# Bloomberg Businessweek

October 10, 2022


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# Am I ready for a constantly changing world?

Does my strategy embrace it?
And my portfolio reflect it?

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## ■ COVER TRAIL

How the cover gets made

❶

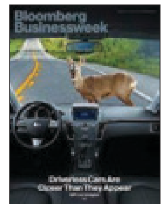
"This week's story is all about driverless cars!"

"We're so close—I can't wait!!"

"Patience, friend. Turns out there are…issues."

"OK. I have the perfect idea—a driverless car on a road about to hit a deer."

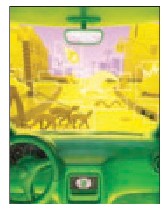
"Been there."




❷

"More urban, then. Thinking car, dogs, a trash can or two?"

"Done that."

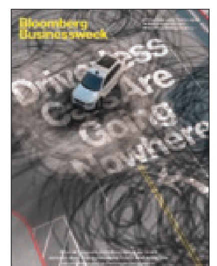


❸

"Wow. It truly is like we've been working on this for years and haven't gone anywhere."

"Yep!"

"I've got the perfect cover."

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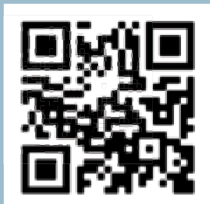

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# IN BRIEF



By Benedikt Kammel

● Globally, over 620 million people have had Covid-19, and almost

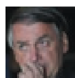
**6.6m**

have died. While nearly 12.8 billion vaccine doses have been given, progress on boosters has been slow. In the US, only 2.7% of the eligible population—which is anyone 12 years and older—has received the new shot formulated to fight omicron.

● Liz Truss had to make a U-turn on a significant part of her economic plan: abolishing the UK's 45% top income tax rate.

The prime minister's reversal came after the pound slumped, leading the Bank of England to intervene to calm markets.

● Russian shells hit a convoy of Ukrainian civilians on the road to Svatove, in Luhansk, killing 20. Ukraine is rapidly retaking territory there and in the other three provinces—Donetsk, Kherson, and Zaporizhzhia—that Russia illegally annexed.

● Brazilian President Jair  Bolsonaro will face former President Luiz Inácio Lula da Silva in a runoff election on Oct. 30.

Lula, who led in the polls by a wide margin, fell just short of scoring an outright win in the first round on Oct. 2.

● Divya Nettimi broke new ground in a male-dominated market on Oct. 3 by starting her own hedge fund with commitments of more than

**$1b**

The sum makes Avala Global the largest fund ever launched by a woman and among the biggest of any to debut this year.

● Ray Dalio has given up control of Bridgewater Associates. The billionaire founder of the world's largest hedge fund is entrusting its $150 billion in assets to a younger generation. On Sept. 30 he transferred all of his voting rights to the board of directors and stepped down as one of three co-chief investment officers.

● OPEC and its allies agreed to their biggest output cut since 2020.

The move poses another threat to the world's economy. The White House slammed the decision and indicated that it would respond to the supply reduction.



● "The entire point of the amendment was to secure rights of the freed former slaves."

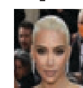
On Oct. 4, Supreme Court Associate Justice Ketanji Brown Jackson, days after being sworn in, expressed dismay at the Alabama solicitor general's contention that the Voting Rights Act violates the equal protection clause of the 14th Amendment. The case, *Merrill v. Milligan*, touches on why Black voters, who make up a third of the state's electorate, control only one of its seven congressional districts.

● Burkina Faso's military ruler, Paul-Henri Damiba, offered to resign on Oct. 3, days after his government was overthrown in a coup.

It's the second time in eight months that the West African nation, which has struggled to control Islamic militias and other rebel groups, has experienced a military coup.

● Kim Kardashian will pay

**$1.26m**



to settle allegations she broke US rules by touting a crypto token without disclosing she'd been paid to do so. According to the SEC, the reality-TV star was paid $250,000 to post about crypto asset EMAX on her Instagram account. Kardashian neither admitted nor denied wrongdoing.

UKRAINE: REUTERS. BOLSONARO: ERALDO PERES/AP PHOTO. LULA: ANDRE PENNER/AP PHOTO. DALIO: TAKAAKI IWABU/BLOOMBERG. BROWN: J. SCOTT APPLEWHITE/AP PHOTO. KARDASHIAN: EVAN AGOSTINI/INVISION/AP PHOTO

# UK Pension Funds Shouldn't Create So Much Excitement

Pension funds are supposed to be among the least exciting financial institutions. Their job is to make long-term investments to meet the predictable needs of future retirees. They should be immune to short-term shocks. Yet in the UK, they were recently the center of an incipient financial crisis.

What led to this was a novel variation on a well-known theme: Leverage meets unforeseen events. The danger when these two collide isn't confined to any one country or market, so regulators everywhere ought to take note. Banks are somewhat safer than they were before the crash of 2008, but risks that start outside the traditional financial system still require greater attention.

The UK pension funds' embarrassment (page 24) shows how subtle those risks can be. The funds used derivatives, so they believed, to hedge their positions—that is, to make their portfolios safer. Using a technique called "liability-driven investing," they guarded against the risk that lower interest rates would increase their liabilities (the present value of future pension payments) more than they boosted their assets (government bonds, stocks, and other investments). They did this, in effect, by borrowing to increase their exposure to government bonds.

Unfortunately, reducing the risk from lower interest rates failed to take account of the possibility that rates might abruptly and dramatically rise—which is what happened after the UK government announced a reckless new fiscal policy on Sept. 23. Higher rates (lower bond prices) reduced the pension funds' long-term liabilities but also caused the funds' derivative counterparties to demand more collateral upfront. This meant selling bonds, pushing their prices still lower, which called for more collateral, and so on.

The Bank of England interrupted this downward spiral by promising to buy bonds at "whatever scale is necessary" to restore orderly markets. It's too soon to say how the story ends. The debacle has made investors everywhere more anxious, and the intervention of the central bank, to put it mildly, complicates its efforts to tighten monetary policy and curb inflation.

For regulators, the lesson is this: The details of the breakdown are new, but the central dynamic isn't. Just about every case of financial contagion and crisis, from the 2008 mortgage meltdown to last year's implosion of Archegos Capital Management, shares the same basic features. The more leverage held by nonbanks such as pension funds, hedge funds, and insurers, the greater the chance that dislocations will proliferate and threaten the broader system. Regulators limit bank leverage by imposing capital requirements. In so-called shadow banking, this role falls largely to the counterparties. In good times they often set collateral requirements too low, leading to huge calls for additional collateral in bad times, when markets are most stressed and least able to deliver it.

Back in 2018, the Bank of England was aware that margin calls would hit pension funds when interest rates went up, yet it concluded all was well. Its worst-case scenario envisaged interest rates rising 100 basis points. At the time, that seemed a lot. Already moving up, they spiked more than that in the space of a few days—and would have gone up much more if the bank hadn't stepped in.

Regulators need to remember that low-probability events aren't zero-probability events: Eventually they happen, and when they do, the damage can be huge. Across the ever-widening landscape of finance, they need to examine leverage in all forms more closely—and set margin requirements and rules that reflect how much markets can move when things go wrong. If regulators do their job, pension funds will be boring again. Ⓑ *For more commentary, go to bloomberg.com/opinion*

## ■ AGENDA

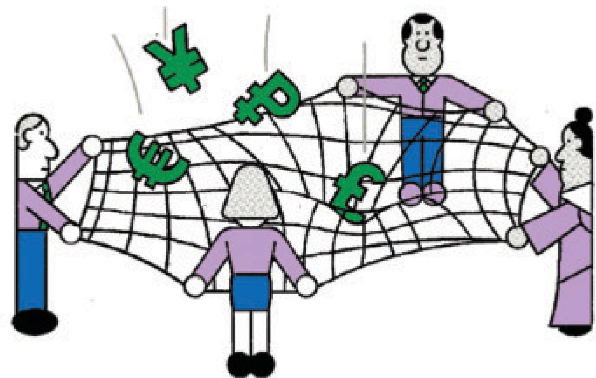


ILLUSTRATION BY JAY DANIEL WRIGHT

### ► The Impossible Mission Force

As the International Monetary Fund starts its annual meeting on Oct. 10 in Washington, it faces a daunting task: how to support a world economy that's showing signs of a rapid downshift, making a recession increasingly likely.

► The Swedish Riksbank announces its annual Nobel Prize in economic sciences on Oct. 10. Last year three US-based academics shared the 10 million-kronor ($921,000) prize.

► NATO defense ministers meet Oct. 12-13 in Brussels. Ukraine, where tension is rising after Russia vowed to defend the provinces it illegally annexed, tops the agenda.

► Facebook parent Meta holds an event on Oct. 11 to explore the future of virtual reality. Mark Zuckerberg will need to build buzz for a vision that's failed to excite investors or users.

► JPMorgan, Morgan Stanley, and Wells Fargo report third-quarter earnings on Oct. 14. Twitchy markets probably lifted trading revenue and hurt investment banking.

► Australia ends its mandatory Covid-19 isolation requirements on Oct. 14. The country had some of the world's strictest lockdown restrictions at the height of the pandemic.

► The US Supreme Court on Oct. 12 will hear an appeal of a ruling that Andy Warhol violated Lynn Goldsmith's copyright when he used her photos in illustrations of the musician Prince.

# Twitter's Turn

PHOTO ILLUSTRATION BY JUSTIN METZ; PHOTOS: SHUTTERSTOCK (5)

# ● With a lawsuit looming, Elon Musk decides to go through with his Twitter purchase—for now at least

● By Sarah Frier

Months of legal barbs exchanged between Twitter Inc. and Elon Musk—who urgently wanted to own the company and then changed his mind—came to a head on Monday, Oct. 3, with an apparent peace offering. The world's richest man said in a letter to Twitter's board that he would buy the social network after all. He plans to honor the original $44 billion price tag he agreed to in April, plus everything else in that contract.

Twitter shares jumped more than 20% the next day, indicating investors expect a done deal. But Twitter stopped short of declaring victory or dropping the suit it filed to force Musk to complete the transaction, which is set to go to trial on Oct. 17.

Twitter has good reason to be cautious. While Musk has secured the financing for the deal—from banks that may be regretting the commitments they made during better economic times—he hasn't earned any trust with Twitter. The company would be wise to get the money before closing its legal shop. Back in April, Musk was on friendly terms with Twitter and ready to join its board. The company had prematurely put his face on its investor relations page and invited him to do a question-and-answer session with employees. But he reneged the same week, apparently frustrated after Chief Executive Officer Parag Agrawal told Musk that his negative public commentary was making it hard for employees to focus, according to text messages released by the court. "What did you get done this week?" Musk replied to Agrawal. "I'm not joining the board. This is a waste of time. Will make an offer to take Twitter private."

Musk then proposed to buy the company with a take-it-or-leave-it letter, offering terms friendly to Twitter without waiting for due diligence. Mere weeks after Twitter accepted, Musk worked to unwind the commitment, mocked management, and questioned the network's user numbers. So Twitter sued. For months, Musk piled new arguments into his countersuit, doubling down on his claim of a high proportion of bot users that degraded the company's value and saying Twitter wasn't providing enough information for the deal to go forward.

His surprise return to the original deal terms came with a provision that the Delaware Chancery court "enter an immediate stay" of Twitter's suit "and adjourn the trial and all other proceedings related" to the case. The provision hints at what might have sparked Musk's change of heart: His closest contacts are being deposed, and their private messages with him are becoming public via the court. Musk's own deposition, which could unearth other private conversations, was scheduled for Thursday. There was also the matter of the string of pretrial rulings that weren't going Musk's way, giving his lawyers a sign that he'd face difficulties in court.

Still, the word "immediate" in the Oct. 3 letter to Twitter's board gives Musk cover to cancel the new (old) offer if he wants to. He also is reserving his right to sue if Twitter doesn't comply with the terms of the original merger agreement—which many of his filings allege Twitter has violated. Even if that's legal boilerplate, it leaves room for skepticism about whether this is the end of the story; there's still enough contention between the two parties that no joint statement surfaced the following day.

There's risk with any litigation, and Twitter might accept Musk's offer to eliminate the chance of losing in court, says Peter Ladig, a director at the law firm Bayard. "The most cynical view would be that Musk is trying to make a strong play publicly to get Twitter to agree to a stay, after which he will nonetheless not go through with it or find some new excuse, and then we'll be back to square one," Ladig says. The judge hasn't yet granted a stay on the case, and—as with other sagas in Musk's world—it's best to keep in mind a range of potential outcomes.

The same could be said for a future Twitter owned by the volatile billionaire. The apparent commitment to the original terms is a financial coup for Twitter shareholders, especially because other social media stocks have cratered since April—but it's even riskier for Musk. For the service itself, Musk's future ownership raises more questions, such as who might run the company (not Agrawal, judging by their exchanges) and what impact Musk's involvement will have on the network's influence in media and politics.

The hundreds of text messages give insight into Musk's brand of leadership: He's surrounded by friends and foes who make direct appeals to his ego to get things done, whether that's asking for a way into one of his deals or pushing a policy or product they'd like him to enact at Twitter. He's already been propositioned on reinstating Donald Trump, whose account Twitter permanently banned after the Jan. 6, 2020, insurrection for inciting violence. Musk has committed to a "free speech" philosophy that could immediately be complicated by his global business interests.

As the news of Musk's renewed commitment to buying the company went public on Tuesday, employees were a few minutes into a three-hour discussion of priorities for 2023, people familiar with the matter tell Bloomberg News. None of these presentations imagined a future under Musk. If he ends up owning Twitter, the whole exercise would have been a waste of time. Agrawal left the event, but the talks continued with no mention of Musk's change of heart.

Twitter employees, after all, often find themselves in limbo. The company has cycled through top leaders, flirted with other potential acquirers, and appeased an activist investor. After all the whiplash of the high-stakes drama, Twitter isn't Musk's until the shareholders get paid. Ⓑ *—With Kurt Wagner and Edward Ludlow*

# Can Pfizer Repeat Its Covid Success?

● The pharma giant sees a new era, but competitors are circling, and skeptics abound

Pfizer Inc. emerged from the pandemic as the world's most visible drugmaker, with the windfall from its coronavirus vaccine almost doubling its revenue in just one year. And now the shot, coupled with Pfizer's Covid-19 antiviral pill, is poised to make up more than half of its expected $100 billion in sales in 2022. That's left the company with a cash hoard of $28 billion and a big problem: how to engineer a second act.

The pressure is clearly on for Pfizer to show that the muscle it built during the pandemic won't atrophy. Big Pharma companies don't normally double revenue so quickly, and nobody expects that kind of growth to continue. But one thing's clear: Pfizer can't go back to the sluggish path it was on for years, when it largely grew by buying up other outfits with better drug candidates than it was able to discover in-house. Its stock has already fallen 25% in 2022 on fears that it might return to those ways, trailing the broader market and other drugmakers.

"Pfizer was boring before Covid," says BMO Capital Markets Corp. analyst Evan David Seigerman. "They're being penalized because either investors don't see a future for Covid or they don't have visibility into that future."

Before the pandemic, Pfizer had gone for a few years without launching a blockbuster, and several of its current mainstays will soon face competition from generics. But a problem that might once have been solved by going shopping could now require a different strategy. The megadeals that Pfizer executives have long used to turbocharge growth have gotten more expensive and more difficult to complete, with interest rates rising and antitrust scrutiny tightening in Washington.

That's a problem for a company that's often relied on deals so big that almost no other drugmaker could have pulled them off. When Pfizer paid $90 billion for Warner-Lambert in 2000, for example, one of the trophy assets it collected was cholesterol megahit Lipitor, which had annual sales of $13 billion at its peak. In a search for blockbusters

Edited by James E. Ellis and David Rocks

LEON NEAL/GETTY IMAGES. DATA: COMPANY REPORTS

to bolster the pipeline, successive chief executive officers at the company spent more than $200 billion on deals from 2000 through 2020, according to data compiled by Bloomberg.

Even before Covid sickened the first person in Wuhan, China, Albert Bourla, Pfizer's CEO, was already embarking on a path that would make the company into a much different kind of drugmaker.

Bourla, who'd risen through the ranks and taken the top job in early 2019, saw an opportunity to make Pfizer into a version of the kind of nimble, innovative biotechnology company that it had often acquired. He spun off a large division that included storied-but-off-patent products such as Lipitor and erectile dysfunction pill Viagra and announced his intention to focus on high-risk, high-reward areas like cancer and rare diseases.

Now, after a two-year-plus detour when Covid put everything else on the sidelines, Bourla is ready to move on, even if Wall Street is still fixated on the $37 billion that Pfizer's shot brought in last year.

"Nobody asked me about how we're doing with the new products other than Covid," a somewhat exasperated Bourla said after an earnings call with Wall Street analysts this summer. He's promised 6% annual revenue growth for the core business—excluding Covid products—through 2025. Wall Street analysts expect that number is more likely to be 5%.

There's no way Pfizer can re-create the conditions that led to this moment. Governments gave companies billions of dollars to speed up Covid vaccine development. (Pfizer didn't take money, but its vaccine partner, BioNTech SE, received $445 million from Germany.) Regulators allowed for faster pathways to clearance, and the US government placed billion-dollar orders and invoked a Cold War-era law to hurry production. None of that is likely to happen again soon.

Meanwhile, Covid has sparked a surge of investment in messenger RNA technology, which helps teach cells how to make proteins that trigger an immune response in our bodies and is the science behind the coronavirus vaccines from Pfizer and Moderna Inc. Now Pfizer, BioNTech, and Moderna face a legion of upstarts and old-line Big Pharma peers eager to cash in with innovative drugs of their own using mRNA. That means a battle for resources, talent, and promising new treatment candidates that could become future blockbusters.

To much of the world, the technology that made Pfizer's Covid vaccine seemed to come out of nowhere. It was actually built on decades of research. Academics tried, and failed, for years to figure out how to deliver the fragile, synthetic mRNA molecules where they needed to go. Despite advances in the 1990s and early 2000s, no product based on mRNA technology had entered final-stage trials before Covid.

Building on the success of that vaccine is a central part of Bourla's own vision for Pfizer. He's said that he's all-in on mRNA and talked about an abundant pipeline of potential uses for the technology, from a vaccine for flu—which could come to market as soon as next year—to cancer treatments, cures for rare genetic diseases, and a shot for shingles. Pfizer has already put some of its capital to work forging alliances with smaller specialist companies. However, success could take years, and many rivals, including Moderna, are also hard at work on mRNA.

"When Pfizer starts to go after mRNA therapeutics, it'll find potentially bigger hits but also more uncertainty," says Damien Conover, an analyst at Morningstar Inc. "Each time you get a little bit further away from infectious disease—how it's being used right now—you get further from how the technology has been working."

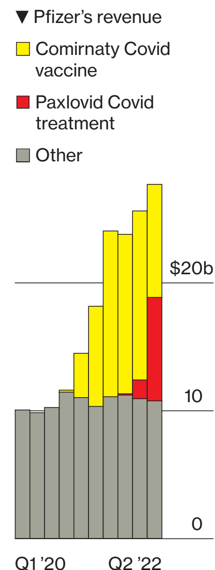
Pfizer wants to bring multiple mRNA products to market within five years—an ambitious target. Therapies often can take more than a decade to move from a lab into the human testing that determines whether regulators will approve them. And about 90% of drug candidates fail in clinical trials.

That doesn't mean labs around the US aren't trying, leading to a fight for scientists. "Students and trainees are being bombarded," says Daniel Anderson, a chemical engineering professor at the Massachusetts Institute of Technology, who says many of his students have left to launch companies or join drugmakers.

Some 43 private companies working with mRNA technology have raised about $1.6 billion in funding in the past 12 months, according to PitchBook Data Inc. Then there are also the big publicly traded giants such as Moderna and BioNTech that are the pioneers in the space.

To compete, Pfizer has been elevating its in-house mRNA experts, including Kathy Fernando, a 44-year-old pharma executive who began her career studying the technology. In 2006 she completed her Ph.D. dissertation on developing an RNA vaccine for HIV. She later left academia for business consulting and joined Pfizer in 2014.

During the pandemic, Fernando was named Pfizer's head of mRNA scientific strategy and worldwide research and development operations. "We don't aim to be the company with the most mRNA programs in our portfolio—we're more selective," she says. ▶



◀ Fernando breaks the question into three parts: evaluating technology, biology, and manufacturing. "The second and third parts–biology and manufacturing–are what differentiates us," she says. It's a hint that Pfizer may not lead in technology, but the company can successfully bring a product to market. Pfizer says that, as of Sept. 4, it's shipped 3.7 billion doses of its Covid vaccine to 180 countries.

Twenty-five miles north of its New York City headquarters, Pfizer is spending almost half a billion dollars to upgrade its Pearl River vaccine R&D campus, the 330-acre site that's home to cutting-edge labs and more than 1,000 staff who were pivotal to the development of the Covid shot.

Pfizer has also turned to external mRNA advisers to pressure-test its strategy and new products. Drew Weissman, a University of Pennsylvania professor in vaccine research credited with developing the mRNA technology used in the Covid shots, is among those who've been tapped for their guidance. Weissman said Pfizer puts "as many as 30 people together and has them battle out ideas over a one-day or two-day event."

Pfizer's rivals are making similar moves, and they're looking beyond just mRNA at other RNA- and DNA-focused medicines. Drug giant Eli Lilly & Co. is hiring talent and scouring for such deals, and it's building a $700 million facility in Boston, the biggest biotech hub in the US. Dan Skovronsky, Lilly's chief scientific and medical officer, says there's no way one company will dominate this space.

"It starts with a couple of players, but the technology becomes adopted by all of pharma and eventually becomes one of the pillars of how they make drugs," he says.

Then there's Moderna, which trades under the stock ticker MRNA. Its CEO, Stéphane Bancel, is skeptical that Pfizer can become a bastion of mRNA innovation. "Tell me one industry where disruption has happened by a large incumbent," he said in an interview at Moderna's R&D day in September. "Pfizer did an amazing job getting the product to development and manufacturing scale. We did the same with no help from a Big Pharma company."

There are questions around how much further Pfizer can get in mRNA without relying on the partner that helped it develop the vaccine in the first place. "Pfizer is now the largest manufacturer of RNA vaccines in the world," Weissman says. "But they were reliant on BioNTech for that knowledge of the platform."

Bourla has been trying to change the perception that Pfizer is dependent on BioNTech to advance its mRNA strategy. "We don't need to work with them," he said in an interview in early 2021, describing it as a "fantastic partnership" but one that wouldn't prevent the company from charting its own course.

So far, Pfizer says it's spent more than $2 billion on mRNA projects, a pittance when compared with its mammoth cash pile. The company has the capacity to spend at least $150 billion on deals by the end of this year, BMO's Seigerman wrote in an April note. But the dealmaking landscape has changed significantly since then, as interest rates have shot up and inflation has spooked credit markets. Global mergers-and-acquisitions volume has slowed to a trickle, with just one deal valued at more than $10 billion announced since June.

Pfizer executives have said they're expecting to do enough deals to add some $25 billion in sales by 2030. But they'll have to do it without attracting too much attention from policymakers in Washington, where antitrust enforcers have been considering tougher merger rules to tackle concentration across industries.

While Pfizer may be all-in on mRNA, it's pursuing other areas as well. Its most promising drug candidates include a vaccine for respiratory syncytial virus (RSV), which hospitalizes or kills more than 100,000 older adults each year in the US, as well as a therapy for obesity and diabetes, and autoimmune and cancer treatments. Although these potential blockbusters tend to get less airtime during investor presentations, and fewer questions, they're critical to Pfizer's post-Covid growth story.

Still, the Covid market alone could bolster Pfizer for several years. Bourla has pledged that the company will continue to dominate the market with next-generation annual boosters, tailored to the latest variants. Seigerman sees the potential for regular demand among those over 50 years old, which in the US alone would be a $7 billion-plus market for Pfizer, a figure he describes as "exciting to have on the balance sheet."

"The question is for how many years," Seigerman says. "There's not a lot of optimism that market will fill out." Indeed, demand for the updated Covid booster has been low, and analysts expect Pfizer's overall revenue from the vaccine to start dropping sharply: from $33.2 billion this year to $10.5 billion in 2024.

And there's skepticism that mRNA alone can prevail against all the health challenges Pfizer aims to tackle. Even if Pfizer hits its ambitious drug development targets, persuades people to keep getting Covid shots, and introduces a groundbreaking flu or shingles vaccine, it'll still have the same competitors, pricing pressures, and

regulatory hurdles it faced before the pandemic.

"RNA is a fantastic platform, but it won't solve everything, right?" says Kathrin Jansen, Pfizer's recently retired head of vaccine R&D who first suggested that Bourla pursue an mRNA shot for Covid. "To think a single technology will solve all your problems—well, it never does." *—Riley Griffin*

THE BOTTOM LINE Pfizer's Covid medicines are poised to make up more than half of its expected $100 billion in sales in 2022. But with pandemic drug demand waning, it's looking for a second act.

# Rebooting Adidas

● The shoemaker is looking for a new CEO who can steer both the brand and the bottom line

Seven years ago, Adidas AG was gaining momentum with hot-selling shoes co-designed by influencers such as Pharrell Williams and Kanye West. But some investors thought managers were spending too much in their quest for cool and started calling for new leadership. They found their man in Kasper Rorsted, a famously frugal Dane whom Adidas hired as its chief executive officer after he produced record earnings at soap and detergent maker Henkel AG.

Rorsted quickly sold off the hockey and golf units and doubled down on e-commerce, fueling profits and prompting Germany's *Manager* magazine to name him the country's CEO of the year in 2019. But since Adidas's shares peaked last year, various blows, blunders, and plain bad luck have conspired to erase most of Rorsted's progress. With its profit margins and stock price falling below their 2016 levels, the company says Rorsted will step down next year to "pave the way for a restart."

The new leader will need to breathe fresh life into the brand, creating another era of hot sneakers and apparel but keeping a close eye on finances. While the world continues to embrace casual fashion and fitness—trends that gained strength in the Covid-19 era—sports companies have struggled. Nike's shares are down about 40% in the past year, Puma is off by about half, and even Wall Street darling Lululemon Athletica has fallen almost a quarter.

Investors are fleeing consumer-oriented stocks in response to rising interest rates and growing fears of a bruising recession. And competition is heating up, with On Holding AG—a Swiss newcomer backed by tennis giant Roger Federer—gaining ground and luxury houses elbowing their way into casual wear. And the industry is still recovering from Covid lockdowns in Vietnam that shuttered factories for months, crippling production of everything from yoga pants to Air Jordans.

Even more problematic is China, where Western brands face consumer boycotts. The problem is particularly acute for Adidas, which has increasingly looked to the country for growth. While that was a big advantage in 2019—when the company recorded more sales in Asia-Pacific than it did in Europe or North America—today it's a liability, with revenue in China collapsing by a third in the first half.

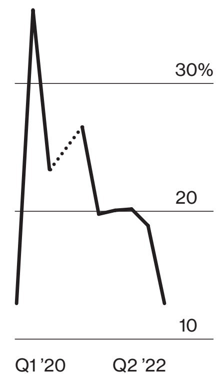
In April, Rorsted appointed a new head of Chinese operations: Adrian Siu, a 17-year Adidas veteran who had left in 2019 to take over a lingerie business. But Adidas continues to trail Nike Inc. in China, according to data from online megastore Alibaba, as the US rival has done a better job of clawing back market share from fast-growing locals Anta Sports Products Ltd. and Li Ning Co.

The overarching problem, investors and analysts say, is that Adidas has gotten stale, and it's time for fresh ideas and a new approach to marketing. "The issue at Adidas is product development, brand recognition," says Ingo Speich of Deka Investment in Frankfurt, a major shareholder. The CEO needs to be more in tune with what the creative team is up to, "and Rorsted is not the manager to do that."

In his first three years in the job, Rorsted benefited from surging sales, especially for retro offerings such as the Stan Smith sneaker and Superstar basketball shoe that had been cooked up under his predecessor, Herbert Hainer. The executive most often credited with those successes is Eric Liedtke, who had long been considered Hainer's potential replacement. Liedtke promoted ideas such as using recycled ocean plastic in some shoes and apparel, and he nurtured collaborations with West, Williams, and Beyoncé. But two years ago Liedtke left the company after 25 years, and last summer he launched the Unless Collective, a maker of casual clothing.

Liedtke is frequently named as a potential replacement for Rorsted—or at least as the type ▶

▼ Share of Adidas's revenue derived from China



● Rorsted



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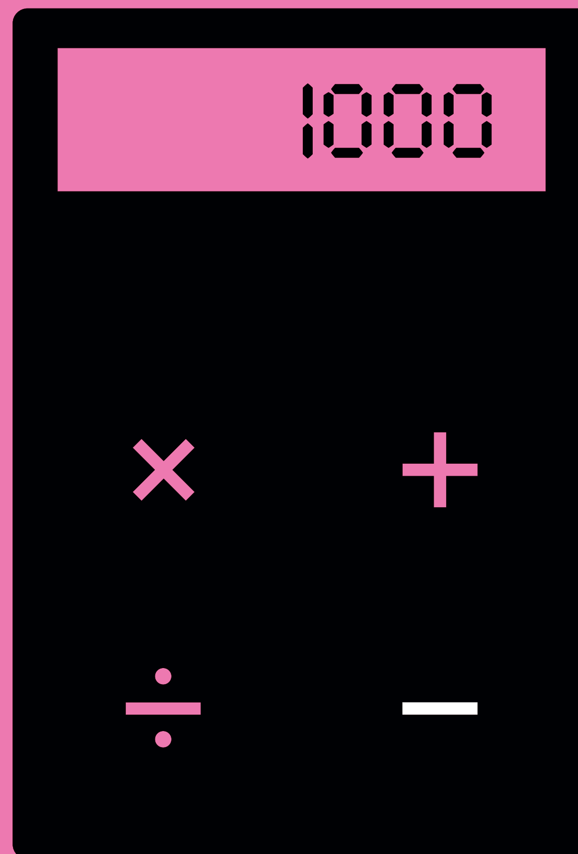


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◀ of leader Adidas should seek. "The company needs to get back to the creative edge," Cowen analyst John Kernan said in a Sept. 16 note, that it had "when Eric Liedtke led the Adidas brand." Liedtke says he hasn't had any contact with Adidas about the job. Adidas declined to comment.

Another name frequently mentioned is Puma SE CEO Bjorn Gulden, who's often credited with being equally strong with both numbers and creative matters. Yet it's hard to imagine Gulden making the move. The two global brands are headquartered in Herzogenaurach, a town of 23,000 nestled in the Bavarian hills two hours north of Munich by train. They were founded by brothers who grew to hate each other after World War II, and the rivalry is a big part of the culture of both companies. Gulden declined to comment.

Although Rorsted oversaw a fivefold increase in online sales and embraced efforts to cut down on single-use plastics, his tenure has been marked by various missteps. He sold Reebok after multiple failed efforts to recapture the brand's 1980s magic, but he only got $2.5 billion—about a third less than Adidas had paid 15 years earlier. Early in the pandemic, Germans cried foul when Adidas refused to pay rent at stores shuttered because of Covid lockdowns, requiring Rorsted to apologize and ultimately pay up. The company's image took another hit after Adidas needed a government bailout topping €2 billion ($2 billion) to boost liquidity. Then a couple of months later, Rorsted's human resources chief resigned amid criticism of the company's record on diversity.

The highest-profile kerfuffle has centered on West, whose Yeezy sub-brand accounts for as much as 8% of Adidas's sales, researcher Cowen estimates. But the partnership, championed by Liedtke, is now very much in question, with the rapper accusing Adidas of copying his ideas and mishandling his product line—and threatening to walk away long before the deal expires in 2026. In September, West posted a fake *New York Times* article declaring Rorsted "Dead at 60" on his Instagram feed, then quickly deleted it.

Adidas declined to comment on the matter, but West says he aims to take full control of his fashion products. "No more companies standing in between me and the audience," he says. He's been urging potential job candidates with retail expertise to contact him. One person he says he's talking with: Eric Liedtke. —*Tim Loh, with Kim Bhasin and Jinshan Hong*

THE BOTTOM LINE Adidas's stock price more than doubled in Rorsted's first five years, but its profit margins and shares have fallen below their 2016 levels, prompting the search for new leadership.

MALTE OSSOWSKI/SVEN SIMON/PICTURE-ALLIANCE/DPA/AP IMAGES

# BW Talks Melanie Kreis

## The pandemic highlighted the importance of having robust supply chains and logistics, Deutsche Post DHL Group's chief financial officer says. We talked to her about why some of the crisis's lessons are here to stay. —*Tom Mackenzie*

● Holds degrees in physics from SUNY Stony Brook and the University of Bonn ● Earned an MBA from Insead business school in 2000 ● Worked as a consultant at McKinsey and at private equity firm Apax Partners ● In 2004, joined DHL, where she was named CFO in 2016

Everyone is paying more attention to supply chains. Is this just a reaction to the pandemic or a structural shift?

Everybody has realized that being dependent on just one supplier in one province in one country is probably not a good idea. So they want to build more resilience into the supply chain by, for example, going from China into Vietnam. For us, that's a great opportunity, because we are the most international logistics company there is. So we can work with our customers on rejiggering supply chains.

You're known for not reacting hastily. How's that worked out?

I think back to the second quarter of 2020, when all of a sudden, in April, things got to a standstill here. There were, of course, debates: Do we lay off people? Do we reduce the workforce? Fortunately, we didn't. We would have drowned in the volume surge we then saw when we had to ship all the protective equipment and when the e-commerce surge took off. So I think having the plans ready [is key], defining the trigger points about when you should go into execution, but not acting in a rash way.

Is that conservative approach something you're holding to now, even with fears of a tough economy ahead?

I'm telling my organization to prepare for a hard and cold winter. And if it's then mild, and you have bought lots of warm sweaters and you don't need them, then great. But let's get ready and get the warm sweaters. So I think we know what we would do if things would get worse, but we are not pushing the trigger yet. So we're still hiring.

Are you worried customers will push back on higher prices in a recession?

I think the last two years have shown that a reliable, high-quality supply chain comes at a certain price tag. And when customers understand and appreciate the value of our service, I think that is the most important basis for getting adequate pricing through.

● Edited for clarity and length.

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# Silicon Valley Doesn't Want To Share

Customers expect their products to work well together. They often don't

Driving to work each morning, Amazon Senior Vice President David Limp asks Amazon Alexa to play Amazon Music in his Mini Cooper, a car manufactured by an automaker that has a partnership with Amazon.com Inc. At the office, he takes notes in meetings on his Amazon Kindle Scribe. He listens to the Amazon-exclusive podcast *SmartLess* on his way home. There, an Amazon Echo Show in the kitchen displays photos of his kids that he stores in Amazon Prime's cloud. When Limp goes biking, he wears his Amazon smart glasses, the Echo Frames. The star of his family's movie nights is their Amazon Fire TV.

Limp detailed his loyal routine at Amazon's biggest product debut of the year, broadcast online on Sept. 28, showing off how a gaggle of next-generation Amazon products–voice-activated Echo speakers, Halo sleep trackers, and Ring home security cameras–fit seamlessly into a modern lifestyle. "There's a paradigm shift happening in consumer electronics," he said. "Technology needs to be personalized and intuitive, enough to adapt to you and your environment, not the other way around."

But Amazon's event didn't seem to prioritize a response to one reality of the tech environment: It's common for people to mix and match products, the monomaniacal routines of the company's executives notwithstanding. Amazon Prime subscribers might even own Apple devices and rely on Google services. For those consumers, incremental improvements in devices are probably less important than forging better connections between the different tech fiefdoms they're forced to live with. As these behemoths ready their slates for the upcoming holiday season, how can they fix this growing customer problem if they pretend each other's products don't exist?

Tech giants have long sought platform dominance to sustain their sales, while resisting integrations with other ecosystems that even their own customers are begging for. Microsoft Corp., fearing further disruption of Windows PCs, refused to release its ubiquitous Office suite on Apple Inc.'s

Edited by Joshua Brustein

iOS and Google's Android for years. Amazon once banned Apple and Google streaming-TV devices from its online retail store because they didn't "interact well" enough with Prime Video. Apple still doesn't allow iMessage on Android or Windows and released its music service for Amazon and Google smart speakers only after those companies had amassed about 95% of the US market.

This self-interested behavior could worsen if the economy continues to suffer and Big Tech gets more aggressive about protecting revenue. Headwinds are already whipping. Market research firm IDC forecasts a 6.5% drop in smartphone shipments in 2022, a decline that Bloomberg News has reported is causing Apple to pull back on plans to increase iPhone production. Demand for wearable computers, smart speakers, TVs, and streaming devices is also cooling, according to IDC.

If fall product events from Apple, Google, and Samsung are any indication, the industry's strategy is to wring more dollars out of each existing customer by upselling them on accessories and subscriptions that function uniquely well within each ecosystem—and make it ever more inconvenient to shift to a competitor's platform. An Apple spokesperson disputes that the company makes it hard to use competing products, citing the vibrancy of its app store and suggesting that it's easy to switch device ecosystems. Google and Samsung spokespeople say their Android and Galaxy experiences are, respectively, supportive of user choice and open to integration with partner devices.

IDC analyst David Myhrer says 30% of US households account for 71% of Apple's revenue, so it's common for some to own five or more Apple devices, whether iPhones, iPads, AirPods, or MacBooks (in addition to paying for Apple services such as Fitness+ and iCloud). "Of what goes into the Apple ecosystem, very little comes back out," he says.

● Limp

● Cook

Myhrer says Apple's expansive ecosystem is a result of its innovative approach to design, but it's also true that forcing loyalty is part of the plan. At the iPhone 14's unveiling on Sept. 7, Chief Executive Officer Tim Cook sounded a lot like Limp when he promised to deliver products that are "incredibly personal" and "intuitive." But it was telling that the new iPhone home screen demos featured only apps that Apple itself makes, such as TV+, Music, and Maps, in the background, as if acknowledging the existence of popular services like Google Maps, Prime Video, or Spotify would somehow weaken the world's most valuable corporation.

Amazon likewise avoided featuring competitors during its showcase. The company doesn't make its own phones or laptops, so it showed photos and videos of people interacting with Amazon's new software services using generic computers. (Some may have been powered by Apple, Google, or Microsoft, but good luck finding their logos.)

The problem with products and services that dissuade customers from switching ecosystems, known as a "lock-in," is that it can harm the user experience and hamper innovation. Take speakers with virtual assistants. According to third-party research, Apple now owns the majority of the US smartphone market, and Amazon is still the leader in smart speakers, making it more likely that iPhone users will interact with an Alexa-enhanced Echo than a Siri-voiced HomePod. Yet it's far easier to sync an iPhone with a HomePod than it is with any non-Apple accessory: Simply hold the phone near the speaker to begin a streamlined setup process. That mechanism isn't available to Amazon, which is forced to instruct users to download an Alexa app, pair with Bluetooth and Wi-Fi, and complete the clunky install manually.

This self-preferencing is coming up in discussions around whether the biggest tech companies engage in anticompetitive behavior. An executive from Tile Inc., a startup that makes a location tracker which attaches to keys and other commonly ▶

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◀ misplaced items, testified before US House of Representatives and Senate subcommittees in 2020 and 2021 that Apple designed its software in a way that favored its own location-tracking tools over independent alternatives. "It's like playing a soccer game. You might be the best team in the league, but you're playing against a team that owns the field, the ball, the stadium, and the entire league, and they can change the rules of the game in their own favor at any time," said Kirsten Daru, then Tile's general counsel. In April 2021, Apple released AirTags, which function similarly to Tile's products. Apple has said that it designs its products to protect user privacy and that its AirTag was not a copy of Tile.

At this point, the customer-first design principles the tech industry claims to pride itself on would likely be served by more collaboration. A real paradigm shift would be if Tile could interact with AirTag, or if Alexa and Siri could communicate with each other. An Amazon spokesperson says they are not creating lock-in problems and they strongly support compatibility of voice assistants across devices.

When collaboration does happen, it's usually either in an area where no clear leader has yet emerged or when one company dominates the market to a degree that others are forced to relent. Amazon, Apple, Google, and Samsung have agreed to a standard internet of things protocol called Matter, with the intention of leading to more device interoperability, with compatible home-automation products coming later this fall. Limp also notes that there are more cross-platform services than there have been in years, citing how Apple's AirPlay works on some Fire TV models and how Apple Music can now be played on the Echo. "People sometimes ask me the question, in a very direct way: 'Are you purposefully keeping these things from your customers?' " Limp says. "The answer is no. As soon as we had the ability to put Apple Music on an Echo, we did. It was a no-brainer."

Limp is certain that product usage will become more "heterogeneous" in the future: "If I didn't have the Ring app on my iPhone, I wouldn't be able to look at my Ring" home cameras. He admits he's flirted with the other side. He calls his iPhone and MacBook "near and dear" to his heart, as he used to work on the Macintosh precursor at Apple in the 1990s. He's less interested in setting foot in Alphabet Inc.'s hardware territory. "I can't think of a Google product that I have," he says. *—Austin Carr, with Matt Day*

THE BOTTOM LINE Customers would benefit from greater cooperation between the companies that make their gadgets and services, but those companies don't always play nice.



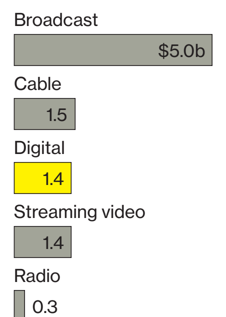
# Politicians Are Stuck With Facebook

● For campaigns seeking to advertise on social media, there aren't other good options

Beth Becker had just finished teaching Democrats how to use Facebook's digital tools at the Netroots Nation conference in Pittsburgh in mid-August when she heard about a protest taking place down the hall. Angry demonstrators were targeting the befuddled and apologetic employees of Facebook's parent company, Meta Platforms Inc., who were manning a booth to explain how cool the metaverse will be.

Becker, who runs her own digital strategies firm, says she understands why people were upset about Meta sponsoring a progressive gathering after years of infuriating reports on the company's content moderation failures and data missteps. But she says other digital platforms offer nowhere near Meta's political advertising options. "We still have to use Facebook," she says. "Most of the other platforms won't take our money."

A decade ago political campaigns loved Facebook for its ability to turn clicks into donations and its email lists of likely voters. But in interviews, a dozen ad agency executives and digital strategists said they now see a platform that offers a fraction of its previous return, because a stagnating user base and policy changes have made it harder to target specific ▶

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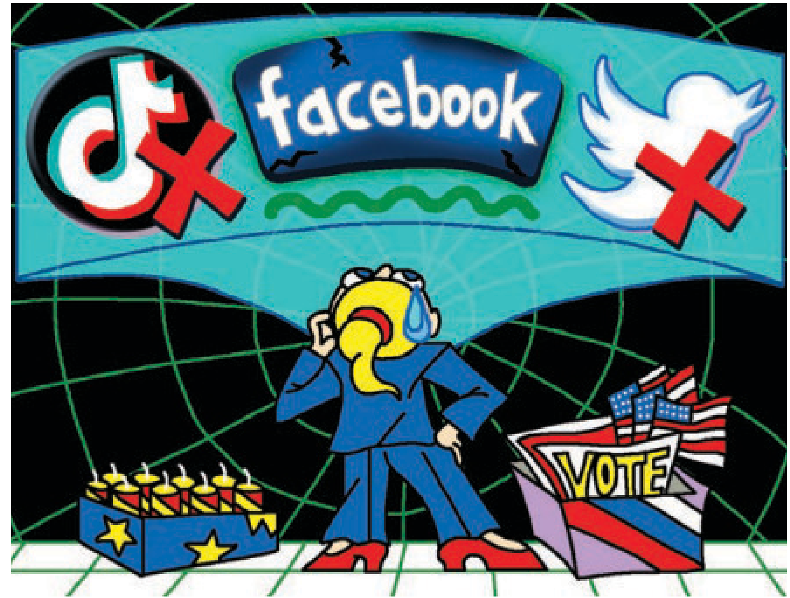
◀ kinds of voters. Meta declined to comment.

Campaigns will spend a record $9.7 billion this election cycle, according to tracking company AdImpact, up 144% from the 2018 midterms. Digital spending is on pace to represent 15% of that total. Concern about political messaging in social media has grown since the 2016 election, when Russia-linked groups targeted American voters and the Trump campaign employed detailed user data to create ads to influence specific populations, such as posts discouraging Black people in South Florida from voting for Hillary Clinton.

Meta has made changes to prevent abuse; other platforms decided it wasn't worth it. TikTok, Twitter, and Twitch, the Amazon-owned video streaming service, don't allow political ads. Snapchat and Reddit, which do allow them, have been less of a focus for political advertisers. Meta's photo-sharing app, Instagram, has the same rules for political ads as the original Facebook platform, although it's never driven the same broad-based engagement. That leaves YouTube, whose parent company, Alphabet Inc.'s Google, has strict limits on how advertisers can target political ads. "The issue is that there's not a great alternative at the moment," says Megan Clasen, who led paid media strategy for President Joe Biden's 2020 campaign and has since started her own company, Gambit Strategies.

Facebook's strength has always been in getting users to take an action, such as donating money or handing over their email address. The platform doesn't lend itself to watching 30-second videos that might change how people feel about a candidate. Digital strategists say a dollar spent on Facebook used to bring campaigns as much as $1.30 in donations, whereas now they merely hope to break even. "When we first started doing this in 2011, 2012, we saw absurd return on investment from Facebook," says Eli Kaplan, a founding partner of Rising Tide Interactive, an ad agency catering to liberal candidates and causes. "It's stunning how much it's changed."

The biggest setback for advertisers on Facebook is Apple Inc.'s new privacy policy, which allows people to opt out of app tracking, making ad targeting much less precise on iOS devices. Google has said it plans to take similar steps for its Android devices. Meta also has special rules for political ads, including transparency requirements that stem from foreign and dark-money efforts to undermine the democratic process, and a ban on new ads in the final days before an election. In January, Meta removed the option for advertisers to target an audience based on keywords that even have a whiff of politics—such as "minimum wage" or "fossil fuels." Although many of the policy changes are designed as guardrails against disinformation, some have also made political ads less effective, says Erica Monteith, senior vice president at GMMB, an agency that's worked with every Democratic president since Bill Clinton. "They definitely over the years have taken away our ability to target political ads," she says, "chipping away" at Facebook's usefulness for campaigns.






Political advertisers are increasingly interested in placing video ads on streaming services. But putting ads on Hulu, YouTube, Paramount+, and Peacock takes more effort than buying them on a single social media platform. Digital strategists are still waiting to find out whether Netflix and Disney+ will allow political messages on the ad-supported services they're planning to introduce in the coming months. (Disney has said it won't do so initially.)

**"The issue is that there's not a great alternative at the moment"**

Facebook is well-suited to the campaign stage ramping up now: persuading supporters to actually cast ballots. But campaigns are looking for alternatives, including sending emails and texts to voters. Technological advances have made it easier to send high-quality video over SMS, says Jon Adams, founder and chief executive officer of TAG Strategies, a political company that caters to Republicans.

Many of the young people who could vote in their first election this November aren't on Facebook. As that cohort becomes more politically engaged, it's possible that Facebook's importance will recede. "I don't think we're there yet," Becker says. "But it's always something we're keeping an eye on." —*Anna Edgerton*

THE BOTTOM LINE Facebook's policies on political ads, combined with restrictions on targeting, have lessened the impact of a once-powerful tool for political campaigns.

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# How Britain's Bond Market Almost Toppled

● Pension funds use derivatives to reduce risk—but the strategy backfired when interest rates spiked

Mike Johnson, a partner in the pension and risk consulting firm Hyman Robertson LLP, was on the phone with a client on Sept. 23, casually looking at the price of British government bonds—known as gilts—on his computer screen, when a sharp, sudden decline in prices made him sit up. The move came as the UK's new government was announcing an unorthodox plan to borrow vast sums of money to reduce taxes. Johnson immediately understood that the shock could set off a sustained wave of selling as investors—including his client—scrambled to meet calls for more collateral. He and his client drafted an email to the Bank of England warning of a gilt market meltdown.

At a time when Britain's economic outlook was already grim, the government's plan spooked markets, tanked the pound, and unleashed a chaotic 48 hours that forced the BOE to spend billions buying bonds. After several days of public outcry, the government decided to cancel one of its most controversial tax cuts.

The turmoil revealed something that many had failed to realize: The government bond market was far more fragile than it had appeared.

Like other meltdowns—remember MBSs, CLOs, and CDOs—this came with financial engineering and an obscure acronym: LDI, or liability-driven

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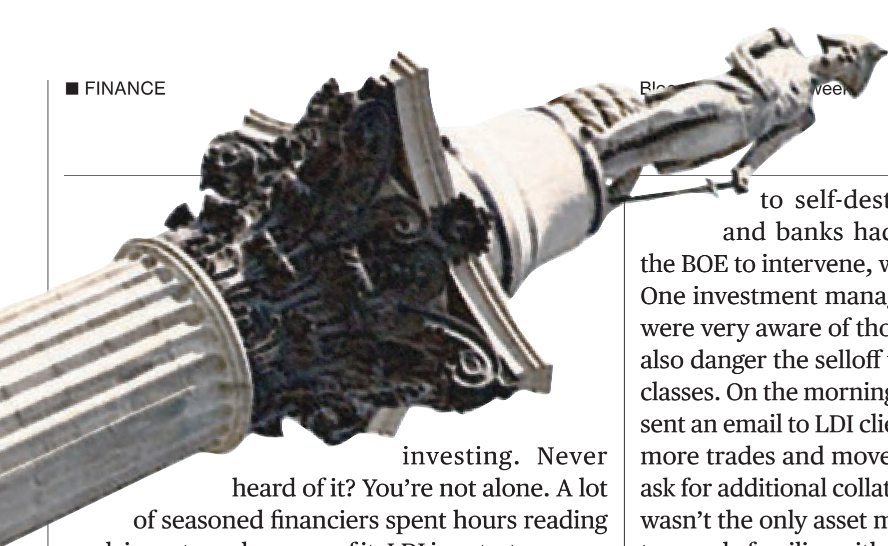


investing. Never heard of it? You're not alone. A lot of seasoned financiers spent hours reading explainers to make sense of it. LDI is a strategy popular with defined benefit pension plans, which guarantee retirees a fixed payout regardless of swings in financial markets. Many pension funds use derivatives to help keep their assets and liabilities balanced. Typically, the funds hold derivatives that gain value when interest rates go down and lose value when they rise. Under the terms of the derivatives contracts, when the value falls, the funds can face margin calls—demands to put up more collateral.

The long stretch of low interest rates since the global financial crisis made the strategy seem safe. In 2020, UK pension funds were using derivatives to hedge about £1.5 trillion ($1.7 trillion) in liabilities, more than three times as much as in 2010, according to the UK's Investment Association.

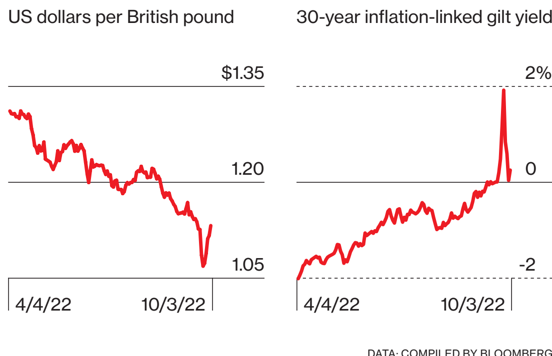
By Sept. 26, prices for long-term government bonds had collapsed, as pension funds struggled to raise cash to meet margin calls and started selling gilts. The yield on 30-year inflation-linked bonds—favored by funds because of their long maturity and protection against price increases—soared 68 basis points (yields rise when prices fall). On Sept. 27, it spiked 76 points—a record one-day increase.

Fund and pension managers got caught in a vicious cycle: They had to put up additional collateral because prices were plunging, and to raise cash they sold bonds, which sent prices down further, forcing them to put up more collateral. Because prices were falling so swiftly, they were being asked for the cash immediately, not in the six to 10 days typically required. The result was that the whole system just broke down, according to people who were involved. "I've been in gilts 47 years, and you think you've seen it all, but this week proved me wrong," says George Whitehead, a bond sales specialist at Astor Ridge LLP.

In the center of the drama were some of the country's largest asset managers, including BlackRock, Legal & General Group, and Schroders. Some managers trapped in the loop said it wasn't until the afternoon of Sept. 27 that they understood it was the funds themselves causing the downward spiral and that only intervention would stop the course to self-destruction. Fund managers and banks had already started pushing the BOE to intervene, warning of a systemic crash. One investment manager said that policymakers were very aware of those risks and that there was also danger the selloff would spill into other asset classes. On the morning of Sept. 28, BlackRock Inc. sent an email to LDI clients saying it would unwind more trades and move assets to cash rather than ask for additional collateral to meet margin calls. It wasn't the only asset manager to do so, according to people familiar with the matter. Finally, the BOE announced at 11 a.m. that it would immediately buy as many long-term government bonds as necessary to stabilize the market, and the bleeding stopped. UK 30-year bonds posted their biggest-ever rally.

The near-collapse of the gilt market will have a long-lasting impact. It exposed the market's illiquidity issues and is likely to lead to policy changes. Over the past decade, regulation and politics have pushed pension funds to invest more heavily in bonds, because they're considered safe assets that reduce portfolio risk. Pension funds are one of the main buyers of British government bonds. And with the BOE set to end its program of buying government bonds to help keep interest rates low this month, market participants are already worried about another crisis. Some are calling for rules to reduce LDI funds' vulnerability to rate increases. "This is not a market you can give back to the operators and just step away," says Marino Valensise, chief investment officer at Cardano, which manages portfolios and LDI strategies for pension funds. "This is a small market with a lot of people doing the same thing at the same time." *—Loukia Gyftopoulou, Greg Ritchie, and Benjamin Robertson*

Race to the Exits




DATA: COMPILED BY BLOOMBERG

THE BOTTOM LINE Pension funds in the UK have increased their use of derivatives to balance assets and liabilities, leaving them vulnerable to margin calls in times of stress.

# The Great Bitcoin Jailbreak

● Feds seized a storage device full of ill-gotten tokens. And then someone started stealing them

Gary Harmon grinned as he lounged in a bathtub full of dollar bills surrounded by scantily clad women. The moment, captured in a photo on his cellphone, could be part of his undoing. To US prosecutors, it's evidence that he suddenly came into a lot of money.

The prosecutors accuse Harmon of a very unusual crime: remotely swiping Bitcoin stored on a computer device the government had already seized in another case, brought against his older brother, Larry. As authorities watched helplessly, 713 digital tokens—then worth almost $5 million—were somehow spirited away from the "hardware wallet" they were holding in an evidence locker.

Larry Harmon, who's since pleaded guilty to laundering $311 million through crypto transactions, swore up and down he wasn't involved in the disappearing act. Instead, Larry, 39, pointed the finger at Gary, 30, and ultimately helped to nail him. Gary is in federal jail in Washington, D.C., awaiting trial, and Larry is free on bail near Akron. The cases of the Harmons—literal crypto bros—show how the IRS and the FBI are succeeding in collecting evidence but still face challenges on the blockchain frontier. Authorities had to track digital money moving through a tangle of anonymous accounts to connect it to Larry. When they tried to seize it, they faced a problem: How do you put a fence around a quicksilver asset such as Bitcoin?

Larry's arrest in February 2020 was something of a milestone in crypto enforcement. In addition to the large sums of money involved, it was the first time anyone had been charged with crimes related to "mixing," a practice that makes it much harder to trace transactions by jumbling together tokens from different owners. In 2014, Larry created a search engine called Grams, which helped users scour the darknet for illegal drugs, guns, and hacking services. Then users could pay via a mixing service he ran called Helix, earning Larry 2.5% of each transaction.

Mixing's advocates in the crypto world say it enhances privacy. But under the online moniker "gramsadmin," Larry touted Helix as a way to prevent law enforcement from tracing tainted Bitcoin.

Business took off. In late 2016, AlphaBay, then the largest market on the darknet, started steering its customers to Helix. US authorities were watching. An undercover FBI agent transferred Bitcoin from AlphaBay to Helix, establishing a link between them. In July 2017 the US shut down AlphaBay, calling it a major source of heroin and fentanyl. Authorities didn't yet know who ran Helix. Months later, Larry closed down the mixer, having performed 356,000 Bitcoin transactions. More publicly he developed Dropbit, an app he promoted as the Venmo of crypto for transfers between users.

**"If I took it, why wouldn't I take it all?"**

The US hunt to identify Helix's operator picked up when IRS criminal agents joined the case. Bitcoin transactions are executed on a blockchain, a publicly viewable online database. The coins move between accounts with no names, just long strings of letters and numbers. Crypto transactions may seem free of fingerprints, but they often can be tracked down when individuals try to turn coins into cash. That's where Larry made some mistakes.

Working with Chainalysis, a blockchain analytics company, the agents studied thousands of Helix transactions, subpoenaed emails, and ultimately found one involving a website that allows users to buy gift cards with Bitcoin. An email associated with Larry was used to open the account, says a person familiar with the matter who wasn't authorized to discuss the case publicly.

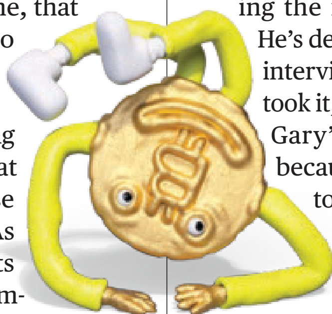
Agents built a detailed financial picture of Larry. Inspecting his cloud accounts, they found a Google Glass photo of a computer screen showing the Helix

ILLUSTRATION BY CHARLES DESMARAIS

administrator page. In early 2020, agents arrested him at his Akron office, where they also found a Trezor crypto storage device, a small computer attachment that looks a bit like an MP3 player.

Gary lived across the hall from the office. He talked to agents that morning and attended the hearing where prosecutors convinced a judge that Larry was a flight risk and should stay locked up. He was moved to a Washington jail, but when Covid-19 exploded, his lawyers filed paperwork seeking to have him released on bail. Among the letters of support was one from Gary, who wrote effusively about Larry's positive influence on his life, saying his older brother had given him a job, taught him coding, and "truly made me a better person."

Assistant US Attorney Christopher Brown said at the bail hearing on March 13, 2020, that Larry had "potentially tens of millions of dollars" in crypto assets that were illegal proceeds. Agents couldn't gain access to them from the storage device found in his office because they didn't have the correct passphrases to unlock them. But they could see, looking at the blockchain online, that addresses they had traced back to Larry controlled the money.



Hardware crypto wallets hold the cryptographic private keys—long strings of numbers and letters—that allow someone to go online and use a Bitcoin address for transactions. As a backup, Trezor hardware wallets can generate a "seed phrase," a combination of as many as 24 words that can re-create those private keys on another device. In essence, anyone who knows the magic words and an additional PIN can take control of the Bitcoin. Unplugging the wallet device and physically locking it away is no protection. Brown warned that Larry could remotely take Bitcoin and that the government would be powerless to stop it. "Until we can secure them and transfer them to a government wallet, those are available for him or his family members to transfer," he said in court. US District Judge Beryl Howell granted bail anyway.

Over six days in April 2020, IRS agents discovered Bitcoin was moved from the addresses they knew about. Prosecutors went back to court. Howell said she was "very skeptical" that the crime had occurred without Larry's knowledge and direction. "Do you understand that?" the judge asked. "Yes, I do know," Larry said. "Don't try and be cute with me," the judge snapped.

Howell ordered Larry to turn over all his passwords so agents could transfer the remaining 4,164 Bitcoins—then valued at $40 million—to a secure wallet. Larry did, and the thefts stopped. He continued to deny any role in the caper, but if it wasn't Larry, who was it?

Within a month, Larry told prosecutors that Gary was the culprit, as did an informant. It took prosecutors 15 more months to get Larry to plead guilty to money laundering and agree to provide evidence against Gary and darknet operators. Larry faces up to 20 years in prison, but his cooperation with prosecutors will likely earn him a lesser sentence. He's also been hit with a $60 million civil fine from the US Department of the Treasury.

Federal agents began building a case against Gary. An informant told them Gary had asked his advice on Bitcoin gambling services, records show. The source believed Gary wanted to use them to mix Bitcoin he took from Larry. Gary is "not the sharpest tool in the shed and did not think through the consequences for his brother" before he moved the Bitcoin, the informant said.

Agents later found four emails sent to Gary's Gmail account from no-reply@trezor.io, reflecting the re-creation of wallets on devices. He's denied taking the Bitcoin. When agents interviewed him in July 2020, he said, "If I took it, why wouldn't I take it all?" Recently, Gary's lawyer said in court that "just because the government cannot manage to keep up with its technology, that is not the defendant's problem."

The government says agents traced 519 of the stolen Bitcoin through two mixers. Although the mixing hides where the money went, prosecutors say the transactions correspond to a "dramatic transformation" in Gary's finances. They say he deposited 68 Bitcoin with the BlockFi finance company, which lets people borrow against their coins. He used most as collateral for a $1.2 million loan. Some of that went to buy a luxury condo in Cleveland, prosecutors said. And then there was the picture on his phone, included in the government's court filings, of the bathtub of bills.

Gary was arrested in July 2021. Like his brother, he requested bail. Prosecutors said to secure bail Gary should have to turn over seed phrases to the stolen Bitcoin. His lawyer said that condition would force him to admit crimes, which violates his Fifth Amendment right against self-incrimination.

At a hearing in July, prosecutor Brown said Gary turned down two plea offers. His trial is scheduled for February. —*David Voreacos*

THE BOTTOM LINE Bitcoin's design makes it difficult for authorities to trace or seize. But law enforcement can track down owners of crypto tokens when they try to turn them into cash.

# Europe's Huge, Unusable Gas Field

● Earthquake risks mean the Dutch are unwilling to plug the Russia-related energy shortfall

Beneath the windmill-dotted marshlands of the Netherlands lies Europe's largest natural gas reserve. The sprawling Groningen field has enough untapped capacity to replace, as soon as this winter, much of the fuel Germany once imported from Russia.

Instead the field is in the process of shutting down, and the Netherlands is rebuffing calls to pump more, even as Europe braces for perhaps its toughest winter since World War II. The reason: Drilling has led to repeated earthquakes, and Dutch officials are loath to risk a backlash from residents by breaking promises.

Groningen has been a mainstay of Europe's gas supplies since 1963. Even after a half-century, there's still about 450 billion cubic meters of extractable gas in reserve—worth around $1 trillion. More critical, there's room to extract around 50 billion cubic meters per year more than is flowing at present, according to Shell Plc, one of the two major partners involved in operating it.

Locals, though, say the continent needs to look elsewhere. Wilnur Hollaar, 50, who's lived in Groningen for almost two decades, is still seething over the way officials ignored his concerns. "When I bought this house in 2004, it was a palace," Hollaar says of his home, which was built in 1926 and features stained-glass windows and detailed stonework. But like thousands of homes in the area, it's been damaged by quakes; it's full of cracks and the facade is sinking. "My house has turned into a ruin," he says.

Dutch mining minister Hans Vijlbrief says that it's dangerous to keep producing but that the country can't ignore suffering elsewhere in Europe. A lack of gas "could force us to make that decision," he says, adding that it could be a safety issue if hospitals, schools, and homes can't be heated properly.

Russia, which accounted for about a third of Europe's natural gas imports before it invaded Ukraine, has curbed supplies in response to sanctions. And recent explosions on the Nord Stream pipeline have effectively cemented the reduced level of flows to Germany. The extra flow that Shell estimates could be brought online almost immediately would be more than enough to replace the 46 billion cubic meters Germany imported from Russia last year.

Dutch officials have said that if Germany needs more energy, a safer option would be to further prolong the life of its nuclear plants. Germany has opened the door to such a move, which would be a policy reversal if implemented. The government said last month that two facilities slated for closure would be available beyond this year if needed.

European Union Internal Market Commissioner Thierry Breton said in a recent speech that the Netherlands should reconsider its decision to close Groningen, and Vijlbrief has been pressed by counterparts from other EU nations as well, but the country is holding the line for now. Prime Minister Mark Rutte won't entirely rule out using Groningen to bolster supplies, but "only in an extreme case if everything goes wrong," he says, and it isn't needed right now.

Groningen recorded its first small tremors in 1986. Since then, there have been hundreds more. Although most are undetectable except by instruments, a magnitude 3.6 earthquake hit the province in 2012, resulting in thousands of property damage

Edited by Ben Purvis and Cristina Lindblad

IMKE LASS/BLOOMBERG. DATA: NEDERLANDSE AARDOLIE MAATSCHAPPIJ

claims. Starting in 2014, the Dutch government has placed ever-stricter limits on production from the field, and the output dropped from 54 billion cubic meters in 2013 to an expected 4.5 billion cubic meters this year.

Of the approximately 327,000 homes in the region, at least 127,000 have reported some damage, according to the Groningen Mining Damage Institute. More than 3,300 buildings have been demolished in the area since 2012 because earthquakes have rendered them unsafe, Dutch broadcaster NOS reported.

Rutte delivered a public apology before parliament in 2019, but the Dutch government is still reeling from accusations that it was insensitive to complaints and happy to rake in revenue. Adjusted for inflation, the field yielded a total profit of €428 billion ($422 billion), of which the Dutch state received €363.7 billion over the past 60 years, according to newspaper *Het Financieele Dagblad*.

Around Groningen, passions run high. Hollaar was offered compensation of just €12,000 for damage to his home in Roodeschool. He reckons the value of his house plunged by €550,000 and says he was convicted of threatening an inspector who evaluated it.

Albert Heidema, 69, retired after working as an agent combating drug trafficking and now chairs a local action group called Ons Laand that fights against what he calls "the injustice" he says Groningers face. Back in 2015 an inspector told him his house in Appingedam was "broken in half," but he's been waiting since then for an official decision on demolition. He underscores the area's plight by showing pictures of damaged houses, stacks of paperwork, and the town's earthquake meter, which registers every vibration. "The earthquakes really get under your skin," he says. "At night every sound wakes me up. I feel unsafe in my own house."

The Groningers' predicament has won the sympathy of a growing number of Dutch voters and even prompted a skewering of the government by a popular late-night television host, whose riff on the situation went viral online.

Vijlbrief acknowledges that over the years the Dutch government has let down people such as Hollaar. Together with Nederlandse Aardolie Maatschappij—the Shell and Exxon Mobil Corp. venture that runs the field—the government's already paid €1.65 billion in compensation. But that's a fraction of what residents want. Although taking some of the blame on behalf of the government, Vijlbrief also wants Shell and Exxon to play a bigger role in compensation. "They're totally responsible—like we are as the state—for these damages and for the reinforcement of the houses," he says.

Shell is "fully cooperating" with authorities to shut the field as soon as possible and is "perfectly aware" of its responsibility, spokesperson Tim Kezer wrote in an emailed response to questions. "NAM is responsible for all earthquake-related costs," and it always compensates for earthquake damage and reinforcement necessary for safety, he said. Exxon didn't respond to Bloomberg News' emailed questions on the issue, while NAM declined to comment on its role in compensation and referred queries to Shell and Exxon.

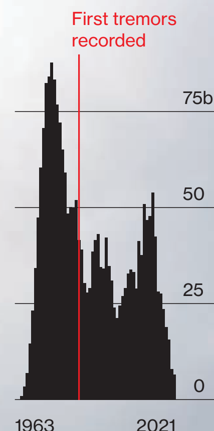
Rather than boosting gas output, the Netherlands has instead removed limits on coal-fired power plants to help ensure energy security, joining other EU members in turning to the heavily polluting fuel. It also doubled import capacity for liquefied natural gas and filled gas storages to ensure they're 80% full before winter.

The situation this winter might be "rather safe," Vijlbrief says, but he's more worried about what will come afterward. "If you would drain these reserves totally because of a cold winter, how are you going to fill them again?" he asks.

Many Groningen residents are bracing for the government to reverse its decision and eventually increase output as pressures mount. "Even if it will kill me, I will continue my fight," Hollaar says. "I have an old dog and an old mum and a broken house. That's all I have to lose." —*Cagan Koc and Diederik Baazil, with Kevin Whitelaw*

THE BOTTOM LINE The Dutch government is caught between keeping promises to earthquake-stricken locals and helping to remedy Europe's gas crisis.

▼ Natural gas production from the Groningen field, in cubic meters




● Groningen

# Why China Is Still The Bubble That Never Pops

● The nation has an unparalleled record of surmounting crises

Is China's economic miracle over? Covid-19 lockdowns, a real estate meltdown, and a crackdown on entrepreneurs add up to a lot of downers. The latest forecasts show growth for 2022 at risk of sliding below 3%, well short of Beijing's 5.5% target. The response from President Xi Jinping and his team so far has been improvised and underwhelming, a stark contrast with the huge government rescue plans in the past.

If China is in for a hard landing, the consequences would be cataclysmic: for the financial system and economy, crisis and recession; for the ruling Communist Party, a shift from legitimacy based on prosperity to control underpinned by repression; for global markets—already reeling from the war in Ukraine and the US Federal Reserve's rate hikes—a shock that rivals 2008's Lehman moment.

Amid the host of potential losers, spare a thought for the author who—in 2020—published a book with the provocative title *China: The Bubble That Never Pops*. I made the case that the country's economic and financial system is more resilient, and its policymakers more ingenious, than critics in Washington and on Wall Street would have you believe.

In the two years since, that thesis has undergone an extreme stress test. Some might say it's failed. In the second edition of my book, I take a different view. Yes, the air is coming out of the China bubble at a faster pace. But no, it's not going to pop.

To explain why, let me start with the pandemic. In September 2020, Xi declared that his country's response "once again proved the superiority of the socialist system with Chinese characteristics." Two years on, with the rest of the world open for business while Chinese cities are still subject to punishing rolling lockdowns, it's China's critics in the West who've succumbed to a similar case of hubris.

Who's right? Certainly, China's pandemic response doesn't look as impressive as it once did. As the chart on the next page shows, lives have been saved, but growth has been sacrificed. Still, don't forget the price other countries paid to recoup a semblance of normal life: a million dead in the US, a million more in Europe. If China had followed a similar path, given its larger population and stretched health-care resources, the numbers could easily have been substantially higher.

Perhaps Covid hasn't revealed the superior crisis-management capacity of free-market democracies over state-controlled autocracies or the reverse, but rather the strengths and weaknesses of each system. The US and Europe couldn't mobilize society to beat back the first waves of the virus, resulting in tremendous loss of life. But they were flexible in adapting policies, and their innovative pharmaceutical makers delivered highly effective vaccines, enabling an early exit from Covid constraints.

China's authoritarian regime didn't balk at imposing restrictions on liberty that saved lives. But the same stifling of dissent that enabled draconian lockdowns made it hard to adjust policies in line with changing circumstances, leaving the country stuck with Covid Zero long after its sell-by date.

China's exit from Covid Zero will render the final verdict. If some combination of less deadly strains of the virus, better vaccines, and effective treatments makes it possible for Beijing to relax its stance without a large loss of life, Xi will be able to claim years of rolling lockdowns were a price worth paying. If not, and China suffers losses comparable to the US, his claim to a superior system will ring doubly hollow.

Let's move on to real estate. For more than a decade, analysts have warned that excesses in borrowing and building have pushed China's property sector onto an unsustainable trajectory. Based on Bloomberg Economics' estimates, the supply of new homes is running about 25% above where it needs to be to meet demand over the coming decade. There are some 2.8 billion square meters of residential real estate sitting empty—enough to house the entire population of Italy.

● Square meters of Chinese residential real estate that's unoccupied

**2.8b**

To their credit, policymakers decided to get ahead of the problem by cutting off sources of financing to overleveraged developers. The consequences are now hitting hard, with property sales and construction tumbling, a slew of defaults from builders, and a mortgage strike that threatens repayment of 1.6 trillion yuan ($245 billion) of loans. China bears—delighted their stopped clock is finally showing the right time—are rushing to declare victory.

Even so, a repeat of Japan's 1989 property meltdown or the US subprime crisis isn't the most likely outcome. The history of China's real estate sector has been a series of exuberant booms and near-disastrous busts. Every time it appears the end is nigh, policymakers have tweaked the dials on down-payment requirements, mortgage rates, and financing for developers to get things back on ▶

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# Chief Future Officer Briefing: The Next Generation CFO

October 25, 2022

**#ChiefFutureOfficer**

Managing the disruptions of today while planning for an uncertain tomorrow. The role of the Chief Financial Officer continues to evolve as conditions warrant hyper responsiveness to changes in the business environment and economy overall. These significant shifts in economic conditions also present opportunities to respond to new demands in revolutionary ways. Mitigating risk remains top of mind while balancing stakeholder priorities.

We will examine how companies and financial leaders adapt to economic volatility and technological innovation, from coping with inflation concerns to emerging technology investment opportunities.

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Chief Financial Officer
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the Digital Economy

**Saurabh Tripathi**
Executive Vice President &
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◀ track. They're doing so again, though this time their goal isn't engineering another boom, but moderating the pace of decline.

It's often noted that real estate accounts for about 30% of China's gross domestic product once all contributions—from building materials to home electronics—are added up. A different way of putting it is that property absorbs, in an inefficient and unsustainable way, 30% of workers and capital. The transition will be painful. But in the end, pointing more of those resources at more productive ends will be positive, not negative, for growth.

How about the "common prosperity" agenda? Xi's campaign to close the gap between China's haves and have-nots has touched every facet of the economy. Tech monopolies such as Alibaba Group Holding Ltd. and Tencent Holdings Ltd. have gotten huge fines. Gig economy platforms were forced to pay workers higher wages. Private tutoring companies were strong-armed into operating as nonprofits.

Critics see those moves as reflecting the pathologies of China's single-party system—paranoid autocrats moving against the entrepreneurs who threaten their control of the economy. Policies that shift income from owners of capital to workers and families will end up stunting growth, they argue, making all Chinese worse off. Reflecting that pessimism, the Nasdaq Golden Dragon China Index, a bellwether for the country's tech sector, has tumbled almost 70% from its February 2021 peak.

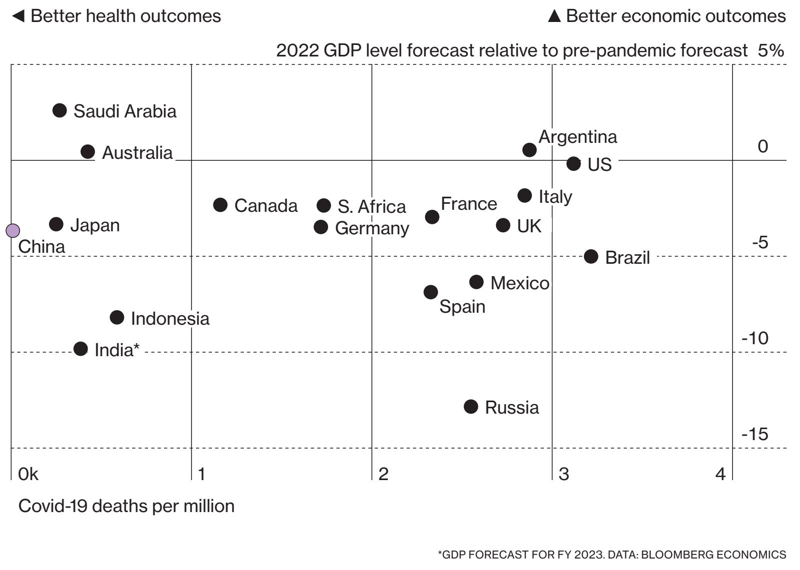
There's another way of looking at it. China has a serious problem with inequality. A chasm in income distribution rivaling those in Latin America and Africa is complicating Beijing's efforts to make progress on important goals such as arresting the rapid decline of the workforce by boosting fertility. A study released this year by a Chinese think tank pegged the cost of raising a child to the age of 18 at 485,000 yuan, or 6.9 times average annual income, a higher proportion than in the US and major European countries. For many low- and middle-income families, that's prohibitively high.

Seen through the prism of those pressing social challenges, it's possible—and maybe even more plausible—to make the case that Xi's common prosperity agenda is grounded in sound public policy, a Chinese authoritarian version of the progressive policies also on the table in the US and Europe.

Make no mistake about it, conditions in China's economy right now are dire. Youth unemployment touched 19.9% in the summer, the highest ever recorded. The flagship CSI 300 equity index is down 23% for the year—more than the S&P 500—even though China's central bank has been cutting

Difficult Choices

China's Covid response has prioritized saving lives over protecting growth




*GDP FORECAST FOR FY 2023. DATA: BLOOMBERG ECONOMICS

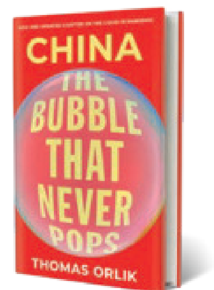
interest rates. Capital outflows have caused the yuan to depreciate against the dollar.

The upside scenario for the years ahead isn't a return to the go-go years but a resumption of steady growth. Demographics, debt, and overcapacity—in real estate and elsewhere—will continue to drag on the economy. The crackdown on the tech titans has soured the entrepreneurial mood at home, and growing tensions with the US have discouraged international investors. In the five years before the Covid crisis, GDP growth averaged about 6.5%; in the next five years, an average of 4.5% would be a win.

Could it be worse? Sure. But remember that bets on the coming collapse of China are hardly new and—so far—haven't paid off. In the early 1990s, Deng Xiaoping's Southern Tour kicked off a post-Tiananmen Square revival of market-opening reforms. In the early 2000s, overhaul of state-owned enterprises, a bailout of major banks, and entry into the World Trade Organization restored growth momentum. In the 2010s, the supply-side reform and deleveraging agendas shut down creaking industrial companies and lowered risk at the banks.

A correct reading of China's history reveals not a country that never encounters crises, but rather a country that frequently encounters and overcomes them. I hope its policymakers do so again. If they don't, the consequences for China's 1.4 billion people, and a world economy that has come to count on this engine of growth, would be catastrophic. Also, I might have to change the title of my book. Ⓑ

*—Tom Orlik is the chief economist of Bloomberg Economics.*

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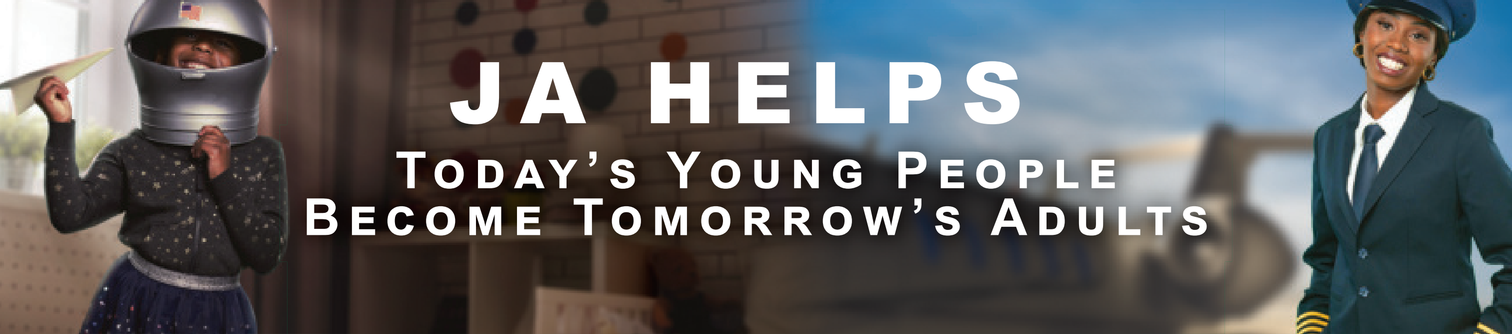

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**October 18, 2022**

What does a post-pandemic model of development look like? How can we create a new middle class that will drive innovation? And what role does the private sector play in creating wealth for all?

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# Small Business

# Organizing Lobstermen

## A union that boosts boat crews' bargaining power offers a model for the gig economy

Lobstering is an inherently individualistic pursuit. Most boats are crewed by just two or three people, and some captains go it alone. They leave harbor before dawn, spend the day hauling traps up from the seafloor, then motor back to the dock to sell the creatures for the best price they can get. It's hard work that draws rugged, self-reliant people—in other words, not your typical union members.

That's what makes Local 207—the only lobstering union in the US—so unusual. The decade-old group in Maine represents about 200 lobstermen (as men and most women in the business call themselves). The union members own three 18-wheel trucks, a pair of smaller vehicles for hauling the crustaceans from wharves, and a so-called tank room—a warehouse packed with tubs of refrigerated ocean water in which the lobsters spend a final few days in something resembling their home environment before reaching their ultimate fate: a quick plunge into a vat of boiling water. "We work for the fisherman," says Jason Rizzitano, manager of the tank room near Bar Harbor.

The lobster union offers a potential model for gig economy workers seeking to push back against large companies that siphon off the bulk of profits in many trades, says Rebecca ▶

PHOTOGRAPHS BY TRISTAN SPINSKI FOR BLOOMBERG BUSINESSWEEK (5)



Edited by David Rocks

From left: Olsen; fishing bibs at a facility in Lamoine; Rizzitano

◀ Lurie, a professor of labor studies at the City University of New York. By working together, such groups have organized Uber drivers, home health-care workers, and cable-internet technicians. Moreover, they can get a big boost from organized labor, which "offers unparalleled support, as well as an air of legitimacy," she says.

The union—more often referred to as "Lobster 207"—got its start after a crash in prices 10 years ago. Although lobster fishing happens year-round, the real season begins in June when the animals shed their hard shells and begin to grow new ones. But in 2012, these "shedders"—prized because they're easier to crack and eat—arrived in May. As the boats started bringing in their catch, few processors had even opened. With lobster piling up on docks, prices fell by more than half, to just $1.80 a pound, devastating any potential profits.

Some lobstermen suggested they could boost prices by not pulling their traps for a while, but the state of Maine threatened a lawsuit: Antitrust regulations bar lobstermen from any collusion such as the proposed work stoppage. David Sullivan, an organizer at the International Association of Machinists and Aerospace Workers, began talking to people on lobster boats about a union—no small feat in a state with a scant tradition of organized labor and where potential members are spread out along a coastline that's longer than California's. "Fishermen are a fiercely independent group," Sullivan says.

He held dozens of meetings in communities up and down the coast, stressing the legal support the Machinists could offer, the political representation it brought, and a program that pays kids' tuition at a pair of local colleges. About 100 people working on lobster boats signed on to the idea even though the union wouldn't be able to collectively bargain, and Lobster 207 was born.

It soon became clear that just having a union wasn't enough to guarantee fatter profits: Because the lobstermen couldn't work together to set prices, they had little leverage at the docks, where private tank rooms typically sell to megabuyers such as Thai Union, Garbo Lobster, and East Coast Seafood. So Lobster 207, guided by the Machinists, decided its members needed to become purchasers of their own product, with a tank room to store it. The union formed a marketing cooperative that would buy the catch from the wharves and sell it to customers, giving lobstermen greater bargaining power. Last year, the cooperative turned a profit for the first time, paying out a dividend. "When the lobster comes in, we get to decide what to do with it," says Curtis Alley, a Lobster 207 member and tank room worker.

Cooperatives are common in Maine fishing, and many own wharves, allowing boat captains to pool purchases of bait and fuel to get better prices. But Lobster 207 says the backing of the Machinists has given it a stronger political voice in the state, helping ease regulations that raise their costs and fighting encroachment from offshore wind farms that disturb fishing grounds. And when local banks balked at lending to the cooperative, the Machinists helped arrange financing with a bank in Kansas. The tank room and trucks for hauling the produce helped the union get better prices and allowed the cooperative to set up a website for selling directly to consumers, which last year booked some $8 million in sales. Virginia Olsen, a Lobster 207 member and fifth-generation lobsterman, says the union hasn't made anyone rich—but it has given fishing communities a sense of stability. "No one is buying a second home," she says. "But it does mean you can dress up and go to Applebee's." —*Robin Kaiser-Schatzlein*

THE BOTTOM LINE After lobster prices crashed, some in the trade suggested a work stoppage to boost prices. When that idea ran afoul of antitrust regulations, the unionization drive gained steam.



ISLA URBANA: PHOTOGRAPHS BY JAKE NAUGHTON FOR BLOOMBERG BUSINESSWEEK. DATA: FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS COMPILED BY WORLD BANK, WATER FROM DOMESTIC SOURCES

# Capturing the Rain in Mexico

Startup Isla Urbana says its technology can address chronic water shortages in cities

Seven hundred years ago, the land where Mexico City now sits was a vast lake that stretched across hundreds of square miles. Over the centuries, as early settlers built homes on dry land and later rulers drained the area to fight seasonal floods, the lake almost disappeared. Today, given the volumes being pumped from the aquifer beneath the ancient lakebed, the metro area of 22 million risks running out of water. The capital is sinking by as much as 20 inches per year, and homes endure frequent shutoffs and periods when what liquid comes out is clouded and smelly.

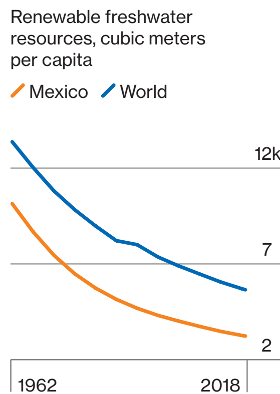
For Enrique Lomnitz, that smelled like opportunity. The Mexico City native and Rhode Island School of Design (RISD) graduate thought he could help households capture the abundant rain that mostly drains out to distant regions rather than replenishing the city's supplies. "We have more rainfall than London," Lomnitz says. "But that doesn't filter down and recharge our aquifer."

In 2009, Lomnitz founded what's now called Isla Urbana (which means Urban Island) to promote a technology he'd devised with fellow RISD designer Renata Fenton. The idea was simple: If you keep the grime from the roof and the dust in the air out of your tanks and let the dirt settle, you can collect rainwater clear enough for mopping or doing laundry. Add more filters and a bit of chlorine, and you can drink it. The goal is "living with the water we have," Lomnitz says, before "we import water or dig deeper for more."

Although rainwater collection isn't new—there are initiatives in Brazil, India, Senegal, and many other places in the developing world—it's typically done in semiarid, rural areas. Isla Urbana started in contaminated cities with limited space in a region with ample rainfall for much of the year. The group has installed almost 30,000 systems and aims to have 100,000 within five years.

The method diverts water from the first few minutes of rainfall—which tends to be dirtier—and then passes the rest through a filter into a tank or underground cistern designed to keep clean water at the top. A pump can shoot it to the rooftop, where it's piped around the house. Lomnitz's team estimated that for $1,000 per home they could cover half of a Mexican family's water use each year. Isla Urbana, which Lomnitz started as a nonprofit and soon expanded with a for-profit arm, has worked in about 20 Mexican states and has deals with three big cities to put subsidized systems in homes.

Eusebio Sergio Jiménez Ávila, who used to work repairing broken water lines, says he can no longer rely on supplies from the city's leaky waterworks, which by some estimates lose more than a third of what flows through them. He lives in the district of Xochimilco, near a network of canals that are home to herons and egrets, as well as small gardens set on artificial islands called *chinampas.* Centuries ago the canals were the area's main thoroughfares, but the city now fills them with treated wastewater because the old sources are drying up. ▶



Lourdes and Eusebio Sergio Jiménez Ávila

◀ The public taps that Jiménez Ávila remembers from his childhood are long gone, and his family sometimes suffers more than a week without running water. So when the local government offered an Isla Urbana system, he signed up. "We get water only two days a week," he says. "When there's none left, we use this."

He and his family use the collected water to wash dishes and clothes, flush toilets, and douse the philodendrons, geraniums, and skinny pines on the patio. Some days, they'll even bathe in it. "I tell the children to take care of the water, because we're going to end up fighting over every puddle," says Jiménez Ávila's wife, Lourdes.

Skeptics of the idea note that the systems don't work in the dry season and that the state should invest in better infrastructure. Cities "think that by financing these kinds of projects, they've resolved the situation," says Nathalie Seguin, coordinator of the advocacy group Freshwater Action Network Mexico. "Rainwater harvesting at the level of a household is a Band-Aid." Lomnitz counters that he isn't promising to supply all the water a city needs but to offer a backup that can reduce strain on public services.

Lomnitz

Adrián Pedrozo Acuña, director of the Mexican Institute of Water Technology, a government research center, says Isla Urbana reflects a shift from massive infrastructure such as aqueducts and tunnels to a more localized approach. Although he acknowledges those smaller systems aren't a full solution, every little bit helps. "The answer has to come from various technologies, based on the needs of each location," he says. "Rainwater capture is one option of many that are part of creating a solution." —*Maya Averbuch*

THE BOTTOM LINE Although rainwater collection has long been used in semiarid, rural regions, Isla Urbana has installed its systems in cities with ample rainfall as it seeks to place 100,000 of them within five years.



# High Fashion At 7,900 Feet

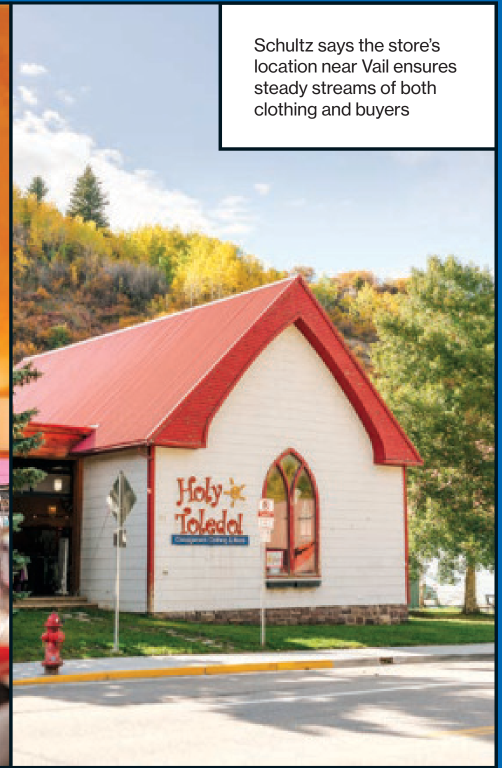
A Colorado secondhand store shows how to serve a global clientele with a local business

Consignment shops have traditionally been hyper-local affairs, taking in old clothing from people cleaning out their closets and selling it to neighbors in search of bargains. But in a town of 1,100 people high in the Colorado Rockies, that equation doesn't quite add up. Holy Toledo, a shop in a deconsecrated Presbyterian church in the old mining town of Minturn, has amassed a database of more than 8,000 consignors that includes residents, tourists, and wealthy second-home owners in the area. "We're a local business with a global reach," says Heather Schultz, the owner.

Location, of course, still matters: Holy Toledo lies 2 miles south of I-70, about halfway between Vail and Beaver Creek. Visitors to those resorts sometimes forsake the heated cobblestone streets to make a pilgrimage to Holy Toledo, where they can find parkas, sweaters, dresses, cowboy boots, and much more. Buyers frequently become suppliers, packing items for sale on their next trip or shipping goods to the store once they get back home—and then telling friends about the place. "There's a snowball effect," says Schultz. "We've been open for 20 years, and we do very little marketing."

While rising costs, supply chain disruptions, and unpredictable demand have plagued many retailers, Holy Toledo is having its best year ever. Revenue is on track to top $1 million, with out-of-towners accounting for more than 60% of sales. It's not unusual for shoppers to spend as much as $1,000 for a high-end ski jacket that retails new for $3,000, but the average price is closer to $100.

PHOTOGRAPHS BY CARMEN CHAN FOR BLOOMBERG BUSINESSWEEK




Schultz says the store's location near Vail ensures steady streams of both clothing and buyers

While the ultrawealthy aren't above "getting a good find"—Prada, Balenciaga, and Jimmy Choo sell quickly—Schultz also stocks plenty of casual clothing such as western wear and yoga pants that she sells at local-friendly prices.

Schultz and her husband, Eric, recognized a couple of decades ago that they couldn't work forever as a ski instructor and patroller. They landed on a consignment shop as a year-round venture—Heather had worked at a nearby second-hand store—and they jumped when the place in Minturn, tucked into a valley 7,900 feet up in the Rockies, went on sale. "It was a no-brainer," she recalls. "We said: 'Let's just buy the real estate, at least we'll have that.'" The store's name, initially suggested as a joke, is a nod to the church and the street where it sits, Toledo Avenue. Early on, Schultz was happy to sell a handful of items daily, but today several hundred is the norm.

Small businesses that serve customers beyond their local area can be a boon to places like Minturn, says Joshua Ross, director of entrepreneurship at the University of Denver. They create jobs and tax revenue, and they bring in outsiders, who frequently patronize nearby businesses and drop in at a local cafe or restaurant for lunch. And those that thrive can create an ecosystem that attracts other entrepreneurs. "It has an invigorating effect on other people and other businesses," Ross says. "It's great for the entire town."

Despite her global customer base, Schultz has virtually no online presence beyond a "really old" website—and there are no plans to change that. She says she has sufficiently high turnover in the shop, and posting goods online would require hiring someone to take photos, write descriptions, and pack and ship anything that sells. Yet she says online marketplaces such as TheRealReal and Poshmark help her determine how much to charge for her goods, especially because she knows shoppers will be comparing Toledo's prices with what they see elsewhere.

When Covid-19 lockdowns eased, Holy Toledo saw a big jump in inventory and buyers. A similar surge occurred in 2008, around the Great Recession, as sinking real estate values prompted second-home purchases by a wave of newcomers whose fortunes hadn't suffered. Many of these people descended on the shop with their fancy duds, spurring a sharp increase in sales. In response, the Schultzes almost doubled the store's size, to about 2,000 square feet.

This time around, Schultz isn't planning another expansion—"more space equals more work," she says. The biggest challenge is handling incoming clothing, with Schultz's team of three part-time employees and a full-time manager evaluating, pricing, and finding the right rack for 1,000 or more items per week. Goods that hang around too long have to be marked down, and after 75 days they're donated to local charities or returned to the consignor. "It is a brutal business when it comes to piecework," Schultz says. "But there's a whole principle of recycling and upcycling in consignment stores. I'm really proud of that." ——*Anna-Louise Jackson*

THE BOTTOM LINE Some shoppers spend $1,000 or more for goods from the likes of Prada, Balenciaga, and Jimmy Choo, but Holy Toledo also carries plenty of more casual clothing at local-friendly prices.

# Self-Driving Cars A

**The $100 billion invested in the driverless-ve**
**according to an emerging consensus of experts**

By Max Chafkin

# Are Going Nowhere

**hicles industry has mostly taken us in circles, s—and the Trump-pardoned guy who invented it**

Illustration by Scott Gelber

The first car woke Jennifer King at 2 a.m. with a loud, high-pitched hum. "It sounded like a hovercraft," she says, and that wasn't the weird part. King lives on a dead-end street at the edge of the Presidio, a 1,500-acre park in San Francisco where through traffic isn't a thing. Outside she saw a white Jaguar SUV backing out of her driveway. It had what looked like a giant fan on its roof—a laser sensor—and bore the logo of Google's driverless car division, Waymo.

She was observing what looked like a glitch in the self-driving software: The car seemed to be using her property to execute a three-point turn. This would've been no biggie, she says, if it had happened once. But dozens of Google cars began doing the exact thing, many times, every single day.

King complained to Google that the cars were driving her nuts, but the K-turns kept coming. Sometimes a few of the SUVs would show up at the same time and form a little line, like an army of zombie driver's-ed students. The whole thing went on for weeks until last October, when King called the local CBS affiliate and a news crew broadcast the scene. "It is kind of funny when you watch it," the report began. "And the neighbors are certainly noticing." Soon after, King's driveway was hers again.

Waymo disputes that its tech failed and said in a statement that its vehicles had been "obeying the same road rules that any car is required to follow." The company, like its peers in Silicon Valley and Detroit, has characterized incidents like this as isolated, potholes on the road to a steering-wheel-free future. Over the course of more than a decade, flashy demos from companies including Google, GM, Ford, Tesla, and Zoox have promised cars capable of piloting themselves through chaotic urban landscapes, on highways, and in extreme weather without any human input or oversight. The companies have suggested they're on the verge of eliminating road fatalities, rush-hour traffic, and parking lots, and of upending the $2 trillion global automotive industry.



It all sounds great until you encounter an actual robo-taxi in the wild. Which is rare: Six years after companies started offering rides in what they've called autonomous cars and almost 20 years after the first self-driving demos, there are vanishingly few such vehicles on the road. And they tend to be confined to a handful of places in the Sun Belt, because they still can't handle weather patterns trickier than Partly Cloudy. State-of-the-art robot cars also struggle with construction, animals, traffic cones, crossing guards, and what the industry calls "unprotected left turns," which most of us would call "left turns."

The industry says its Derek Zoolander problem applies only to lefts that require navigating oncoming traffic. (Great.) It's devoted enormous resources to figuring out left turns, but the work continues. Earlier this year, Cruise LLC—majority-owned by General Motors Corp.—recalled all of its self-driving vehicles after one car's inability to turn left contributed to a crash in San Francisco that injured two people. Aaron McLear, a Cruise spokesman, says the recall "does not impact or change our current on-road operations." Cruise is planning to expand to Austin and Phoenix this year. "We've moved the timeline to the left for what might be the first time in AV history," McLear says.

Cruise didn't release the video of that accident, but there's an entire social media genre featuring self-driving cars that become hopelessly confused. When the results are less serious, they can be funny as hell. In one example, a Waymo car gets so flummoxed by a traffic cone that it flees the technician sent out to rescue it. In another, a small army of modified Chevrolet Bolts shows up at an intersection and simply stops, blocking traffic with a whiff of *Maximum Overdrive*. In a third, a Tesla drives, at very slow speed, straight into the tail of a private jet.

This, it seems, is the best the field can do after investors have bet something like $100 billion, according to a McKinsey & Co. report. While the industry's biggest names continue to project optimism, the emerging consensus is that the world of robotaxis isn't just around the next unprotected left—that we might have to wait decades longer, or an eternity.

"It's a scam," says George Hotz, whose Comma.ai Inc. makes a driver-assistance system similar to Tesla Inc.'s Autopilot. "These companies have squandered tens of billions of dollars." In 2018 analysts put the market value of Waymo LLC, then a subsidiary of Alphabet Inc., at $175 billion. Its most recent funding round gave the company an estimated valuation of $30 billion, roughly the same as Cruise. Aurora Innovation Inc., a startup co-founded by Chris Urmson, Google's former autonomous-vehicle chief, has lost more than 85% since last year and is now worth less than $3 billion. This September a leaked memo from Urmson summed up Aurora's cash-flow struggles and suggested it might have to sell out to a larger company. Many of the industry's most promising efforts have met the same fate in recent years, including Drive.ai, Voyage, Zoox, and Uber's self-driving division. "Long term, I think we will have autonomous vehicles that you and I can buy," says Mike Ramsey, an analyst at market researcher Gartner Inc. "But we're going to be old."

Our driverless future is starting to look so distant that even some of its most fervent believers have turned apostate. Chief among them is Anthony Levandowski, the engineer who more or less created the model for self-driving research and was, for more than a decade, the field's biggest star. Now he's running a startup that's developing autonomous trucks for industrial sites, and he says that for the foreseeable future, that's about as much complexity as any driverless vehicle will be able to handle. "You'd be hard-pressed to find another industry that's invested so many dollars in R&D and that has delivered so little," Levandowski says in an interview. "Forget about profits—what's the combined revenue of all the robo-taxi, robo-truck, robo-whatever companies? Is it a million dollars? Maybe. I think it's more like zero."

In some ways, Levandowski is about as biased a party as anyone could be. His ride on top of the driverless wave ended in ignominy, after he moved from Google to Uber Technologies Inc. and his old bosses sued the crap out of his new ones for, they said, taking proprietary research along with him. The multibillion-dollar lawsuit and federal criminal case got Levandowski fired, forced him into bankruptcy, and ended with his conviction for stealing trade secrets. He only avoided prison thanks to a presidential pardon from Donald Trump.

On the other hand, Levandowski is acknowledged, even by his detractors, as a pioneer in the industry and the person most responsible for turning driverless cars from a science project into something approaching a business. Eighteen years ago he wowed the Pentagon with a kinda-sorta-driverless motorcycle. That project turned into Google's driverless Prius, which pushed dozens of others to start self-driving programs. In 2017, Levandowski founded a religion called the Way of the Future, centered on the idea that AI was becoming downright godlike.

What shattered his faith? He says that in the years after his defenestration from Uber, he began to compare the industry's wild claims to what seemed like an obvious lack of progress with no obvious path forward. "It wasn't a business, it was a hobby," he says. Levandowski maintains that somebody, eventually, will figure out how to reliably get robots to turn left, and all the rest of it. "We're going to get there at some point. But we have such a long way to go."

For the companies that invested billions in the driverless future that was supposed to be around the next corner, "We'll get there when we get there" isn't an acceptable answer. The industry that grew up around Levandowski's ideas can't just reverse course like all those Google cars outside Jennifer King's bedroom. And the companies that bet it all on those ideas might very well be stuck in a dead end.

All self-driving car demos are more or less the same. You ride in the back seat and watch the steering wheel move on its own while a screen shows you what the computer is "seeing." On the display, little red or green boxes hover perfectly over every car, bike, jaywalker, stoplight, etc. you pass. All this input feels subliminal when you're driving your own car, but on a readout that looks like a mix between the POVs of the Terminator and the Predator, it's overwhelming. It makes driving feel a lot more dangerous, like something that might well be better left to machines. The car companies know this, which is why they do it. Amping up the baseline tension of a drive makes their software's screw-ups seem like less of an outlier, and the successes all the more remarkable.

One of the industry's favorite maxims is that humans are terrible drivers. This may seem intuitive to anyone who's taken the Cross Bronx Expressway home during rush hour, but it's not even close to true. Throw a top-of-the-line robot at any difficult driving task, and you'll be lucky if the robot lasts a few seconds before crapping out.

"Humans are really, really good drivers—absurdly good," Hotz says. Traffic deaths are rare, amounting to one person for every 100 million miles or so driven in the US, according to the National Highway Traffic Safety Administration. Even that number makes people seem less capable than they actually are. Fatal accidents are largely caused by reckless behavior—speeding, drunks, texters, and people who fall asleep at the wheel. As a group, school bus drivers are involved in one fatal crash roughly every 500 million miles. Although most of the accidents reported by self-driving cars have been minor, the data suggest that autonomous cars have been involved in accidents more frequently than human-driven ones, with rear-end collisions being especially common. "The problem is that there isn't any test to know if a driverless car is safe to operate," says Ramsey, the Gartner analyst. "It's mostly just anecdotal."

Waymo, the market leader, said last year that it had driven more than 20 million miles over about a decade. That means its cars would have to drive an additional 25 times their total before we'd be able to say, with even a vague sense of certainty, that they cause fewer deaths than bus drivers. The comparison is likely skewed further because the company has done much of its testing in sunny California and Arizona.

For now, here's what we know: Computers can run calculations a lot faster than we can, but they still have no idea how to process many common roadway variables. People driving down a city street with a few pigeons pecking away near the median know (a) that the pigeons will fly away as the car approaches and (b) that drivers behind them also know the pigeons will scatter. Drivers know, without having to think about it, that slamming the brakes wouldn't just be unnecessary—it would be dangerous. So they maintain their speed.

What the smartest self-driving car "sees," on the other hand, is a small obstacle. It doesn't know where the obstacle came from or where it may go, only that the car is supposed to safely avoid obstacles, so it might respond by hitting the brakes. The best-case scenario is a small traffic jam, but braking suddenly could cause the next car coming down the road to rear-end it. Computers deal with their shortcomings through repetition, meaning that if you ▶

**Levandowski at the Mark West Quarry near Santa Rosa, Calif.**

PREVIOUS SPREAD: CARS: TURBOSQUID (2). PHOTOGRAPH BY BALAZS GARDI FOR BLOOMBERG BUSINESSWEEK

◀ showed the same pigeon scenario to a self-driving car enough times, it might figure out how to handle it reliably. But it would likely have no idea how to deal with slightly different pigeons flying a slightly different way.

The industry uses the phrase "deep learning" to describe this process, but that makes it sound more sophisticated than it is. "What deep learning is doing is something similar to memorization," says Gary Marcus, a New York University psychology professor who studies AI and the limits of self-driving vehicles. "It only works if the situations are sufficiently akin."

And the range of these "edge cases," as AI experts call them, is virtually infinite. Think: cars cutting across three lanes of traffic without signaling, or bicyclists doing the same, or a deer ambling alongside the shoulder, or a low-flying plane, or an eagle, or a drone. Even relatively easy driving problems turn out to contain an untold number of variations depending on weather, road conditions, and human behavior. "You think roads are pretty similar from one place to the next," Marcus says. "But the world is a complicated place. Every unprotected left is a little different."

Self-driving companies have fallen back on shortcuts. In lieu of putting more cars on the road for longer, they run simulations inside giant data centers, add those "drives" to their total mile counts, and use them to make claims about safety. Simulations might help with some well-defined scenarios such as left turns, but they can't manufacture edge cases. In the meantime the companies are relying on pesky humans for help navigating higher-order problems. All use remote operators to help vehicles that run into trouble, as well as safety drivers—"autonomous specialists," Waymo calls them—who ride inside some cars to take over if there's a problem.



To Levandowski, who rigged up his first self-driving vehicle in 2004, the most advanced driverless-car companies are all still running what amount to very sophisticated demos. And demos, as he well knows, are misleading by design. "It's an illusion," he says: For every successful demo, there might be dozens of failed ones. And whereas you only need to see a person behind the wheel for a few minutes to judge if they can drive or not, computers don't work that way. If a self-driving car successfully navigates a route, there's no guarantee it can do so the 20th time, or even the second.

In 2008, Levandowski kludged together his first self-driving Prius, which conducted what the industry widely recognizes as the first successful test of an autonomous vehicle. (The event was recorded for posterity on a Discovery Channel show called *Prototype This!*.) Levandowski was aware of how controlled the environment was: The car was given a wide berth on public streets as it made its way from downtown San Francisco across the Bay Bridge and onto Treasure Island, because there was a 16-vehicle motorcade protecting it from other cars and vice versa. The car did scrape a wall on its way off the bridge, yet he says he couldn't help but feel amazed that it had all basically worked. "You saw that, and you were like, 'OK, it's a demo and there are a lot of things to work on,'" he recalls. "But, like, we were almost there. We just needed to make it a little better."

For most of the years since he built his first "Pribot," Levandowski says, it's felt as though he and his competitors were 90% of the way to full-blown robot cars. Executives he later worked with at Google and Uber were all too happy to insist that the science was already there, that his prototypes could already handle any challenge, that all that was left was "going commercial." They threw around wild claims that investors, including the Tesla bull Cathie Wood, built into models to calculate that the industry would be worth trillions.

Once again, this was a bit of self-hypnosis, Levandowski says. The demos with the sci-fi computer vision led him and his colleagues to believe they and their computers were thinking more similarly than they really were. "You see these amazing representations of the 3D world, and you think the computer can see everything and can understand what's going to happen next," he says. "But computers are still really dumb."

In the view of Levandowski and many of the brightest minds in AI, the underlying technology isn't just a few years' worth of refinements away from a resolution. Autonomous driving, they say, needs a fundamental breakthrough that allows computers to quickly use humanlike intuition rather than learning solely by rote. That is to say, Google engineers might spend the rest of their lives puttering around San Francisco and Phoenix without showing that their technology is safer than driving the old-fashioned way.

In some ways the self-driving future seemed closest and most assured in 2017, after Levandowski went to Uber and Google sued them. Google accused Levandowski of taking a work laptop home, downloading its contents, and using that information to jump-start his work at Uber. (Although he doesn't deny the laptop part, he's long disputed that its contents found their way into anything Uber built.) The lawsuit was destabilizing but also validating in a way. Google's $1.8 billion claim for damages suggested it had done the math based on just how imminent the fortunes to be made from driverless technology were. "People were playing for this trillion-dollar prize of automating all transportation," Levandowski says. "And if you think it's really just a year away, you take the gloves off."

Uber had promised to defend Levandowski if he was sued, but it fired him in May 2017, and he faced an arbitration claim in which Google sought to recoup hundreds of millions of dollars. During the 2018 trial, with Google struggling to prove Uber had used its trade secrets, the company settled with Uber. It got about $250 million in Uber stock, a fraction of what it had initially sought, plus a promise that the ride-hailing company wouldn't use Google's driverless technology.

The fallout continued for Levandowski in 2019, when federal prosecutors announced that a grand jury had indicted him on 33 counts of trade secrets theft. Soon after, the deal his new company, Pronto.ai, had been negotiating with a truck manufacturer—to try out Pronto's more modest driver-assist feature for trucks—fell apart. "It turns out a federal indictment does cramp your style," he says. An arbitration panel also ordered him to pay Google $179 million. He stepped down as Pronto's

## “You think the computer can see everything and can understand what’s going to happen next. But computers are still really dumb”

chief executive officer, turned the company over to its chief safety officer, Robbie Miller, and declared bankruptcy. As part of a deal with prosecutors, in exchange for the dismissal of the other 32 counts, Levandowski pleaded guilty to one and was sentenced to 18 months in federal prison in August 2020. Because of the pandemic, the sentence was delayed long enough that he never served a day before his pardon, which came on the last day of the Trump presidency.

According to a White House press release at the time, the pardon’s advocates included Trump megadonor Peter Thiel and a half-dozen Thiel allies, including Arizona Senate candidate Blake Masters and Oculus founder Palmer Luckey. Levandowski says that he and Thiel have some mutual friends who spoke up for him but that they never talked until after the pardon was announced. He says he doesn’t know why Thiel took up his cause, but Thiel’s antipathy for Google is legendary, and pardoning Levandowski would’ve been an opportunity to stick a thumb in the company’s eye. Earlier this year, Levandowski reached a settlement with Uber and Google over the $179 million judgment that will allow him to emerge from bankruptcy.

The idea that the secret to self-driving was hidden on Levandowski’s laptop has come to seem less credible over time. A year after Uber fired him, one of its self-driving cars killed a pedestrian in Phoenix. (The safety driver was charged with negligent homicide and has pleaded not guilty; Uber suspended testing on public roads and added additional safety measures before resuming testing. The company was never charged.) Uber sold its self-driving unit to Aurora, the now-struggling upstart, in 2020, when times were better. In September, Waymo claimed, based on the results of a simulation, that its vehicles are safer in some circumstances than humans. Back in the real world, the safety figures are much less conclusive, and Waymo is basically where it was five years ago. (Waymo disputes this.)

Levandowski says his skepticism of the industry started around 2018. It was a little more than a year after Elon Musk unveiled a demo of a Tesla driving itself to the tune of *Paint It Black*. Levandowski checked the official road-test data that Tesla submitted to California regulators. The figures showed that, in that time, the number of autonomous miles Tesla had driven on public roads in the state totaled—wait for it—zero. (Tesla hasn’t reported any autonomous miles traveled in California since 2019. The company didn’t respond to a request for comment.) Although Levandowski says he admires Tesla, is impressed by its driver-assistance technology, and believes it may one day produce a truly self-driving car, he says the lack of progress by Musk and his peers forced him to question the point of his own years in the field. “Why are we driving around, testing technology and creating additional risks, without actually delivering anything of value?” he asks.

While Tesla has argued that its current system represents a working prototype, Musk has continued to blur the lines between demos and reality. On Sept. 30 he unveiled what looked like a barely functional robot, promising it would unleash “a fundamental transformation of civilization as we know it.” Six years after it began selling “full self-driving” capabilities, Tesla has yet to deliver a driverless car. Levandowski, for his part, has been spending time in gravel pits.

For more than 100 years, mining companies have been blasting rocks out of the hills near Santa Rosa, Calif., and crushing them into gravel bound for driveways, roads, and drains. Levandowski sometimes refers to Mark West Quarry, where Pronto has been operating its driverless trucks since last December, as a “sandbox,” and it’s easy to see why. The dusty mine features life-size versions of the Tonka toys you’d find in a child’s playroom. Yellow excavators knock enormous boulders down from a terraced cliffside into the mining pit, where front-end loaders pick up the stones and place them in 50-ton dump trucks to be carried to the crusher. “An 8-year-old boy’s dream,” Levandowski says as the boulders rattle through the crusher, which spits the smaller pieces out onto piles.

The mine work started as a sort of backup plan—a way to bring in revenue while Pronto got trucking companies comfortable with using its driver-assistance technology in their long-haul semis. Now, Levandowski says, construction sites are Plan A. Pronto took the same basic system it had used on the semis and built it into a self-driving dump truck, adding cameras, radar, and an onboard computer. Because connectivity is spotty at mine sites, the company created its own networking technology, which it spun off as a separate company, Pollen Mobile LLC. “With mining we’re doing driverless, but controlling the environment,” says Pronto Chief Technology Officer Cat Culkin. BoDean Co., the company that owns Mark West Quarry, is one of a half-dozen clients that pay installation fees to retrofit dump trucks with sensors, plus hourly fees for use. Neither Levandowski nor BoDean will say how much Pronto charges or how much it’s taking in.

Here’s his new vision of the self-driving future: For nine-ish hours each day, two modified Bell articulated end-dumps take turns driving the 200 yards from the pit to the crusher. The road is rutted, steep, narrow, requiring the trucks to nearly scrape the cliff wall as they rattle down the roller-coaster-like grade. But it’s the same exact trip every time, with no edge cases—no rush hour, no school crossings, no daredevil scooter drivers—and instead of executing an awkward multipoint turn before dumping their loads, the robot trucks back up the hill in reverse, speeding each truck’s reloading. Anthony Boyle, BoDean’s director of production, says the Pronto trucks save four to five hours of labor a day, freeing up drivers to take over loaders and excavators. Otherwise, he says, nothing has changed. “It’s just yellow equipment doing its thing, and you stay out of its way.”

Levandowski recognizes that making rock quarries a little more efficient is a bit of a comedown from his dreams of giant fleets of robotic cars. His company plans to start selling its software for long-haul trucks in 2023. And hopefully, in a few decades, all his old boasts will come true: driverless cities with cushy commutes, zero road fatalities, and totally safe road naps. But for now: “I want to do something that’s real, even if that means scaling back the grandiose visions.” B

# HOMEBUY

# YER HELL

## A growing number of hackers are intercepting people's down payments as they purchase a new home

By Natalie Wong



For weeks, the Secret Service agent had been trying to identify the scammers moving millions of stolen dollars through banks around the New York tri-state area. His quest had begun on a quiet afternoon in May 2020, when the streets of New York were still mostly empty. Cases were moving slowly, and legal processes were delayed. The agent was restless, trying to keep busy during what he thought would be a short-lived pandemic.

Sitting in his office, in a gray tower near the Brooklyn Bridge, the agent, whom we'll call Alex (he asked to protect his identity because of the undercover nature of his job), started the routine process of scouring a government database called the Internet Crime Complaint Center. The IC3, as the database is known, is accessible to all domestic law enforcement agencies and spans more than two dozen types of crimes, including credit card frauds, ransomware attacks, and identity thefts. Last year it received an average of more than 2,300 cybercrime complaints a day, about one every 37 seconds. Alex was looking for business email compromises, or BECs, a type of scam where hackers infiltrate corporate accounts to send fake wire requests, such as an invoice or a contract payment.

BEC scams indiscriminately target all types of industries, but over the past few years they've found a new kind of victim: the eager homebuyer. Individuals and couples who, anxious to close on their dream home and inundated with paperwork and emails, think they're transferring their down payment to a title company or a lawyer handling the closing process. Instead—by missing an impossibly subtle detail in an email, such as a spelling error or an extra character, indicating it's a fake—they mistakenly wire tens or hundreds of thousands of dollars to a hacker. ▶

◀ In a single moment, they're losing their entire nest egg, along with the home they thought they were about to move into, with little chance of ever getting the money back. "I was shellshocked for a couple of days. I just didn't sleep," says Christopher Garris, a 35-year-old assistant professor who lost almost $150,000 in 2021 when he tried to buy a condo in Boston after landing a position at Harvard. "It caused problems between my wife and I, and it caused a lot of stress. Having lost considerable money we saved for a long time—it's been a big source of anxiety for us."

Alex, whose work focuses on BEC crimes, was on a case that required him to screen complaints logged in the IC3 in his geographic area. He noticed an attempted hack on a construction company in Long Island, in which thieves tried to steal $30,000 by sending fake statement claims. By heist standards, it was a minuscule amount that most agencies wouldn't have bothered to investigate. But a newly attempted hack can reveal fresh clues that the culprit might have been left behind, potentially opening doors to other cases.

There are several ways to try to locate the person behind a BEC scam: email or internet addresses, bank accounts where the money is wired, and phone numbers, to name a few. Alex did a wider database search to see if other complaints had indicators matching the $30,000 hack attempt. There were plenty. It ended up leading to more than $9 million worth of stolen funds affecting 50-plus victims across different sectors, with real estate losses amounting to more than $2 million, according to a source familiar with the matter who asked not to be named because of the confidential nature of the case. The tens of thousands "may not seem like a lot of money to the government or attorney's office, but if I lost it, I'd be really upset," Alex says. "That's a lot of money to me."

BEC scammers typically engage in what Alex calls a shotgun approach. They compile contact information for random players involved in any real estate transaction—lawyers, brokers, title agencies, mortgage lenders—then send mass phishing emails to this database, waiting for someone to take the bait. In the email, the scammers might provide a link that leads to a website resembling the real estate agent or title company's email login page. The duped individual will type out their credentials, which might lead to an error page. Most think nothing of it—perhaps it was merely an internet connection problem. They don't realize they've sent their login information to the hacker, who now has access to their email and confidential company information. Critically, they are also able to track conversations about impending home sales with buyers, ultimately zeroing in on the specific deals they want to infiltrate.

That's the easy part. What follows is complex social engineering, in which the scammers monitor correspondence about a specific transaction for months. Without tipping off anyone, they learn the minute details of a deal. When it becomes apparent that a down payment is about to be wired, they jump in with a fraudulent email to the buyer, pretending to give official instructions from the real estate or title agent: Please wire your money to this bank account. The email can be sent from the compromised account or from a fake one that looks almost identical to that of the agent in the deal. The unsuspecting buyer wires their life savings to a criminal.

Reports about this alarming scheme exploded during the pandemic, when home prices, bidding wars, and cash deals all rose. As transaction volume swelled, so did profits for real estate companies, lenders, and banks, and hackers smelled a growing opportunity. By targeting escrow wires, scammers are able to single out a particularly easy jackpot, a transaction involving multiple parties without proper internet security and the rare instance in which a giant sum of cash is sent in a single wire. In 2020 and 2021 the FBI labeled BECs the costliest cyberthreat, accounting for reported losses of $4.2 billion, with real estate wire fraud becoming one of the most targeted sectors. "Those numbers are floors, not ceilings," says Crane Hassold, director of threat intelligence at Abnormal Security, an email security company. "There's a lot that doesn't get reported."

Secret Service agents in the Global Investigative Operations Center in D.C.

BECs were already a growing problem in 2017, when the Secret Service started the Global Investigative Operations Center (GIOC) as a pilot project aiming to tackle cybercrime. Historically, different government agencies including the Secret Service, the FBI, Homeland Security, the IRS, and state and local law

“If we don’t get to it [the stolen down payment] within about 36 hours, it’s pretty much gone”

enforcement independently tackled cybersecurity cases. But agents would find themselves tracking small deals that led nowhere, only to find out much later that they overlapped with others. The GIOC, which became operational later that year, would be a coordination center that could streamline reports and investigations as cyberfraud grew more sophisticated and frequent. As a bonus, it was also a chance for the Secret Service to finally gain more respect as a formidable agency fighting financial criminals, a label usually enjoyed by their far larger and better-funded peers at the FBI.

Agents working at the Secret Service headquarters, located in a bland brick office building in downtown Washington, are quick to tout the agency’s lineage. It was founded in 1865 as a branch of the US Department of Treasury to combat currency counterfeiting; by the end of the Civil War almost a third of all currency in circulation was fake. The Secret Service was only tasked with guarding the president after William McKinley’s assassination in 1901. It’s still responsible for investigating financial crimes including counterfeiting, identity theft, and other felonies against federally insured financial institutions.

In 2019 the GIOC formalized a small team of BEC-focused agents, a few of whom, including Alex, relocated from New York to Washington in the past few years. So far it’s helped recover more than $244 million in stolen BEC funds, of which roughly a third is from real estate deals.

In a BEC scam, after a homebuyer realizes what’s happened—which usually takes a few days—they reach out to their bank, title agency, local law enforcement, or a private cybersecurity company and are often told to file an IC3 complaint. As soon as GIOC agents have the file, it becomes a race against time: The agents inform their contacts at various banks, credit unions, crypto exchanges, and other government agencies to freeze and recall the money before it’s cashed out or moved abroad, where it’s far harder to trace. Every minute that passes reduces the odds they’ll be able to recoup the stolen funds. “If we don’t get to it within about 36 hours, it’s pretty much gone,” Alex says. “These guys know how quickly we try to work, and they know they need to get the money out now.”

The same month Alex began trying to track down the scammers, Danny Gonzales was planning to celebrate his wedding anniversary. Pandemic shutdowns meant Gonzales and his wife couldn’t go out to a fancy restaurant or hotel to toast eight years of marriage, but they’d mark it with another momentous occasion: closing on a new home.

Two months earlier, Gonzales had decided to move his family from San Antonio to the Austin area. He wanted to live in a neighborhood near a hockey rink and a dual-language elementary school for his young sons. He also had a daughter from a previous marriage, and moving would bring him closer to her. The house they found, a four-bedroom on 1.5-acres, had been on the market only for a day before the Gonzaleses went to look at it. As they were finishing their tour, they saw several other interested buyers waiting outside, so they submitted their bid two hours later. Luckily the seller accepted their offer quickly.

Over the following weeks, Gonzales and his wife dealt with a flood of emails about the transaction. A few days before closing, they received an email that appeared to be from the title agent, with the closing cost and instructions to wire. Because of Covid-19 restrictions at banks, the message read, some funds were taking longer to process. Would they kindly wire the $123,500 three days in advance of the closing date to ensure there would be no delays? Gonzales called the agent’s number provided in the email to confirm but received an immediate text back saying they were busy with another client and to email any questions. On the Tuesday before closing, Gonzales emailed his bank instructions to wire the money. As is standard protocol, the teller asked him to verify the New Jersey Chase Bank account number he was transferring to and the amount. He confirmed. The money went through.

On Friday, Gonzales received a call from his title agent confirming the closing appointment that day and reminded him to bring a cashier’s check for the down payment. Gonzales was confused and said he’d already wired the money she’d requested by email a few days earlier. The agent paused. She never sent any email about wiring money. He read the email to her, including the email address. Sure enough, it looked identical to hers, except for an “e” that was changed to a “c” and that it was sent from a Gmail account, which wasn’t visible on his mobile phone. “My heart dropped,” Gonzales says. “I felt a sudden rush. It was a weird experience, like, ‘This cannot be happening. It’s not real.’ ”

The agent told him he’d likely been scammed. When Gonzales hung up the phone, he had to tell his wife that he’d just wired their down payment to hackers—the same ones, he’d later discover, Alex was trying to hunt down. Her face went white. His agent told him to immediately contact law enforcement and report his case. He tried to call Chase, where he’d wired the money, but they wouldn’t give him any information or freeze the account the money was wired to. He called the president of his own bank, a smaller institution where he’s been a client for decades, but was told that they could recall the money only on Monday, because it was Friday afternoon and the Federal Reserve was already closed. He contacted the sheriff of his county, a detective in New Jersey, and the Secret Service, but by the time they were able to look into the receiving account, all the funds were gone.

Gonzales would have to sit tight until Monday. Passing that time was painful. He couldn’t sleep. His emotions ranged from helplessness to anger, disappointment to guilt. How could he be so gullible? Were there signs he missed? He knew now that the email address was off, but no one had warned him to check. Nothing seemed amiss in the message—the font, signature, and numbers were all accurate.

Then he remembered something odd about his interaction with the title agent the day he found out about the hack. She ▶



PREVIOUS SPREAD: PHOTO ILLUSTRATION BY 731; HOUSE: GETTY IMAGES; DOLLAR SIGN: ALAMY. PHOTOGRAPH BY GREG KHAN FOR BLOOMBERGBUSINESSWEEK

◀ didn't seem surprised. In fact, she told him that a year earlier, the same thing happened to another client who never retrieved their stolen funds. Right after, she made a point to ask him to read a tiny disclaimer at the very bottom of her email that says never to respond to instructions to wire money by email. Gonzales was incredulous. He might have read that the first time she emailed him but never again. If this was such a rampant scam, why didn't they emphasize the risk? "They were already aware about this hack," he says. "But they didn't warn me."

A BEC is typically coordinated by a loose network of perps: the hackers, who gain access into a company or individual's network; money mules, who (sometimes unwittingly) open accounts to launder money on behalf of the hackers; and the orchestrators of the entire scheme, who control the international bank accounts accepting these transfers.

Many cases the GIOC team investigated lead back to West Africa, but the geographic footprint keeps expanding. Other criminals have "seen how lucrative BEC is–it averages about $150,000 per incident right now–so we have groups that are all over the world," says GIOC agent Stephen Dougherty. Many fraudsters are also working as part of global crime syndicates, which are hard to dismantle because of the sheer number of actors involved. Even if a group is taken down, the low barrier to entry means new ones are constantly popping up. "It's not a problem that can be effectively mitigated solely through arresting people," says Abnormal Security's Hassold. "You could arrest dozens, hundreds of these guys, and frankly, you wouldn't make much of an impact in the day-to-day BEC volume."



The allure of BECs is irresistible for those looking for fast cash. One money mule Alex caught said he fell into it after meeting a man at a nightclub who was casually throwing around $100 bills. Curious, he asked the flashy individual how he made his money, and the guy offered him a job on the spot. He accepted, and eventually his wife became a money mule, too. Now they're both in a California prison.

*Bloomberg Businessweek* spoke with reformed hackers from Nigeria who asked for anonymity out of fear of imprisonment or retribution from crime syndicates. Hackers often get involved with BEC groups at a young age, 11 to 18, when, either fresh out of primary or secondary school, they're facing some of the highest unemployment rates worldwide for young men. They might get involved for a variety of reasons: peer pressure, the promise of fast money, or, for many impressionable boys, pure curiosity. And the rewards often outweigh the possibility of being caught by law enforcement. "With the economic situation in the country, I don't think people mind the risk anymore," says one of the reformed hackers, who says he's since become a cybersecurity consultant. "So the community is still growing despite the risk growing."

Hacking victim Danny Gonzales and his wife, Shelley, in Leander, Texas

The Gonzales case in Texas would eventually end up in the Secret Service's files. (Although the agency declined to disclose details about specific cases, people familiar with those details did.) The New Jersey account Gonzales had wired the money to belonged to one of the money mules Alex had been tracking. Once he found enough overlapping evidence across various complaints, he recruited his colleague, Claire, to help him. (Claire's name has also been changed to protect her identity because of the undercover nature of her job.)

Together, the agents conducted dozens of interviews with traumatized victims from all over the country, listening for clues. It was emotionally exhausting. Claire called one couple who'd just sold their home and were driving in a U-Haul to their new one in Wyoming. She had to break the news that the $400,000 they'd wired to close on the house had gone directly into a fraudster's account. "I still remember the panic in their voice, knowing they were homeless," she says.

The rare moments when the Secret Service was actually able to intercept a hack, it wasn't uncommon for the agents to find themselves having to convince victims that they weren't the fraudsters. One Christmas, agent Dougherty was huddled in the basement at his in-laws' house, avoiding holiday togetherness, when he saw a complaint come in for a missing $13,000. He immediately contacted the receiving bank, and as they looked into the account where the money had been deposited, an additional $350,000 suddenly appeared. "We were able to locate the victim, and I'm cold-calling them asking if they sent the $350,000 wire," Dougherty says. "They thought I was scamming them." He reassured the victim he was a government agent, offering to FaceTime and suggesting they call another agent to confirm. They ended up looking him up, and Dougherty was able to recoup all the money. "If we hadn't looked at the smaller one, we wouldn't have caught the bigger one," he says.

After victims wire funds to a fraudster's account, the money launderers break up the wire quickly to evade authorities, starting with domestic accounts and eventually moving it to

PHOTOGRAPH BY ANTHONY FRANCIS FOR BLOOMBERG BUSINESSWEEK

a foreign account or crypto wallets. In some cases they cash it out and park it in physical property such as real estate or jewelry. Alex and Claire, who along with the Secret Service, declined to share details about this case, monitored this type of movement to track other criminals involved. As they studied bank transaction statements and analyzed personal information used to open the accounts, similar details emerged, including IP addresses, account logins, emails, and call detail records.

It still took weeks to physically locate the criminals. Many used aliases to create passports from all over the world–Benin, Ghana, Malta, South Africa, the UK–that were then used to open accounts across major banks operating in New York and New Jersey, a disturbingly easy feat. Even after monitoring hours of video surveillance, it was hard to identify the culprits, who were typically wearing pandemic face masks like everyone else at the time.

After several months, the agents spotted their first target, a Nigerian woman in her mid-20s wearing a bright pink Nike cap, purchasing a cashier's check–a quick way to cash out the freshly transfered money–at a bank branch in Brooklyn. They were finally able to put a face to the person attempting to receive the stolen money they'd been tracking. The agents continued seeing "Pink Hat Girl," as they nicknamed her, pop up at different banks, where she used more than a half-dozen different names. Eventually they identified her as Oluwadamilola Akinpelu, her license plate ultimately giving her away.

Once they had Akinpelu, it became easier to track other members of the laundering ring who visited each other's apartments and used each other's cars. One day, as the agents were staking out a Brooklyn brownstone where an elderly victim had mailed a check, they almost ran into Akinpelu. She was getting out of her Uber right next to their car to visit Adedayo John, whom they would soon discover was a key part of the ring.

The agents spent weeks following members of the money mule network around the New York area, watching them move cash among banks and buy designer clothes, tech gadgets, and cars, which it seemed the crew couldn't get enough of. Akinpelu had just bought a brand-new Mercedes-Benz, and John had a Mercedes, a Land Rover, and a Lexus. Alex and Claire continued logging every move. "There were a lot of long days," Alex says.

At about 6 a.m. on Oct 13, 2021, while it was still dark out, Alex, along with 15 other Secret Service agents and New York police officers, rushed into John's two-bedroom apartment in Brownsville, Brooklyn, seizing his cellphones and multiple computers. In Far Rockaway, Queens, officials moved to arrest Akinpelu. Both of the money mules' closets flaunted Gucci and Louis Vuitton clothes.

Later that afternoon, the Southern District of New York announced federal felony charges against a total of 11 members of the money laundering ring. John and his counterparts are awaiting trial or plea hearings, charged with conspiracy to commit bank fraud and money laundering; they face a maximum sentence of 30 years in prison. Although authorities were able to freeze their accounts and seize physical properties, such as phones and cars, other goods were already out of reach. One fraudster used her money to purchase the equivalent of a subdivision back home in Nigeria. She still owns that land, and the agents haven't had much luck working with the Nigerian government to seize it.

Even though Alex didn't have a lot of sympathy for the perpetrators, it struck him how willing they'd been to take such a big risk. They were only middlemen. They didn't live in fancy homes. A few of them stated that they worked as ride-share drivers. He'd spent more than a year tracking them, learning everything there was to know about their ways and the damage they caused. During the arrests, which Alex declined to speak about in detail, he was excited to finally meet them. Surprisingly, the culprits, many of whom were around his age, didn't seem shocked or hostile and were even willing to chat with him for a while. "Any time I finish something like this, it's always a sense of relief," Alex says of the sting. "It's like, wow, I feel like I know everything about you. I know you better than people I've known my entire life." The investigation is still ongoing to determine who the fraudsters were working for abroad.

As for homebuyers, they're still largely on their own. *Businessweek* spoke with roughly a dozen victims who all claimed that no one at the real estate firm, title firm, or bank provided adequate warnings about the high risk of fraud. For the most part, the companies involved in real estate transactions are well-insulated from legal recourse. Real estate firms usually have a boilerplate warning about fraud in their emails but don't mention it otherwise. Some even skirt their own rules by sending confidential information over unsecure accounts during negotiations and closings. "It's very easy to prevent if you just adequately warn people about it," says Ian Hicks, a lawyer who represents victims of wire fraud. "But there is a difference between truly trying to warn someone vs. trying to cover yourself legally and having a blank warning in place."

Banks, meanwhile, are covered by clauses in wire transfers, which often protect the bank from having to notify consumers of potential irregularities. These waivers might also include arbitration clauses, which largely protect it from lawsuits, something a financially devastated client can rarely afford to pursue anyway. "There is a big role banks could play that they're not playing now," Hicks says.

Gonzales ended up being one of the few lucky ones. The Secret Service recovered about $27,000 of the stolen $123,500, and he was able to get a loan from his mother to purchase the home he almost lost. Meanwhile, Garris, the professor, hired Hicks earlier this year and is planning to sue his real estate agent, closing attorney, and their employers. The NYPD told Garris that the funds he'd lost in 2021 had been converted to cryptocurrency and traced to an account in Nigeria. He hasn't recovered any money. "Every one of these cases is a heartbreaking Dickensian nightmare," Hicks says. "There's never a situation where it's not complete emotional and financial devastation." —*With William Turton and Max Abelson*

bang
BRAIN AND BODY FUEL

# ‘I Am ENERGY’

## Jack Owoc—entrepreneur, frequent litigant, Florida Man—didn’t just invent the energy drink Bang, he embodies it. Now his caffeine empire is teetering

By Anders Melin

Illustration by Giacomo “twopixx” Sforza



**The applause had died down by the time Jack Owoc** mounted the stage in a Manhattan conference venue in June, a microphone in one hand, an energy shot in the other. He moved in to fist-bump the outstretched palm of the moderator, then sidestepped him. Four hundred pairs of eyes surveyed the billionaire. He wore a shiny Renaissance-meets-Miami-nightclub blazer, an even shinier button-up, New Balance sneakers, and a joyless expression. Slung around his neck were two thick gold chains, and on his chest rested a big, bedazzled lowercase B—the logo of his company, Bang Energy. Through his veins coursed the caffeine equivalent of about nine cups of coffee.

“God bless you guys,” Owoc said. “Look, we’ve got to take this up a notch so can I ask everybody to stand up, please, because this is Bang Energy, I exude energy, I am energy.”

He flashed a faint smile. A handful of people clapped. One lone voice hollered.

“I need you to take out your Bang and take a sip because we got to get up the energy level in here,” Owoc said. He motioned to the crowd. By their feet were 16-ounce cans of Bang: the source of Owoc’s fortune and perhaps the most improbable success story in the beverage industry. Each has enough caffeine to make a heart race an entire afternoon.

“Let’s all have a Bang together,” Owoc said and took a swig from his shot.

Ninety seconds later—after he’d twice declined the moderator’s invitation to sit down; run through the salad days of his soaring, and now stagnating, company; and disparaged two rival energy drinks—the moderator cut him off. “Can we go from the stage to the chair?” he asked in the tone of a parent dealing with a difficult but amusing child.

Owoc, who’s 61, shook his head.

“No, we cannot do that. I’ve got too much energy. This is Bang”—he raised his right arm to the sky—“we’re bringing the Bang! Who wants to bring the Bang?”

Laughter filled the air, and Owoc, who’d nervously paced backstage an hour earlier, seemed to relax a bit. This was supposed to be a normal Q&A at an industry conference organized by the trade publication *BevNET*, but the owner of Bang Energy plays by nobody’s rules except his own. After all, his is the brand that came from nowhere and shot past $1 billion in annual sales, put a scare into Red Bull and Monster, and turned this man from Miami into a glitzy, hyped-up cross of business, Bible verses, science, sex appeal, and cocksure ostentation.

“I didn’t know there was someone who could look more like he founded Bang Energy,” comedian Morgan Leinwohl ▶

◀ once remarked, "but somehow this guy's done it. Jack is if Florida was a person."

Over the next half-hour, as Owoc strutted back and forth onstage, sermonizing like a televangelist, the moderator peppered him with questions about the storms ahead. Key among them: What about Bang's soured distribution deal with PepsiCo Inc., which threatens the whole business? And what about the recent court ruling that Bang must pay a royalty on all future US sales to none other than Monster Beverage Corp., its archrival?

Owoc responded sometimes jokingly, sometimes not at all. "God created you very special," he told the audience in one of several words-of-wisdom interludes. "Be yourself; if you try to be someone else, you will eventually fail."

Later that day, after Owoc had left, the venue was abuzz with different versions of the same bewildered questions: The garb, the gold, the preachy tirades—is it just a show? Or is this who Jack Owoc is?

Ask those who know him, and you'll get what-can-I-tell-you smiles and shrugs: Jack is Jack. The obstinacy and self-belief he displayed on that stage are what fueled his rise. But the trouble keeps coming: Sales have been falling, and on Sept. 29 a federal jury ordered Bang to pay Monster an additional $293 million for deliberately making false advertising claims. It remains to be seen whether Owoc's old methods are enough to meet new challenges.



**Starting an energy drink company is a hopeless endeavor.** Water, coffee, tea, juice, milk, and alcohol account for 85% of what the average American adult drinks on a given day. Legions of companies fight for the remainder. Energy drinks face yet another hurdle: Most people can take only so much caffeine.

Since Red Bull landed on US soil a quarter-century ago, more than 1,500 rival brands have been introduced here. Most don't exist anymore. It's hard to entice investors. Products fight for limited shelf space in stores. And industry veterans say most new drinks simply aren't novel or particularly good.

This bleak backdrop makes Bang's success all the more remarkable. Sure, 2 out of 3 energy drinks sold in the US are either a Monster or a Red Bull. But Bang has third place in the $18 billion-a-year market. Many applaud Owoc for breaking through and for bringing flavors into a category that for a long time lacked variety. If you want Radical Skadattle, Rainbow Unicorn, or Wyldin' Watermelon, there's only one place to get them.

**As Bang took off, Owoc began one of the stranger transformations in the annals of America's super rich**

Is Owoc a business genius? Bang didn't answer questions or respond to numerous requests for comment for this story. But more than two dozen people who spoke with *Bloomberg Businessweek* said the answer to that question is complicated. It's clear that Owoc has a keen instinct for product development and is a tenacious negotiator. He's hired many people from established beverage giants to organize Bang's sales and distribution. On good days this is a potent combination, and it's helped propel Owoc's net worth to about $3 billion, according to the Bloomberg Billionaires Index.

Then there's the side of him that few want to speak about on the record: the mercurial emperor who oscillates between paternal benevolence and erratic ruthlessness. Bang has no board of directors or outside investors. Owoc answers to no one. And he can be dangerous to cross. He recently spent millions of dollars suing four former Bang employees for breaching their noncompete agreements. One of them, who admitted to some of Owoc's allegations, agreed to never work in the industry again. Two others, who settled without admitting wrongdoing, each owe Bang more than $1 million in fees and damages. The last one had his case stayed after he filed for personal bankruptcy in July.

Owoc is known to fire people public-execution-style, using email and copying scores of other employees. According to court records, he once accused his general counsel of racketeering and embezzlement and later explained the attorney's termination in a memo: "Tomfoolery was at an all-time high and we had no choice except to excise the cancer and get it out of our organization before it metastasized and killed the host!" The attorney is now suing Owoc for libel. He declined to comment for this story because the matter is pending.

These days, Owoc rarely shows up at Bang's office in Weston, Fla., before late afternoon, if at all. He mostly rules his kingdom from his $7.7 million home, where executives come for evening audiences that sometimes stretch into the night. As Owoc once told one of them, "The king doesn't come to you. You come to the king."

**A few hours before his boss arrived at the conference,** Gene Bukovi walked into the hall. He chatted with the young women at Bang's exhibition booth—Bang Girls, in the company's parlance—then spotted a couple of old business partners. The men shook hands.

"I've been trying to avoid this guy," Bukovi said and nodded at a *Businessweek* reporter standing nearby, whose calls and texts he'd ignored. He then proceeded to talk for an hour.

Bukovi plays a nebulous but central role at Bang Energy. On paper he's executive vice president for sales. Others say he's more like Owoc's consigliere. The two were born a year apart in the early 1960s and grew up in the same area, between Miami and Fort Lauderdale. They played basketball on the same courts and sat in the same church on Sundays. As young adults, they connected in the gym.

Trace the roots of Bang Energy, and you'll eventually end up at a handful of Miami gyms that drew the local elite of powerlifters and bodybuilders in the '80s. Foremost among them was the Apollo, a dungeonlike venue that also was a base for the city's underworld, where whispers of drug deals, extortion,

JEENAH MOON/BLOOMBERG

Owoc at an industry conference in June

loan-sharking, and even killings wafted through the sticky air. Steroids were still legal and were widely used at the Apollo. A former staff member recalls lifting a ceiling tile in the men's bathroom and finding hundreds of used syringes.

Owoc had taken up weightlifting in high school, after a girl told him he was too skinny for her to go out with. Bukovi picked up bodybuilding after playing football in college. Owoc "had enough of a build for you to know he worked out, but not enough that he was going to jump up onstage in a pair of posing trunks," says Mark Lopez, who worked at the Apollo back then. Bukovi, who's shrunk considerably since he was crowned Mr. West Palm Beach in 1988, says he and Owoc didn't know about the drugs or killings. But both had studied chemistry in college and were captivated by the science behind sculpted bodies and how to find an edge with pills and powders. Owoc supported himself in those days by teaching high school science.

He eventually quit teaching and in 1993 opened a small sports supplement store. In the front room were the products, and in the back, Bukovi says, were a "piece-of-crap chair," a sink, a blender, a little burner, and a "metal piece-of-crap bed, the springy kind you have at summer camp." (In Owoc's telling, he slept on an air mattress.) Owoc called it VitaHouse: vitamins in the front, house in the back. The parent company was called Vital Pharmaceuticals Inc., or VPX for short.

Over the next two decades, Owoc built VitaHouse into a sports supplement retailer with revenue in the tens of millions. Archived versions of the company's website show Owoc in a dark suit and blue tie, encouraging customers to "live large" and signing off with "Jack Owoc, 'The Supplement Guru.' "

At the conference center, a ringing phone interrupted Bukovi's storytelling. He stepped away and returned moments later. The boss had summoned him.

"We gotta go," he told Joey Nickell, his lieutenant, who stood with his hands in his pockets.

What's the plan for the day?

"I don't know," Bukovi said. "We're gonna find out. We execute."

"That's what we do," Nickell said.

Bukovi nodded. "He tells us what he wants done, and we do it."

**In 2012, Owoc introduced Bang, an energy/pre-workout** combo drink. It was sugar-free, had more caffeine than most rivals, and was stuffed with other supposedly performance-enhancing ingredients. It was no instant hit. But in 2019 sales shot through the stratosphere, roughly tripling to $1.3 billion, and Bang's market share reached 9%, compared with about 0.5% two years before.

Two things had happened. Owoc had hired people from Red Bull and elsewhere to build out his network of distribution partners—companies that ship cans to stores. And Bang had begun a blitz on Instagram and TikTok involving more than 1,000 influencers. Mae Karwowski, chief executive officer of influencer-marketing company Obviously, says the strategy was simple and brilliant: "It's 'Do whatever you want, just have Bang in the background.' They were one of the first brands to do that in a really big way."

Open TikTok, type in "#bangenergy," and you might see two young women in white sneakers and string bikinis dance frenetically across a parking lot, a can of Bang planted on the ground. Swipe: There's a man shrieking and gushing Bang over a small fire caused by a curling iron. Swipe: There's a woman pouring water over her bosom; moments later she's drinking a Bang. They're all different but the same: upbeat, careless, provocative. Videos carrying the hashtag have been viewed more than 18 billion times.

As Bang took off, Owoc, now a billionaire on paper, began one of the stranger transformations in the annals of America's super rich. He rechristened his company Bang Energy. He traded his muscle T-shirts and normal button-downs for gaudy blazers and Bang-branded workout gear. He hung chunky gold chains around his neck. Every company-sponsored social media post now had his personal handle in the caption—@bangenergy.ceo. Under this moniker, he began broadcasting everything from shirtless workouts and his children's birthday parties to long monologues about how to become wildly successful.

One evening, Owoc summoned the film crew he'd hired to shoot a documentary about himself. To fix his thinning mane, he'd had hair transplanted from his face and back onto his scalp. It was time to remove the bandages covering the bloody mess beneath, and Owoc wanted it on tape as a record of perseverance. If you want something, he told the camera, you need to fight for it.

He all but stopped showing up at the office. To get time with the boss, executives had to drive to his mansion at the edge of the Everglades, usually in the evenings, because he rises late. Business was done at Owoc's kitchen table, sometimes while he ate. One former executive recalled how Owoc called ad hoc staff meetings in his garden, long after ▶

◀ normal working hours, and addressed employees from a stage.

In 2019, PepsiCo approached Owoc. In addition to selling its own drinks, PepsiCo is also the distributor for a stable of other beverages, delivering them to retailers on its vast fleet of trucks. The company already had a distribution agreement with another energy drink, Rockstar, and was barred from taking on others. But Rockstar's sales were falling, and PepsiCo wanted out.

A deal was hammered out that gave PepsiCo the exclusive right to distribute Bang. PepsiCo solved its Rockstar problem by announcing in March 2020 that it would buy the brand outright for $3.85 billion. Now free to take on new energy drinks, PepsiCo announced its distribution deal with Bang a few weeks later.

Many of Bang's existing distributors, which numbered in the several hundred, were enraged. An executive at one of them, recalling the day the announcement was made, motioned an imaginary dagger stabbing his heart. Ken Sadowsky, executive director at a distributor association in the Northeast, got frantic calls from members saying Bang was screwing them. "I remember thinking to myself: 'A crazy brand owner is terminating people. Shocking,' " he says.

Many also expressed amazement that PepsiCo, the corporate equivalent of a plain gray suit, would link arms with Owoc. One associate recalled a meeting with representatives of Walmart Inc. where Owoc projected a slide featuring three images: one of Red Bull CEO Dietrich Mateschitz; one of Monster co-CEO Rodney Sacks; and one of himself, shirtless, flexing his bicep. The slide's caption read, "Who's your daddy?" Could the PepsiCo executives up in New York really think this would end well?

Regardless, for Owoc this constituted a new apex of his improbable career. Bang seemed poised to threaten the dominance of Red Bull and Monster.

Then things began to fall apart.

**Owoc says his entire career is a campaign** against supplement companies peddling shady products. "I was tired of the lies and deception," he wrote on Bang's website. His social media accounts are peppered with videos in which he explains in intricate detail why his products' bold claims, unlike those of others, are actually true.

He did the same thing in glossy magazines he produced in the 1990s, after he'd opened VitaHouse. He usually dropped some off a few doors down at Gold's Gym. "His articles were packed with information that was difficult to decipher for a person who didn't have a science background," says Joe Troccoli, who worked at Gold's. "You didn't know if he was baffling you with bullshit, or if he was real. But God bless him—as long as you're not hurting anyone."

In 2008, Monster sued Owoc's company, alleging that it used deceptive marketing to boost sales of some of its products. Owoc denied the allegations, and the case was settled. A decade later, Monster sued Owoc again. It now took aim at one of the key ingredients in Bang: a substance Owoc calls "super creatine." Normal creatine helps muscles produce energy for bursts of intense activity, such as weightlifting. Some studies have shown that creatine supplements can boost that effect. According to Owoc, super creatine—a compound he says he created—is even more effective and can remain in liquids for a long time without deteriorating.

Monster accused Owoc of deceiving customers with faux science, saying its testing showed that Owoc's compound, once

PHOTO ILLUSTRATION BY BREAKFAST FOR DINNER FOR BLOOMBERG BUSINESSWEEK. OWOC: INSTAGRAM/BANGENERGY.CEO

ingested, couldn't break down to release normal creatine. And even if it could, the yield would be so small that you'd have to drink more than 100 cans to see a measurable effect. Owoc refuted the accusations in a statement that, characteristically, made it personal: "Jack Owoc is just too scientifically sophisticated for Sacks to compete. It's an unfair match—Owoc competing against Sacks/Monster is like Michael Jordan competing against a junior varsity high schooler."

It could have remained yet another drawn-out court battle between graying billionaires. But one day in August 2019, a man named David Fox, owner of a small California juice maker, called Monster and asked to speak with Sacks.

Decades earlier, Fox had cooked up a recipe for frothy,

sugary fruit juices and begun selling them from dispensers in stores and restaurants. He named his company Orange Bang Inc. and trademarked it. In 2009, after Owoc had begun selling a now-discontinued pre-workout drink also called Bang, Fox sued Owoc for trademark infringement. A year later they settled, agreeing that Owoc could keep using the name Bang as long as he stuck to a narrow fitness niche: The products had to contain a considerable amount of creatine and could be sold only in gyms and supplement stores.

When Bang, the energy drink, exploded across the country, Fox's lawyers sent cease-and-desist letters to Owoc's general counsel, saying the deal had been breached. Owoc brushed aside the letters. And so Fox, at the encouragement of a colleague who'd seen news about Monster's tussle with Bang, called Sacks. A few days later the two met and struck an agreement to join forces against Owoc. The matter eventually went to arbitration. The key question: Did Bang actually have enough, or any, creatine in it?

The arbitration was a disaster for Owoc. The scientific expert Bang put forth admitted in his testimony that there was no evidence supporting Owoc's claims about super creatine. Four studies commissioned to test the claims also failed to find measurable evidence. (Owoc dismissed the scientists who did the studies as "a bunch of little bitches.") In April the arbitrator ruled that Bang had broken its promise to the juice maker and meted out a $175 million penalty. Worse, he ordered Owoc to pay a 5% royalty to Orange Bang and Monster on all future US sales of Bang. This June a federal judge affirmed the ruling. Neither Orange Bang nor Monster responded to requests for comment for this story.

What's more, Bang's marriage with PepsiCo had soured. After the deal was struck, Owoc had expected a leap in sales. Instead they leveled off. Perhaps it was because the pandemic disrupted production, shipping, and foot traffic in stores. Or maybe PepsiCo just didn't prioritize Bang. Some of Owoc's associates cautioned their boss to be patient. It takes time to work out the kinks, they told him. But Owoc was convinced he was being sabotaged. In November 2020, less than seven months after the deal was announced, he declared it dead. He borrowed a well-worn phrase from a former US president and reality-TV personality he and his wife had publicly praised and donated to: "We sincerely expected PepsiCo to execute at an even higher level based on their enormous resources and promises. Unfortunately, we were wrong. PepsiCo, you're fired."

PepsiCo declined to comment for this story. In a statement at the time, the company said it was disappointed but noted that Owoc still was legally bound to the contract, which wasn't set to lapse until late 2023. In a memo obtained by the trade publication *Beverage Digest*, Kirk Tanner, CEO of PepsiCo Beverages North America, said Bang executives "have misplaced blame for Bang's performance on our execution, despite data demonstrating otherwise." Owoc's announcement had achieved little but to further raze his already fraught relationship with PepsiCo.

And that's where things stood when Owoc took the stage at the conference in New York.

**"You have uneasy relationships—" the moderator began,** and paused. Owoc, for the first time since he got onstage, stopped and stared at the man. Nine long seconds transpired. "—with both your competitors and your friends, and you often find yourself in court with them."

Owoc smirked, shook his head, and resumed his pacing. "I'm trying to bring the Bang, and he's bringing the negativity," he said.

The questions kept coming, and Owoc kept swinging at them. What about the recent arbitration? "A false ruling by a rogue arbitrator who has no background in science." What about the competition from upstart brands? "Knockoffs." His tendency to end up in court? "I worry more—pay attention here—if you're not getting sued, because that means you don't matter."

Off to the side, Bukovi, his lieutenant, laughed. "Once he gets into his rhythm," he said, "he's amazing."

And then there was the pressing question: What happens when the PepsiCo deal ends? Will your old distributors take you back? "We have a bunch of distributors waiting for the transition away from Pepsi," Owoc said. He knew, but didn't say, that the unhappy marriage with PepsiCo was over. A week later the two companies would officially announce their divorce, effective October.



By some measures, Bang's share of the US energy drink market has fallen to about 7%. The recent $293 million ruling in favor of Monster—the result of the 2018 suit—could be devastating. (Bang can appeal it after the final judgment, which could be even higher, is in.) And if Owoc by now hasn't signed up enough distributors to cover key areas, some large retailers may soon drop Bang altogether, sending sales into a tailspin.

"I think it depends on the level of contrition Bang will show," says Sadowsky, of the distributor association. "And I don't think 'Jack Owoc' and the word 'contrite' have ever been said in the same sentence."

After asking Owoc about the videographer following him around ("This will be a 'shockumentary.' It's not the normal documentary where you sit there and question and answer and it's very boring"), the moderator closed out the talk. Over a smattering of applause, Owoc plugged the social media app he said Bang soon would introduce: Ultra Social.

For the next hour he lingered to talk with conference-goers. He then gathered his entourage, including one of his family's seven nannies, now moonlighting as his assistant, and jumped into a black SUV. It sped off into the warm afternoon. Left on the floor in the empty room stood almost 400 unopened cans.

A few days later, Owoc posted a picture on Instagram of himself in a shiny black blazer and his dazzling pendant. Next to his head was a quote that read, "Power is an intoxicating and unquenchable aphrodisiac." Ⓑ —*With Deena Shanker, Jef Feeley, and Isaiah Poritz*

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Nothing can prepare you for a visit to Michael Heizer's epic artwork in the middle of the harsh Nevada desert
*By James Tarmy*

# Monumental





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Checking in to the Hotel Chelsea

October 10, 2022

Edited by
Chris Rovzar

Businessweek.com

A view of the *45°, 90°, 180°* area within Heizer's 299-acre land art, *City*

After an hour inside the 299 acres that make up artist Michael Heizer's *City*, a white Chevy Tahoe emerged from around one of the site's colossal, gravel-covered mounds. It was my driver, Ed, there to tell me that storm clouds were fast approaching across the Nevada basin. Would I like to take refuge in the car? No, I would not: I had only a finite amount of time to take in the immensity of Heizer's magnum opus before heading back to Las Vegas; I couldn't waste precious minutes sitting around.

Ed disappeared beyond yet another of *City*'s seemingly endless walls and valleys, gone just in time for a drizzle to turn into serious rain and for me to regret declining his offer.

Searching for shelter across the vast expanse, I headed roughly a quarter-mile away to a concrete mountain adorned with angled slabs that Heizer calls "steles." In a half-walk, half-jog, I made it up the structure's dirt ramp just as the sky opened. For at least 10 minutes I huddled there, surveying the entirety of Heizer's wildly ambitious creation in the shadow of a roughly 42-foot-high stele while rain poured around me.

*City* is so big—roughly half the size of Manhattan's Central Park and a mile and a half from end to end—that its enormous dirt plazas, gentle stone slopes, and patches of green seem to go on indefinitely. Browns and grays fade, indistinctly, into the mountain ranges on the horizon.

Heizer, now 77, grew art-world famous in the 1970s as an early progenitor of the earthworks movement (also called land art). A group of rugged men and a few women in theory eschewed the materialism of pop art and fancy New York galleries, working instead in the American wilds, forcing the land to yield to their ideas of minimalism and modernity. In practice, this often meant that they went into the middle of nowhere, carved monumental shapes into the ground, took pictures, and then returned to the city to great acclaim.

After bouncing around New York in the late '60s, Heizer bought a property in Nevada and officially began to build *City* in 1970. He'd made several other earthworks already, most notably his 1968 piece *Nine Nevada Depressions*, a series of swirling and jagged excavations in a dry lake bed, and *Double Negative*, a 50-foot-deep gash he'd cut into the desert that's as long as the Empire State Building is tall. Back then there was no indication that his first effort at *City* would morph into a life-encompassing project.

That initial structure, *Complex One*, has angled walls made from rough concrete, a flat roof, and projecting concrete shapes that appear to float. People have drawn connections between its 140-foot-long bunkerlike form and the Vietnam War, which was well under way by the time Heizer began it. But his next phase, *Complex Two*, a thousand-foot-long series of pyramidal walls on top of which I huddled during the storm, defies easy connections to a zeitgeist.

The most photogenic part of *City*, a sculpture called *45°, 90°, 180°*, is likewise divorced from time and place. A collection of towering triangles and rectangles fixed to a concrete slab about a mile away from *Complex One*, the smooth, crisp shapes look like massive game pieces. A few appear to lean against a backboard; others look like sundials in search of orientation.

Where *City* ends, the desert abruptly begins

As gigantic as *45°, 90°, 180°* is, on the approach it seemed diminutive, dwarfed by the maze of valleys and raised domes Heizer had dug down or built up around it. He was periodically tweaking some of the shapes and orientations of the topography until this summer, when the public learned *City* was finally open. (Heizer doesn't consider the project complete.)

Most of the art world had known it was nearly done for a while. Not only did Heizer rely on the kindness of 50 years' worth of collectors, dealers, and arts administrators to help fund its roughly $40 million price tag, but also by the time its opening was announced, Heizer had long since transferred ownership to the Triple Aught Foundation, whose board consists of luminaries including billionaire casino owner Elaine Wynn and Michael Govan, the chief executive officer and Wallis Annenberg director of the Los Angeles County Museum of Art

The pyramidal lines of *Complex Two*, with its steles jutting over the top

and a long-time supporter of the project. (The foundation has built up a $30 million endowment for *City*, which costs about $1.2 million a year to maintain.) The megagallery Gagosian has represented Heizer since 2013, and over the years a handful of journalists visited Heizer in Nevada and returned with reports of the almost-complete wonder in the wasteland.

Even so, when official word came that *City* was open, thousands of people applied to visit in the first week. The site is open to the public in the spring, summer, and fall, but only six people can visit the site at a time, and everything has to be coordinated through the foundation. (They're already booked for this season. Requests will be dealt with on a first-come, first-serve basis when the site reopens next year.) For the time being, most people will have to rely on pictures of the project, which, I discovered, bear little to no resemblance to the thing itself.

The first stage of the trip is a roughly hour-and-a-half drive from Vegas to the town of Alamo, Nev. There I met Ed, the foundation's driver, and we rode for another hour and a half, mostly along a well-maintained dirt road that meanders through federal land, past scrub grass and white sage, around boulders, and occasionally alongside mountain ranges. From the approach, *City* doesn't look like much. Lots of it is below grade, so the first thing you see is just a few gravel ridges, nearly indistinguishable from the rest of the landscape.

From pictures, it looks as if the entire complex is covered in concrete, a kind of skate park in the middle of nowhere. (The skateboard magazine *Jenkem* recently sent an intern on an unauthorized and unsurprisingly abortive attempt to skate there.) In reality, the ground is rocky dirt, with the texture and look of a rural construction site. With the exception of the rough concrete walls of *Complex One* and *Complex Two*, along with more rough concrete adjacent to the smooth concrete shapes of *45°, 90°, 180°*, the entire site is loose gravel with winding concrete curbs that tend to delineate large pebbles from small ones.

Because most of *City* was created by excavating itself, the mounds that rise above the horizon were drawn from indentations elsewhere, and the two types of gravel that cover its slopes were drawn directly from the soil. That gravel, I quickly discovered, isn't adhered to anything: Should you desire, you could scuff lines into *City*'s pristine expanse. Although it was unclear if I was supposed to be walking up and down the project's slopes, I did so, gingerly. It's an unusual type of existential pressure, almost like handling an artwork on paper without gloves.

At the bottom of a sunken stadium, I began to see how Heizer uses the gravel like an extremely minimal palette, its millions of stones blanketing the land in a monochrome tapestry. The result is a topography that's reduced to abstract shapes and forms. But it takes time to see it. I had to walk through it, peer around bends, and trudge up and down slopes to realize I was in a totally bizarre, maximalist form of minimalism.

I'd expected these gravel areas to be a kind of throat clearing before the main events, the two definable sculptures at either end of the compound. In reality it's the reverse: The sleek geometry of *45°, 90°, 180°* is beautiful, obviously, and the concrete projections of *Complex One* definitely looked like Art with a capital A. But *City*'s vast reaches–its ramps, valleys, and sunken racetracks–feel like a more complete, articulated vision.

And what, exactly, is it a vision of? Before I visited, I would have parroted existing discourse about the aesthetic parallels between *City* and pre-Columbian cities such as Teotihuacan and temples like the Mayan ruins of Chichen Itza; I would have described Heizer's efforts as an attempt to create something similar, a memorial to his own macho fight against time and the elements.

After my visit, I'm not so sure. First of all, *City* is more fragile than it looks. It's mostly gravel, and the Nevada desert is a harsh place, with biting wind, flash floods, and punishing heat. Some of the concrete is already cracking, and in other places, the work sort of fades into the desert. Just as important, *City* might be reminiscent of many places and things, but when you get down to it, it doesn't actually look like anything at all. Instead, it's a distillation of ideas–of minimalism, of machinery, and of modernity–magnified to an almost absurd degree.

As the rain stopped, the place became utterly silent–no birdsong, no breeze, only the sound of my own feet on the dirt. I decided I'd finally understood the point of the place, or perhaps Heizer's punchline: *City* is a very lovely, very lonely place. B



PREVIOUS PAGE: MARY CONVERSE/COURTESY OF TRIPLE AUGHT FOUNDATION. THIS PAGE, FROM TOP: JOE ROME/COURTESY TRIPLE AUGHT FOUNDATION. ERIC PIASECKI/COURTESY TRIPLE AUGHT FOUNDATION

The Great Porch is flanked by Clay restaurant (left) and Thistle spa (right)



# Betting The Farm

## A new Auberge resort aims to lure city folk to a pastoral oasis

*By James Gaddy*

"Everybody's from Brooklyn."

Emily Galvin, an experience coordinator at Wildflower Farms, Auberge Resorts Collection, in New York's Hudson River Valley, had just asked me where I'd driven from. (Brooklyn.) A group of us were gathering eggs, still warm, inside the wire fence surrounding the chicken coop. A rosy-cheeked toddler wearing a Carhartt beanie was digging into a paper bag full of mealworms and other delicacies, then squealing with delight as she hurled fistfuls of the stuff over the pecking head of Rimona, the resident rooster and one of 70 feathered fowl here.

About a two-hour drive north of New York City, in Gardiner, Wildflower Farms opened on Sept. 30. It leans hard into a rustic sort of luxury: Here, urbanites pay $1,000 a night for the privilege of picking fresh-laid eggs and bringing them to the chef for a morning omelet. At 5 p.m. every evening, a couple of lumberjack-looking guys chop wood out front and fill up fire pits surrounded by Adirondack chairs until everyone's clothes smell like smoke.

Brooklynites, and city slickers in general, have flocked to the Hudson Valley in droves lately. The resort is the latest draw for wealthy visitors and homebuyers who fantasize about being a gentleman farmer—a shift that was supercharged by the pandemic. Home prices jumped as much as 35% in some locales over the past two years, and demand remains high.

In that sense, Wildflower's husband-and-wife managing directors Phillip and Kristin Rapoport were ahead of the curve, veritable pioneers. They, too, are from Brooklyn: They first visited the area 15 years ago to go rock climbing and fell in love with it.

The couple bought a place in Gardiner in 2010, a 10-minute drive from New Paltz (population 7,000), and in 2016 they persuaded the owner of a plant nursery to sell them his 140 acres. At the time, Kristin was in private equity at Fortress Investment Group and Phillip was at Stone Ridge Asset Management, after they'd started their careers at Morgan Stanley and Goldman Sachs, respectively. Now this is their full-time job.

The property is nestled beneath the Shawangunk Ridge, or the Gunks, one of the highest-rated rock climbing destinations in the US. The local natural beauty has been drawing people from the city for as long as there's been a city on the island of Manhattan—whether it was the Hudson River School of painters who, in the mid-1800s, used the landscape to create early masterpieces of American art or hippies settling in Woodstock, a 45-minute drive north, in the 1960s and '70s.

But other than the venerable Mohonk Mountain House, which sits on the crest of the Shawangunk Ridge, the area had lacked the sort of upscale accommodations you might expect from a place on the doorstep of the financial capital of the world. "New York is really starved for high-quality getaways within a short drive," Phillip says. "They tend to be really romantic, far-flung escapes that cater to a couple being alone."

Developers are taking note, and hospitality ventures have begun sprouting up to match the rise in residential real estate interest. The Maker hotel in Hudson opened in August 2020, and Hutton Brickyards did so in Kingston in May 2021. Inness, which has a bare-bones ski-chalet feel as well as a golf course, has been in operation since July 2021.

For Auberge Resorts, the risk of working with first-time hoteliers as management was offset by the couple's plan for a modern retreat that would ensconce visitors in nature—glamping on steroids. "They were a little greener than most," admits Craig Reid, chief executive officer of Auberge. But he knew firsthand that the area's high-end options were limited: His daughter was married in nearby Rhinebeck. "I literally had to rent toilets for that wedding," he laughs. "I've seen the shift away from formal venues. It's really a combination of consumer tastes and someone having the vision to execute on those tastes."

As such, the property has a more relaxed, less Old Money feel than Auberge's other New England locations such as the

COURTESY AUBERGE RESORTS COLLECTION

Mayflower Inn & Spa in Connecticut and the Vanderbilt in Newport, R.I.

Each of the 65 rooms at Wildflower Farms is a free-standing wood cabin with a gas heater that looks like an old-fashioned wood stove. Several have covered terraces that face the Gunks to the west. Walking back after dinner feels almost like heading home—I was tempted to look for a mailbox with my name on it. Reid uses the word "characterful" to describe the property. "It's a working farm," he says. "There's a wildness about it. The vegetation around the building are grasses and wildflowers, not lawns."

Guests are encouraged to feed the 70 chickens

The overall aesthetic is minimalist hunting lodge meets city loft apartment—hewn-stone walls, lots of wood with leather accents, fabric colors that cover the spectrum of fall foliage—as if the High Line had been expanded and turned into a luxury resort. Interiors are by Ward + Gray, a duo who worked on Dumbo House, Soho House's outpost by the Brooklyn Bridge.

"We were drawn to anything handmade," says Christie Ward, one of the studio's principals. "We have a love for something to look worn or used, like you're escaping to someone's country home." Indeed, the decor looks like it was collected by "tromping through Brimfield in our wellies," as her co-principal Staver Gray put it, referring to a popular antique flea market in Massachusetts.

The centerpiece of the resort is the Great Porch, a giant portico with a fire pit at the center that serves as main entrance and gathering spot. Anytime during the day, the sofas and chairs are filled with guests eating smoked trout dip, $27 burgers, or fries, sold separately, flecked with sage.

One side of the building is the Thistle spa, where you book facials and massage treatments or simply lounge, as many couples did when I was there, by the heated saltwater pool. (No kids to be found here.) Another pool and two hot tubs are outside.

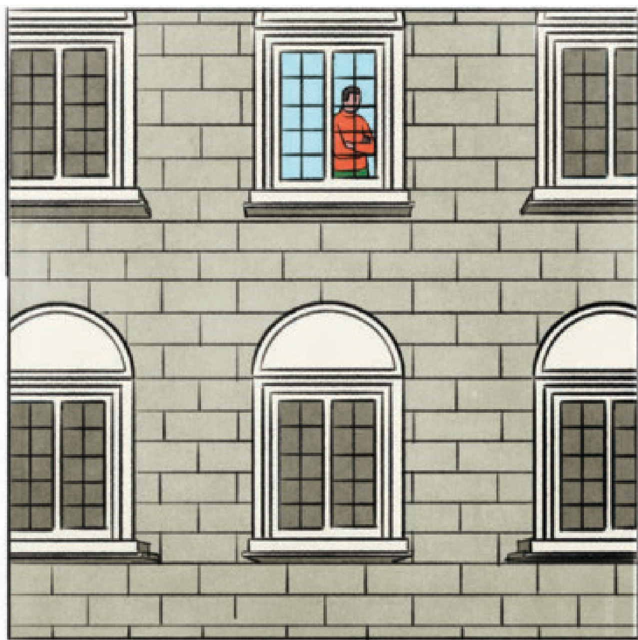
And no, not everyone's from Brooklyn. One Hudson Valley local came with her mom to get a Mama Natural massage ($215), which targets the aches and pains of pregnant women. She said it was great having something this nice so close.

A 650-square-foot meadow cottage cabin

On the other side of the Great Porch is the restaurant, Clay, so named for the type of dirt that Gardiner is infamous for. Pretty much all the entrees, from the $180 dry-aged porterhouse for two to the delectable $32 hen of the woods mushroom, goes on the wood-fired grill in the kitchen. Snacks and smaller bites include $16 milk bread and $18 farm tomatoes with ginger and cinnamon. All were, without exception, meticulously prepared and delicious.

That clay soil, however, is the main reason the farm portion of Wildflower Farms remains a work in progress. There are three greenhouses on the property that mostly grow tomatoes, herbs, and greens. The goal is to eventually have a farmers market with cooking demonstrations from visiting chefs. But the best use of the land right now, one of the farmers told me, is for animals. Hence, the 10 Berkshire pigs in a muddy pen a short walk away. And the 70 chickens.

All of which fits the Rapoports' plan to make something family-friendly, not family-focused. There are hiking trails and e-bike tours and even a playground built on-site. But the kids I saw were perfectly content feeding the chickens. When all the mealworms had been tossed, one young rascal even tried to sneak up the ramp, like a fox, to get inside the henhouse before her father caught her. She wailed all the way back to her Uppababy stroller, but by the time I ran into them at breakfast, her in her highchair eating the eggs she'd gathered, she once again seemed the very definition of a happy camper. Ⓑ



# New York City's Co-Op Flip-Flop

## To save themselves, New York's elite buildings are breaking their own rules

*By James Tarmy and Jennifer Epstein*



Try to explain how some of New York's "best" co-ops function to an out-of-towner, and you'll be met with slack-jawed disbelief. Yes, the city's limestone-clad apartment buildings are home to some of the most powerful people in the world, but, no, these moguls can't buy a dog if it fails to meet their co-op's breed restrictions.

Nor are they allowed to move their primary residence to another state or—God forbid—renovate during the fall, winter, or spring, lest construction noise disturb residents. Also: They can't sell their apartment without the co-op board's say-so, meaning that even if they've lined up a willing, able, and solvent buyer, the building can—and often will—simply reject that person for no stated reason.

Purchases very often have to be all-cash, with lots more left over in the bank for maintenance. Oh, yes, that, too: Maintenance, which includes building upkeep and taxes, often runs at more than $12,000 a month for each resident. And don't expect amenities such as a pool, a gym, or—with a few exceptions—a balcony and outdoor space.

Just to be clear: These rules are, or were until recently, perceived to be extremely desirable. For decades, financiers who made markets tremble, heirs to the greatest fortunes in America, doctors who revolutionized their fields, and lawyers who billed thousands of dollars an hour for their expertise were reduced to groveling supplicants as they begged for the opportunity to live under a co-op board's iron rule.

But faced with disappointing resale prices and prolonged competition from high-end condos, the city's longtime bastions of exclusivity and wealth are opening their doors, if only by a crack, to let in a new breed of the very rich. There's no sign on the facade, no good way to get the word out except for discreet word-of-mouth, but it's official: New York's top-tier co-ops are changing their ways.

This summer, brokers say, the formidable 730 Park Avenue began allowing buyers to finance 50% of their purchase and extended its summer work period to mid-March through mid-September. Nearby 953 Fifth Avenue, a slender 14-story building overlooking Central Park, has ramped-up financing to 60%; 11 East 86th Street, half a block from the park, also changed its rules in the past year, from 50% financing to 65%.

Rumblings of the discontent that led to this breaking point can be traced to the 1990s, when New York's new rich considered previously unheard-of locations like Tribeca and SoHo—far from the co-op's spiritual home on the Upper East Side. Change accelerated in 2008 with the opening of 15 Central Park West, a condominium designed by Robert A.M. Stern Architects LLP that looked like a co-op—the marble lobby, the liveried doormen—but didn't have any of the restrictions.

More followed, and roughly a decade ago luxury condominiums, long considered the co-op's tawdry cousin, became an acceptable alternative. Captains of industry had tired of pretending they weren't, and co-ops began a yearslong decline.

In 2010 the average sale price for a four bedroom-plus Manhattan co-op was $6.7 million, according to a report by Douglas Elliman Inc. By the end of the decade, it had slipped to $5.5 million. The average price of a comparable condo in 2010 was $7 million, but by 2019 it had shot up to $11.4 million.

Watching this unfold, residents of the city's co-ops were aghast: Not only had they invested millions of dollars into an underperforming asset, but arrivistes and foreign investors were leaving them in the dust, buying off a condo's floor plan and doubling their money before the building had even broken ground. The natural order had been upended, and measures were needed. Co-ops were on life-support, and it was up to their boards, who have a fiduciary duty to protect the interests of their shareholders, to perform emergency resuscitation.

They did, in their own lumbering fashion. Co-ops loosened rules on renovation, allowed apartments to function as pied-à-terres, and, most important, lowered restrictions to appeal to buyers who might be rich enough to purchase a $4 million apartment but not so wealthy they could simply plop down $4 million in cash.

In the simplest terms, a co-op is a building owned by shareholders, meaning when you buy into a co-op, you become responsible for the building itself rather than just

ILLUSTRATIONS BY KLAUS KREMMERZ

your own unit. Should a neighbor neglect to pay their fair share, everyone else is obligated to pick up the slack. This isn't an academic concern. In the 1970s, New York teetered on the edge of bankruptcy, and crime ravaged the city. The real estate market collapsed. Many people saw no reason to make payments on apartments that in some cases were worth less than the monthly maintenance.

Under the auspices of financial prudence, co-ops that could afford to be picky (and, many have alleged, discriminatory) became even more so, demanding that potential residents disclose their entire financial history, provide letters of recommendation, and be so solvent that monthly maintenance payments would never be an issue.

In the co-ops that make up the city's top tier on the Upper East Side and Central Park West, these requirements came to mean that buyers had to be a very specific kind of rich: rich enough to buy an apartment in cash, but also rich enough to have important friends to write letters of recommendation, belong to the right clubs, sit on the boards of the right charities, have gone to the right schools. A kind of rich, it turns out, that doesn't quite include many of the rich people currently buying real estate.

This is another reason things began to fall apart for the co-ops. Younger people see no appeal in living in a building where residents have to pay 100% cash, says Madeline Hult Elghanayan, a broker with Douglas Elliman. "They'd rather put their money in an investment than in an apartment. It's a very different concept of what you do with your money."

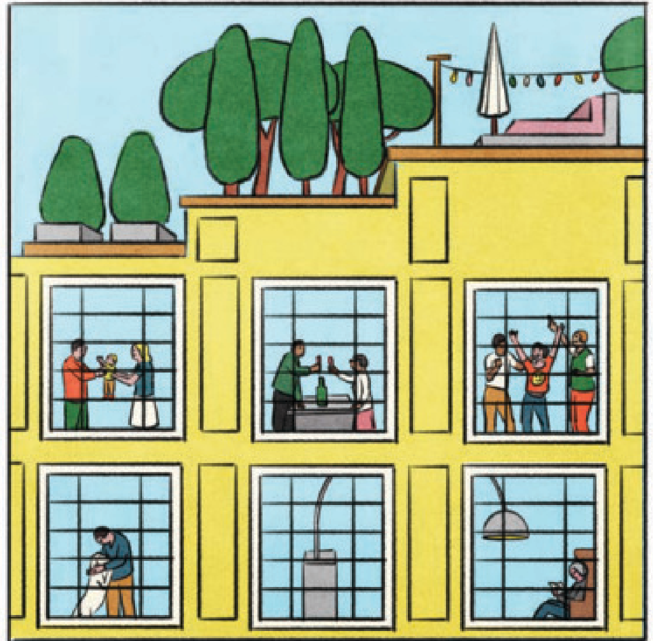
Privacy matters, too. Today's 30- and 40-year-olds have some reservations about allowing strangers to pore over their personal finances and tell them what they can (or can't) do in their home. This new generation of homebuyers "wants to be able to rent their apartments out if they ever have to move for work," says Rebecca Blacker, a broker at Coldwell Banker Warburg. "They don't want to expose themselves with a board package where you're submitting everything about your financials."

The age of the buildings themselves is another problem that's compounded by renovation rules that limit construction to summer months. No matter how prestigious the building's address, if it's a century old, things will start to break. "You buy this beautiful apartment, but you have to upgrade the electric and bathrooms, and a lot of units are gut renovations," says Hult Elghanayan. "With summer work rules, it will take two and a half years to move into your big, expensive home."

Now that younger residents are migrating uptown in greater numbers and older ones are departing by way of Palm Beach, Fla., or the Frank E. Campbell Funeral Chapel, the trickle of co-ops that have slackened restrictions has become a flood.

"Buildings we never thought would consider financing or dropping summer work rules have done it," says Serena Boardman, a senior global real estate adviser at Sotheby's International Realty, who didn't specify which ones. "It's been music to my ears. It broadens the potential pool so much."

What all these changes haven't achieved—at least not yet—is



to markedly improve the resale value of co-ops. "They're all so late to the party," says Donna Olshan, a broker who publishes a weekly luxury market report. In 2021 sales of co-ops priced at $4 million and up were dwarfed by condominium sales in the same tier: Just 343 contracts were signed for co-ops in Manhattan, according to Olshan's report, compared with 1,316 condos. The average asking price for a co-op was $7.2 million; the average asking price for a condo was $8.4 million.

Other brokers say that imbalance is set to change. "Pricing will increase in co-ops," says Hult Elghanayan. "Co-ops are the sleeping dog: It's just about to wake up."

New York has a social hierarchy, and co-ops remain, for a certain group, at its peak. After two years of summers in East Hampton on Long Island and winters in Aspen, Colo., the city's old guard might technically not be full-time city residents, but when they're here, they'd like to be at an address that counts. And when they do want to leave for good, they want to know that there's someone waiting to take their place.

It's for these New Yorkers that co-op boards have relaxed their rules, though not their selectiveness. "A lot of buildings are looking at financial requirements and saying, 'We want to attract young, up-and-coming, successful people making their way in New York, who are contributing to the city culturally, philanthropically, socially,' " says Boardman. "Those people are the fabric of the city, and boards want to welcome them."

The early response has been positive, if modest. Even if prices haven't skyrocketed, the time Manhattan's luxury co-ops stay on the market has plummeted, dropping 49% in the second quarter from the same period a year before, according to an Elliman report. The number of days on the market could decrease even further, brokers say, if more buildings fall in line. "There's still more to go," says Boardman. "And the perception in general of a co-op is a daunting concept, so I think it will take some time for it to settle in." B

An atrium at the Lobby Bar



# Where Ghosts Are Welcome Guests

The newly reopened Chelsea Hotel weaves history into the fabric of the present. *By Hannah Elliott*

The past hangs heavy at the Chelsea Hotel. Anyone with a taste for culture can pick their favorite soul who inhabited the gilded flophouse on 23rd Street in Manhattan, the city's tallest building when it was completed in 1884. Thomas Wolfe, writing *You Can't Go Home Again* in the 1930s. Dylan Thomas, who drank too much and contracted a fatal case of pneumonia here in 1953. Jasper Johns in the late 1960s, between his flag and crosshatch periods. Edie Sedgwick after the height of her Factory days. Patti Smith and Robert Mapplethorpe sharing a room on the 10th floor for $55 a week circa 1969. Betsey Johnson and Madonna before they were famous. Sid Vicious and Nancy Spungen in 1978—you may have heard how that went.

In the '60s, Arthur Miller checked in, tail between legs after his split from Marilyn Monroe. "The Chelsea's walls could tell a lot about the self-loathing of talented people," he wrote.

But the Chelsea has been closed to the public for more than a decade, since real estate developer Joseph Chetrit paid $80 million for it in 2011 and began start-stop gut renovations. It changed owners again in 2013, and years of battling with residents over who should be allowed to stay, and at what cost, began. Current co-owners Sean MacPherson, Ira Drukier, and Richard Born, whose portfolio at BD Hotels includes the Bowery Hotel and the Jane Hotel, also in Manhattan, paid $250 million in 2016 for the Hotel Chelsea. (That's its real name, but if "Chelsea Hotel" is good enough for Leonard Cohen, it's good enough for me.)

Reopened on March 14 after an additional $100 million restoration, it now has 155 guest rooms, a glittering jewel of a bar, and a fresh take on El Quijote, the ground-floor Spanish restaurant. A rooftop spa and fitness center are coming soon. Forty-five permanent tenants still reside in the building, a throwback to when it was a longer-term home for people like Cohen—and a tribute to New York City's sticky anti-eviction laws.

True believers will find magic at the Chelsea, though I won't argue with the old-timers who say its outsize magic has diminished—it's tough to compete with those artists and outcasts who gave it its reputation in the first place. In its latest iteration, the Chelsea isn't grand, but it would be a sin to make it so. Its rich history gives you the feeling that when you stay here, anything can happen. In some ways, the hotel is similar to my 1975 Rolls-Royce: It's got great bones, style, elegance, and a whiff of attitude, but it's a little frayed around the edges.

The front desk is tucked underneath the staircase, where in 1969 Janis Joplin posed in fur for David Gahr. The wall behind it is now adorned with red-tasseled keys hung in rows and framed by those unmistakable wrought-iron stair railings above. Protective steel netting suspended above the desk is a reminder that the place remains a work-in-progress. The elevator—famously slow in Miller's day and intermittent ever since—was out of service, so I climbed the stairs to my 7th-floor hideaway.

The Lobby Bar, washed in yellow light, is a comfortable space with many nooks in which to snuggle. The skilled staff sets a friendly tone. Especially lovely is dark-haired hostess Taylor Jane with her beautiful gloves, short and sheer and

A guest room

PHOTOGRAPHS BY ANNIE SCHLECHTER/COURTESY CHELSEA HOTEL

At the Lobby Bar, the tenders know how to mix the classics and smart new concoctions



red one night, elbow-length and black another. White-suited attendants move like synchronized swimmers behind the bar, arms blurry as they shake martinis against the glowing lights. They mix elixirs with literary names like Cowboy Mouth and Naked Lunch and easily executed my standard boulevardier (read: bartender litmus test), a Negroni-like tipple made with bourbon instead of gin.

Another night, they made me the Edie '67, a spirited concoction of mezcal, ginger, and gochujang honey. I tried, at various times, the trout roe beignet, which tasted like a high-class lobster roll, and a juicy cheeseburger. (Order fries, because they don't come automatically.) As at grand European hotels, no music played during the string of nights I found myself here before swirling off to my room.

The beds are lavishly appointed and almost too soft. Mine occupied most of my library-silent room, save for a white marble two-top table and tiger-print chairs. In the bathroom, there was an oversize marble tub. Many rooms have fireplaces and small balconies. The famously 3-foot-thick walls of yesteryear have, to my ear, survived.

True to Miller's experience—"Mary [McCarthy] had recommended the Chelsea as a cheap but decent hotel"—rooms range from $345 a night for a studio queen to $3,600 for the pied-à-terres. It's pricier than corporate scourges but more affordable than lots of glossier establishments. If you think "the rooms are too small" is a fair critique for a Manhattan hotel, this isn't the lodge—nor, to be frank, the city—for you.

Thankfully, there's a new menu at El Quijote, reopened with the same artwork and familiar red jackets on the servers. Standouts include tuna crudo, toasted angel hair pasta, and a $72 plate of paella that "takes a while," the server told me.

That international travelers should come to the Chelsea searching for some lost bohemia—or at least some rock 'n' roll—is nothing new. The hotel attracts, from what I saw, well-off fortysomething men with tans, accents, and open shirts; older couples just in from the Metropolitan Opera season opener, judging from the tuxedo and gown; art industry women discussing history with the beautiful young men who attend the front desk and the door; and Lou Doillon, the French chanteuse. The *Saturday Night Live* cast recently did a photo shoot here, said Eric Jasper, the maestro in the red hat who leads those *gemütlich* evenings in the Lobby Bar.

Unlike actor Michael Imperioli, I saw no ghosts. (He told the Bio Channel he saw one, named Mary, in 2010. Apparently she's a known fixture here.) One resident who's seen phantoms told me they appear at the oddest times but aren't malicious, simply "trapped." I'm disappointed I missed them, but then, Gotham is full of ghosts for all of us who've lived and loved here. It would feel empty without them.

"Despite parboiling myself in the shower a few times, I began to like the hotel," Miller wrote after his stay stretched into months. I am with him in his affection (and grateful for the improved plumbing). After all these years, the soul of New York is alive and well in the Chelsea Hotel. Ⓑ

# 10 Companies To Watch

These stocks—for better or worse—are in the spotlight at Bloomberg Intelligence

## Aker BP

● Buoyant energy markets are helping the Norwegian oil producer's cash flows. BI expects the 2023 dividend to beat consensus by about 15%, and this could be further enhanced by a special one-time payout. An important field, Johan Sverdrup Phase 2, is set to come onstream during the fourth quarter. —*Will Hares*

● DATA SHEET

| | |
|---|---|
| Market value | $18B |
| Sales, last 12 months | $8B |
| Expected 2023 revenue growth, consensus | 20% |

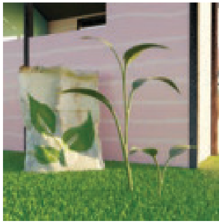
## Brown-Forman

● The maker of Jack Daniel's is poised to deliver some positive earnings surprises, with bars and restaurants—where people tend to buy more premium spirits—thriving again. BI's analysis points to fiscal 2023 sales topping the consensus estimate by 6%, driving a 15% earnings-per-share beat. —*Ken Shea*

● DATA SHEET

| | |
|---|---|
| Market value | $32B |
| Sales, last 12 months | $4B |
| Expected 2023 revenue growth, consensus | 5% |

## CF Industries



● CF Industries, one of the two largest US-based ammonia producers, looks to gain from global supply shortages. Consensus estimates appear to underappreciate CF's opportunity, with many analysts predicting ammonia prices will fall in 2023 despite shortages stemming from Russia's war in Ukraine. —*Alexis Maxwell*

● DATA SHEET

| | |
|---|---|
| Market value | $19B |
| Sales, last 12 months | $10B |
| Expected 2023 revenue growth, consensus | -18% |

## China Gas

● The consensus for China Gas seems focused on demand recovering and retail volumes growing, but selling prices remain stagnant and feedstock costs are soaring. BI sees about 1 yuan (14¢) in earnings per share for fiscal 2023, vs. a consensus estimate of about 1.5 yuan. —*Henik Fung*

● DATA SHEET

| | |
|---|---|
| Market value | $6B |
| Sales, last 12 months | $11B |
| Expected 2023 revenue growth, consensus | 16% |

## Emerson

● The electrical equipment maker's industrial automation business will benefit from high energy prices, offering a welcome boost to its multiyear financial restructuring. BI's scenario points to above-consensus sales and profit margins, with an earnings surprise of almost 10% in fiscal 2023. —*Karen Ubelhart*

● DATA SHEET

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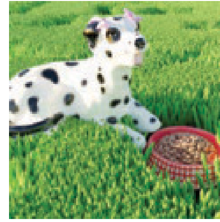
|---|---|
| Market value | $44B |
| Sales, last 12 months | $19B |
| Expected 2023 revenue growth, consensus | 5% |

## Freshpet



● A new operation in Ennis, Texas, is set to increase capacity to produce fresh, refrigerated food for cats and dogs sixfold by 2025, helping the company meet demand from pet owners. A BI analysis suggests management can meet its goal of $1.25 billion in sales by 2025 two years earlier. —*Diana Rosero-Pena*

● DATA SHEET

| | |
|---|---|
| Market value | $2B |
| Sales, last 12 months | $0.5B |
| Expected 2023 revenue growth, consensus | 29% |

## Idorsia

● Idorsia's Quviviq is the best available insomnia therapy, but consensus estimates suggesting sales will double those of Merck & Co.'s rival product look aggressive. BI expects 2022 revenue of about 30 million Swiss francs ($30.4 million) for Quviviq, but the consensus is for more than twice that. —*Michael Shah*

● DATA SHEET

| | |
|---|---|
| Market value | $2B |
| Sales, last 12 months | $45B |
| Expected 2023 revenue growth, consensus | 191% |

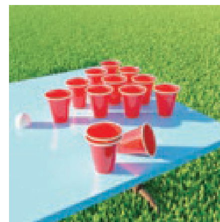
## Meta

● Following changes in Apple's iOS pricing and policies, Meta's core advertising growth is slowing. But that comes just as operational costs are rising. Estimates for Meta's key gross profit margin could be revised downward by as much as 10 percentage points for 2023, based on BI's analysis. —*Mandeep Singh*

● DATA SHEET

| | |
|---|---|
| Market value | $366B |
| Sales, last 12 months | $119B |
| Expected 2023 revenue growth, consensus | 10% |

## Rongsheng



● The Chinese plastic maker is tripling its exposure to higher-end ethylene-vinyl acetate (EVA) plastics with two additional ethylene crackers. The new facilities could boost Rongsheng's net profit 8% above 2021 levels, yet its stock is trading in line with peers with less ambitious expansion plans. —*Horace Chan*

● DATA SHEET

| | |
|---|---|
| Market value | $19B |
| Sales, last 12 months | $37B |
| Expected 2023 revenue growth, consensus | 13% |

## UniCredit

● Investors worry that European bank credit quality will falter, but those fears look overblown for the Italian lender, given asset quality trends, net interest income growth, and its strong capital buffer. BI believes the consensus estimate of loan loss provisions for 2023 could be more than 20% too high. —*Jon Tyce*

● DATA SHEET

| | |
|---|---|
| Market value | $20B |
| Sales, last 12 months | $21B |
| Expected 2023 revenue growth, consensus | 1% |

*Market value as of Sept. 29

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**Bloomberg Businessweek** (USPS 080 900) October 10, 2022 (ISSN 0007-7135) H Issue no. 4758 Published weekly, except one week in February, April, May, June, July, August, September, October and November by Bloomberg L.P. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Executive, Editorial, Circulation, and Advertising Offices: Bloomberg Businessweek, 731 Lexington Avenue, New York, NY 10022. POSTMASTER: Send address changes to Bloomberg Businessweek, P.O. Box 37528, Boone, IA 50037-0528. Canada Post Publication Mail Agreement Number 41989020. Return undeliverable Canadian addresses to DHL Global Mail, 355 Admiral Blvd., Unit 4, Mississauga, ON L5T 2N1. Email: contactus@bloombergsupport.com. QST#1008327064. Registered for GST as Bloomberg L.P. GST #12829 9898 RT0001. Copyright 2022 Bloomberg L.P. All rights reserved. Title registered in the U.S. Patent Office. Single Copy Sales: Call 800-635-1200 or email: bwkcustserv@cdsfulfillment.com. Educational Permissions: Copyright Clearance Center at info@copyright.com. Printed in the U.S.A. CPPAP NUMBER 0414N68830

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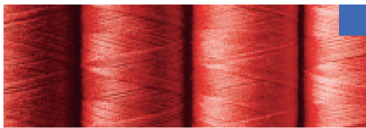

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