly on the transition team in 2019, Tolbert returned the favor to the site of his seminal teenage experience, and his inaugural nomination led to a $10,000 award for Carpetbag Theatre.

A new Pursuits series highlights entrepreneurs of color making important changes in their fields. For the full versions of these stories and more, see bloombergpursuits.com.

Xula

Mennlay Golokeh Aggrey is part of a generation that's seen marijuana transform from a target of the war on drugs to the darling of venture capital firms. Aggrey, who was born in the US to parents who'd immigrated from West Africa, lives in Mexico City. There, with cannabis researcher and advocate Karina Primelles, she runs Xula, a cannabinoid brand whose products address a range of health issues. Its focus on the needs of women makes it stand out: One of its products, Happy Period, targets cramps, backaches and digestive issues with 500 milligrams of CBD. Another, Happy Hormones, bolsters mood with a stronger dose. "Our products are centered on people with wombs," Aggrey says, which in the cannabis world is an "extremely underserved" market.

Eastside

The style of professional golfers follows certain old-fashioned country club codes: Think Arnold Palmer's pink cardigan or Tiger Woods's red polo. Eastside Golf, helmed by Earl Cooper (at left) and Olajuwon Ajanaku (right), is beginning to change that. The two met as teammates on the golf club at Morehouse College, an historically Black men's liberal arts school in Atlanta. After a brief stint in finance, Ajanaku reconnected with Cooper on the idea for an apparel brand that could be worn on or off the links. The logo is a cartoon version of Ajanaku in jeans and a sweatshirt with a gold chain, while Eastside's polos, hats, sweatshirts, visors and head covers use a striking cursive script that evokes graffiti more than the interior of a country club.

High-Ranking Whiskey

Give back to those who've bravely served by imbibing some of the strong stuff. *By Brad Japhe*

There are many ways to get into the world of whiskey-making. Some people, like Buffalo Trace Distillery's Harlen Wheatley, come from backgrounds in chemical engineering. Rob Dietrich of Sweet Amber was a rock 'n' roll roadie.

For Scott Neil, the path cut through the mountains of Afghanistan. As part of Special Forces Team ODA 595, the Green Beret helped overthrow a Taliban stronghold in the immediate aftermath of the Sept. 11 attacks. The unit daringly navigated the rugged terrain on horseback, earning the nickname "Horse Soldiers."

When Neil decided to introduce a bourbon brand 13 years later as a way to help support veteran causes, he knew exactly what to call it. He recruited his band of brothers to help him build it, enlisting in his new mission those who have been involved in every major conflict since the Vietnam War.

Their legacy is raising hundreds of thousands for charities, primarily through the annual commemorative release of an ultrapremium whiskey called Commanders Select. A set of three bottles has gone for as much as $75,000 at live auction. The brand also puts on a series of "Whiskey & War Stories" dinners that are hosted by actual Horse Soldiers. A portion of sales from all releases is donated to the upkeep of the America's Response Monument in Lower Manhattan.

Veteran-owned booze operations benefiting men and women in uniform might seem remarkably niche. Over the past five years, however, they've become a bit of a trend. In 2017, Old Line Spirits fired up its stills in Baltimore. Although founders Mark McLaughlin and Arch Watkins met in the Navy as opposed to the Army origins of Horse Soldier, and Old Line specializes in American single malt as opposed to bourbon, their respective operations align.

Old Line's most noteworthy partnership, according to McLaughlin, is with Fisher House Foundation Inc., which offers free housing to family members of ill or wounded service members as they undergo medical treatment. Each November and December the brand sets up in-store displays at retail accounts, from which $5 per bottle is donated to the foundation. "This is a program that we will continue to grow into new markets as we expand as a company," McLaughlin says.

In the meantime, Old Line leans local by supporting the Baltimore Station, an organization that provides housing, counseling and job training to homeless veterans across the city. For Veterans Day, the distillery hosted a large bottle raffle event to raise money for the group. McLaughlin says it's only a start: "We're looking forward to building on these events every year to make them an annual way for Old Line and the local community to help out veterans in need."

Whiskey brand Regimental Spirits works its military bona fides into packaging design. Conceived by infantrymen Eric DiNoto and Kyle Moore while on the deserted rooftop of the Ba'ath Party headquarters in Baghdad, it brandishes its liquid in canteen-shaped bottles. The co-founders often raise funds for Fisher House of Boston.

Swelling demand would indicate that consumers are heartened by the philanthropic nature of these operations. Horse Soldier, which maintains a popular tasting room and restaurant in St. Petersburg, Florida, has broken ground on a massive $200 million home base in Somerset, Kentucky. In August the giant E. & J. Gallo Winery invested an undisclosed sum in the project. B

The Best Three We've Tried

Horse Soldier Small Batch
The brand's gold label flagship (at left) is a 95-proof, honey-hued sipper advancing hints of apricot and gingerbread toward the nose. As a wheated bourbon, it's got a creamier mouthfeel, less sharp than rye. These softer textures elongate a sustained finish that brims with delicious butterscotch. *$70*

Old Line American Single Malt Whiskey Cask Strength
Assertive on the nose and tongue, this 120-proof liquid pours out of the bottle with pleasant, recognizable notes of maple syrup and s'mores. Beneath the sweetness is a layer of wood smoke that cedes to cinnamon and dark fudge in the finish. It's surprisingly complex for a whiskey with less than two years of maturation. *$55*

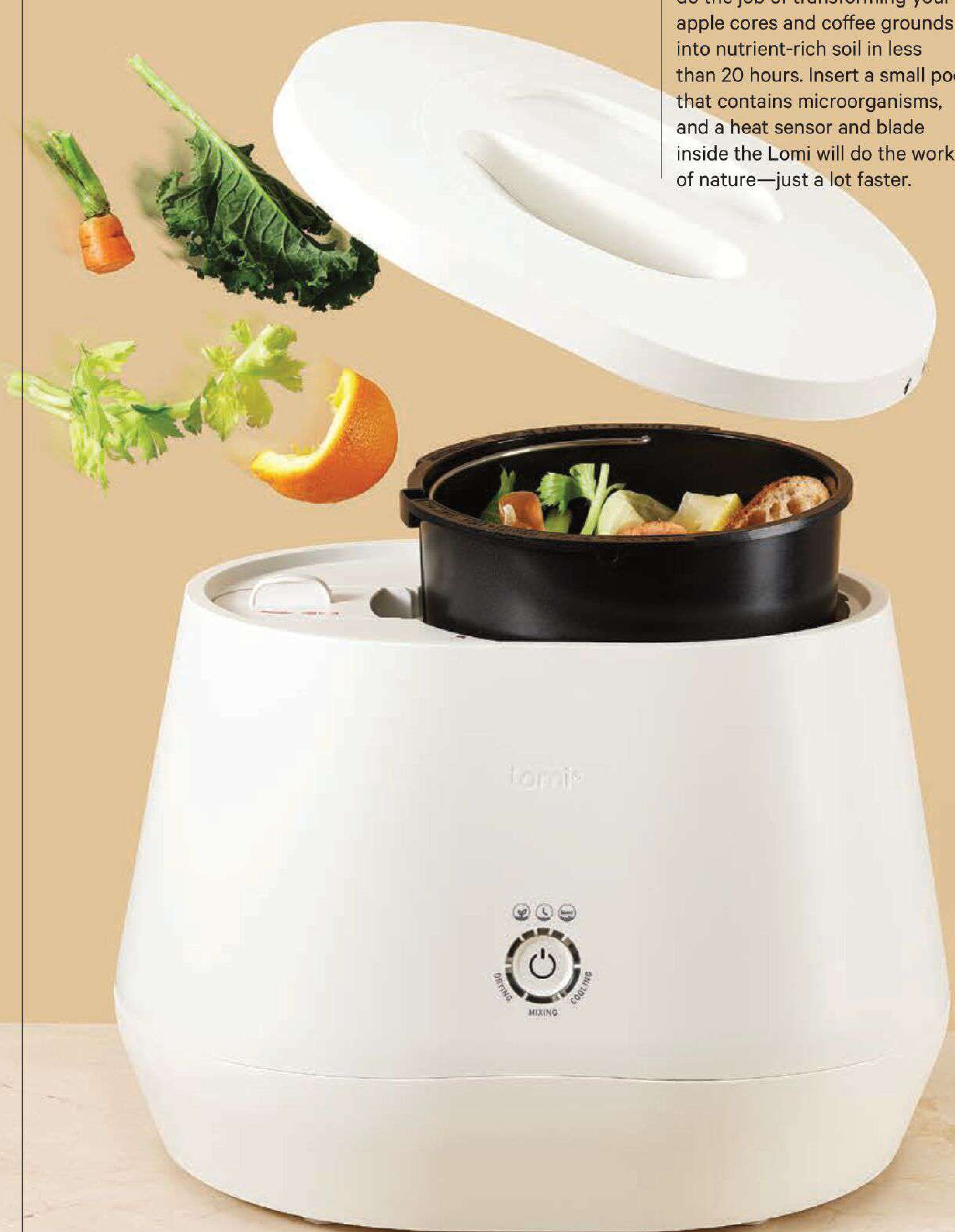
Regimental Spirits Kentucky Bourbon
This easy-drinking option will appeal to fans of lighter whiskeys. It's very high in corn, imparting an initial sweetness not unlike caramel candy. A distant echo of vanilla tickles the back of the tongue but fades fast in the finish. *$35*

COURTESY HORSE SOLDIER

Soil Provider

The Lomi makes composting fast, fun, and, most important, stench-free. *By James Gaddy*

Photograph by Takamasa Ota



It takes a year, according to experts in organic fertilizer, for food scraps to fully break down into usable compost. The process can be sped up by adding organisms both micro (bacteria, fungi) and macro (earthworms, insects), and yet even then it can be a six- to eight-week process. But the $499 Lomi, which at 16 inches wide and 12 inches tall has a relatively compact footprint, can do the job of transforming your apple cores and coffee grounds into nutrient-rich soil in less than 20 hours. Insert a small pod that contains microorganisms, and a heat sensor and blade inside the Lomi will do the work of nature—just a lot faster.

THE COMPETITION

• If you want to create compost the time-honored (and time-intensive) way, stainless-steel garbage can manufacturer Simplehuman offers a minimalist 4-liter, $50 compost caddy that comes with a convenient magnetic docking bracket that can attach to the brand's trash receptacles.

• For outdoor spaces, the $1,000 Jora Compost Tumbler 400 can hold as much as 106 gallons and, because it's insulated, reach 160F. This higher temperature results in fast, efficient and more thorough composting.

• A potentially more fun and kid-friendly way to get the family involved is the $110 5-Tray VermiHut Plus worm compost bin. Fill a tray with worm bedding, food scraps and, of course, worms, and they'll eat up your leftovers and leave behind highly nutritious organic material. Worms sold separately.

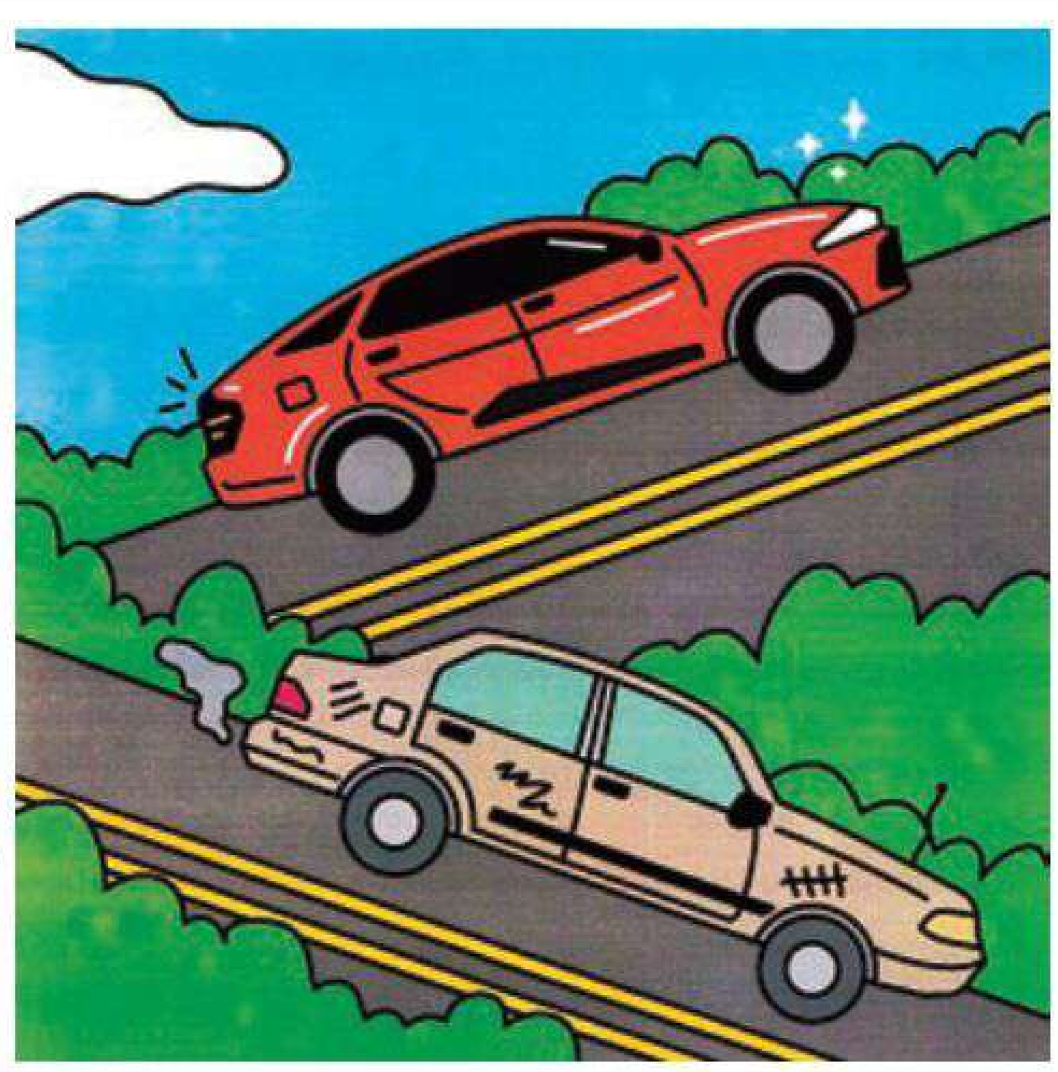
THE CASE

For all the good that composting does for the environment, the act of maintaining a bin indoors—at least in the past—meant living with fruit flies and odors of rotting food. But the Lomi is equipped with a dual-activated carbon filtration system, which eliminates funky smells and traps harmful gases. It holds 3 liters at a time, and in our tests the bucket for scraps would fill up after about three days of morning coffee and home-cooked meals. At 20 pounds, the Lomi isn't quite a countertop device, and the heat emitted means it'll ideally occupy a mud room or outdoor terrace. But time saved makes this composting contraption a game changer. Watching waste that would have gone to a landfill mixed, hours later, into garden plots feels almost like magic. *$499; lomi.com*

A Sign of Inflation Coming Down the Road

By Lisa Abramowicz

To understand why it's so hard to get a handle on inflation, take a look at car prices in the US today. Used-vehicle prices are dropping at the fastest pace in decades, and the cost of a new car is still skyrocketing. How can this be?



The simplest explanation is that used-car prices went bonkers last year because there was so little inventory and there's now a long way to fall. The more disturbing reason is the classic story of two Americas: Wealthier families have a lot of money saved, and they're willing to pay a premium to get a bigger, fancier new car. Over the past 18 months, almost every new vehicle was either presold or sold at full sticker price within a week of delivery, according to Cox Automotive.

On the flip side, used-car prices have dropped by almost 16% from their peak in January, Pantheon Macroeconomics data show. This comes as less-wealthy families have used up cash buffers established during the pandemic. Not only are many more limited in their absolute cash levels, but they have fewer options to buy on credit, with average interest rates on used-car loans surging to almost 12%, compared with 7.6% on new-car loans, Cox data show. This dynamic may persist, with JPMorgan Chase & Co. predicting a plunge of up to 20% in used-car prices next year, compared with a maximum 5% dip in new-vehicle prices.

This pocket of disinflation has caused some notable victims. Carvana Co. is the most obvious, with the online dealer having lost most of its value this year and opting to cut thousands of jobs. Hertz Global Holdings Inc. is another, with its shares taking a hit after the company reported lower resale values of its rental-car fleets. But they're anecdotes in the face of an otherwise resilient consumer.

As the US tries to tamp down the fastest pace of inflation in four decades, economists are scouring key inputs to understand how quickly prices can stabilize. Car costs are an important input to basic inflation metrics, accounting for about 11% of the core consumer price index data, which the Federal Reserve considers when deciding on monetary policy. Falling used-vehicle values are a great development for those who want more price stability. But rising new-auto prices cloud the picture, maintaining pressure on the Fed to keep hiking benchmark rates even as the lowest-income families feel growing pressure and pain. Complicating the backdrop further: Supply-chain disruptions have, until recently, limited the number of new cars available and likely will reduce the amount available to used-car dealers in coming years. Not only that, but businesses are producing fewer and more-expensive vehicles, so there's likely more price pressure ahead. "Inflation in the used-vehicle market will be back shortly," says Bloomberg Intelligence's Kevin Tynan.

As the wealthiest keep spending from their ample cash piles, lower-income households are going to be battered on both sides, with falling disposable income and fewer opportunities in an economy on a rocky path. Ⓑ

ILLUSTRATION BY GEORGE WYLESOL

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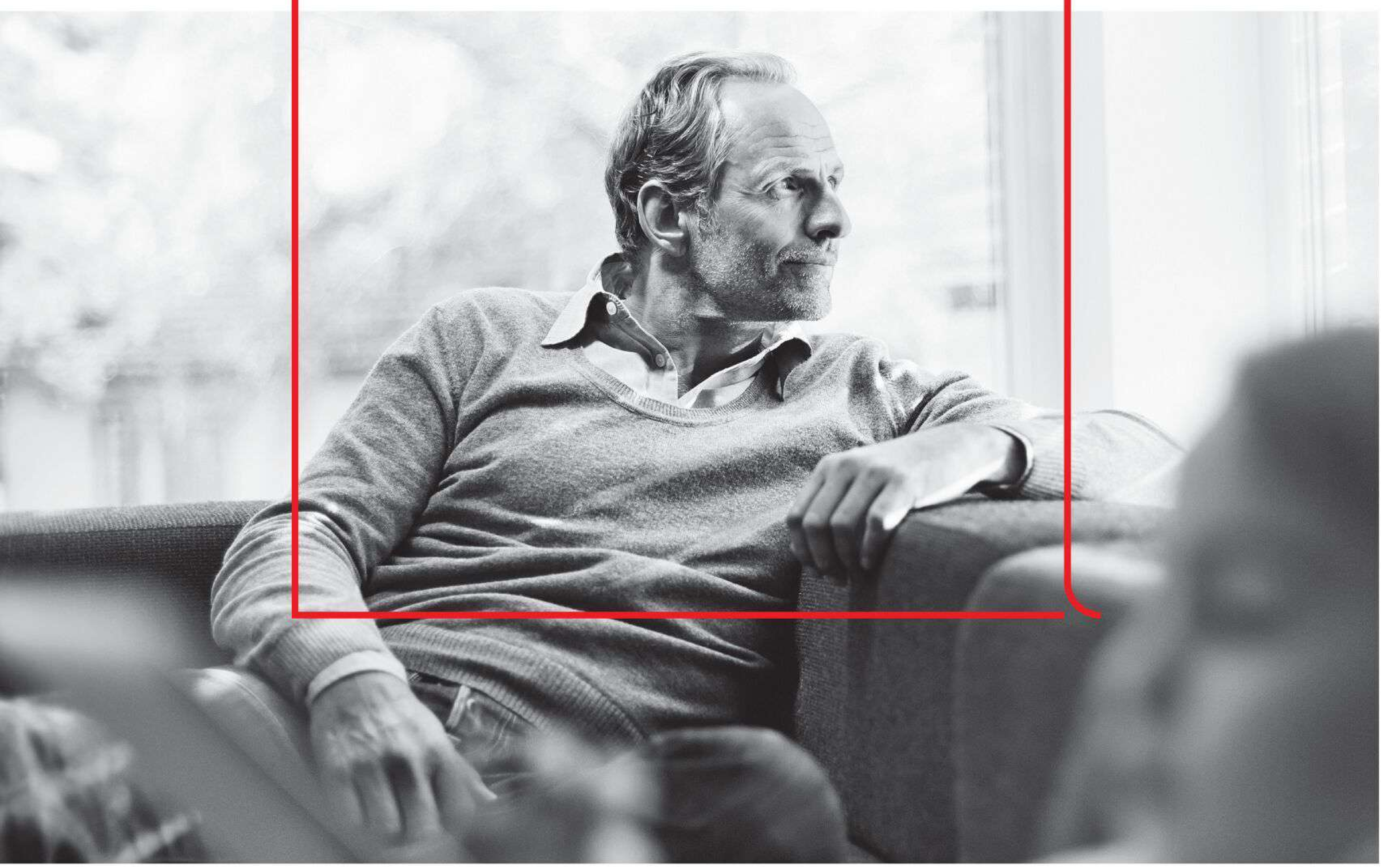


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