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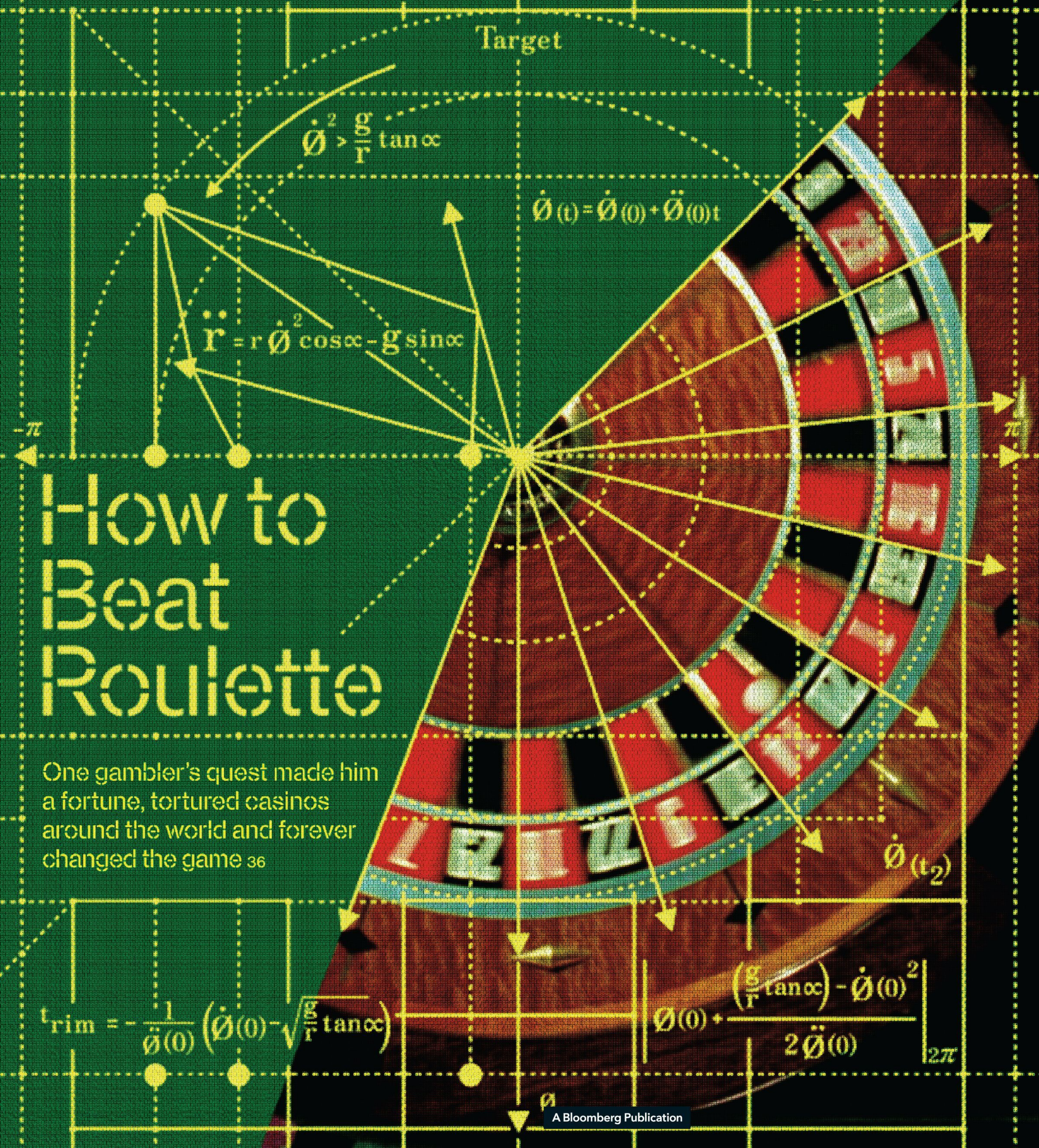
Bloomberg Businessweek

April 10, 2023 ● DOUBLE ISSUE



How to Beat Roulette

One gambler's quest made him a fortune, tortured casinos around the world and forever changed the game 36

A Bloomberg Publication

Resilience During Times of Change:

Ireland's Growth in Focus

Ireland is a thriving hub for some of the world's biggest companies, as well as thousands of homegrown enterprises that are on a trajectory of rapid growth—despite a relatively gloomy global economic outlook for 2023.

Here's why.

With its strategic location as a gateway to Europe, Ireland offers a robust economy, a highly skilled labor force and positive commercial outlook during a relatively contractionary period worldwide.

"Our investors talk to us about a very productive workforce and environment that gives them a very attractive return on an investment," says Kieran Donoghue, Global Head of Strategy, Public Policy & International Financial Services at IDA Ireland, the government's inward investment agency. "These investors talk about the adaptability and the flexibility of their staff, the resilience of their operations, which was demonstrated even more so during the pandemic. They talk about an environment that's very innovative."

Major tech companies, including Google, Facebook, Airbnb, PayPal, Microsoft, eBay, LinkedIn have set up their European headquarters in Ireland's capital—attracted by its tax incentives for research and development, highly skilled, English-speaking workforce, welcoming culture, regulatory environment and world-leading connectivity.

Leo Clancy, CEO of Enterprise Ireland, the government agency responsible for the development of Irish enterprises in world markets, believes this is because Ireland is "starting from a very good place" despite macroeconomic uncertainty. "The Irish economy has performed really well throughout the pandemic period, and continued to perform well as the market rebounded," he says. "We have full employment—2.6 million people employed for the first time ever in the economy—and growth across all sectors. Things are uncertain globally, but I'd rather start from here than anywhere else."

Ireland's Business Landscape: A Snapshot

12.5%	Corporate tax rate for companies in Ireland.
37.5%	Total possible tax relief on R&D investments*.
63%	Workforce aged 25 to 34 with tertiary qualification.
36.9%	Undergraduates enrolled in science, technology, engineering and math (STEM) degrees.
18%	Growth rate of startups in Dublin year-on-year.

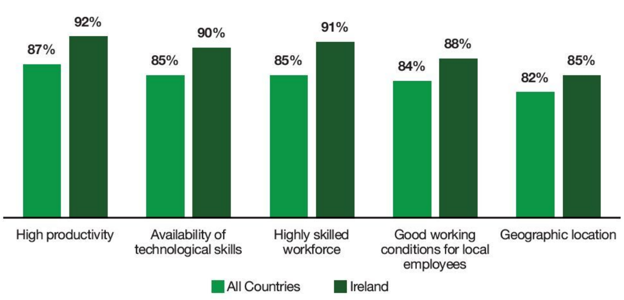
*This includes a tax credit of 25% for expenditure incurred on qualifying R&D activities and the standard 12.5% revenue deduction available for the R&D expenditure. Ireland is set to adopt the OECD global minimum effective corporation tax rate of 15% for multinationals with revenues in excess of $811 million (€750 million).

Boosting the best of Ireland: Exports and FDI

Of the 1,800 multinational firms that currently operate in Ireland, the number of people employed in those companies increased by 9% last year, accounting for more than €300 billion ($321 billion) in annual exports. "When you consider that portfolio, that group of companies on average invest €30 billion ($32 billion) in the economy each year. That's in wages and salaries and purchases of Irish materials, goods and services," says Donoghue. "Then they probably invest another €9 billion ($9.62 billion) in capital expenditure when they're reinvesting in their Irish operations. That's a very significant economic contribution to the country, and we're estimated to grow GDP this year by about 4%."

Globally, investors are placing greater emphasis on human capital than ever before. According to Bloomberg Media's FDI study, investors considering Ireland as an FDI destination cited the workforce's technological skills (90%) and high productivity (92%) as some of the most important investment factors, far outpacing the global average (85% and 87% respectively).

The Most Important Human Capital Factors for Investing in Ireland



Source: Bloomberg Global FDI Study 2022
Q: On a scale of 1 to 5, where 1 means "not important and 5 means "critically important", please indicate how important each of the conditions mentioned below are for your foreign direct investment decisions? Quite important and Extremely important

"Companies also see the opportunity to partner with academics and researchers in our university system to feed a pipeline of ideas that could lead to new products or services. It also gives them exposure to a talent pool that they could potentially hire to work in the R&D centers they're setting up here," says Donoghue.

As the world enters a shaky second quarter of 2023, Ireland stands out as a vibrant location for thousands of domestic businesses that are poised for fast expansion alongside some of the world's largest multinational corporations.

IDA Ireland
in collaboration with ENTERPRISE IRELAND

Bloomberg Businessweek

April 10, 2023

◀ The London casino where a mysterious Croatian gambler enjoyed an improbable run at a roulette table in 2004

JAMES VEYSEY/CAMERA PRESS/REDUX

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How did Niko Tosa do it? A timer? A microprocessor? Or just instincts?

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CORRECTION

Agenda in the April 3 issue referred to the Royal Bank of Australia. There is no such institution: It is the Reserve Bank of Australia that sets interest rates Down Under.

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■ COVER TRAIL

How the cover gets made

❶

"So this week's story is all about roulette!"

"Will I learn how to win back my retirement savings?"

"Yeah, no. No, you won't."

"Hmm... should we do a blackjack story instead?"

"Let me strongly recommend you look at our section (page 25) about what to do with your money now that—"

"Yeah, yeah, OK. Back to the roulette thing."

"The story's about a guy who cracked the roulette code."

"Yes! Tell me more."

"He'd scope out a casino, find a roulette wheel he liked and then proceed to win at an astonishing rate."

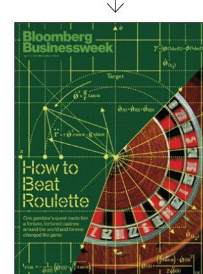
"Taking notes. What's his number?"

"Can we get back to the visuals?"

"Oh, of course. I picture *A Beautiful Mind* meets *Good Will Hunting* with a dash of *Ocean's 11* and a hint of *Casino Royale*."

"Great! Can't wait. Now please promise me you'll at least *look* at the money section?"

"Sure, yeah. I'll read it on the flight to Vegas."



Cover: Photo illustration by Irene Suosalo; photo: Getty Images

FINANCE: BRYAN VAN DER BEEK/BLOOMBERG

● Trump in Court

On April 4, Donald Trump was arrested and arraigned at the Manhattan Criminal Court in New York. The former president pleaded not guilty to 34 felony counts of falsifying business records. Court watchers say future cases pose even more legal peril for him.

► A special counsel, Jack Smith, is investigating efforts by Trump and his allies to overturn his loss to Joe Biden in 2020 and interfere with the election's certification on Jan. 6, 2021.

► Smith is also looking into Trump's handling of scores of classified documents he took from the White House to his Florida home, Mar-a-Lago, which he failed to hand over even after getting a subpoena.

► In Georgia, Atlanta District Attorney Fani Willis is investigating whether Trump broke the law in his attempts to overturn the state's 2020 results. He has denied wrongdoing in all of these cases.

● "We cannot and will not normalize serious criminal conduct."

Manhattan District Attorney Alvin Bragg, accusing Trump on April 4 of concealing a $130,000 hush money payment that Michael Cohen, his fixer, made to adult-film actress Stormy Daniels during the 2016 presidential campaign to hide an affair she had with the candidate. Prosecutors say his company obscured reimbursements to Cohen by characterizing them as legal expenses.

● Finland officially joined NATO on April 4.

Sweden is likely to follow suit in the coming months. Russian President Vladimir Putin has long claimed that he invaded Ukraine to ward off NATO expansion. With Finland's accession, the alliance's land border with Russia more than doubled, to 2,551 kilometers (1,580 miles).

● UBS plans to lay off

36k

workers worldwide. The cuts will reduce the combined workforce of UBS and Credit Suisse by as much as 30%. At UBS's annual meeting on April 5, Chairman Colm Kelleher told shareholders that integrating the banks will take three to four years.

● Johnson & Johnson agreed to pay $8.9 billion to resolve all cancer lawsuits tied to its talc-based powders.

The company hopes to settle more than 40,000 current suits and fund a trust set up in US bankruptcy court in New Jersey to cover future claims, it said on April 4 in a securities filing.

● Japan is expected to increase its spending on chipmaking gear by 82% in 2024, to about

$7b

according to data from SEMI, a global association of chipmaking equipment producers.

● Peter Murrell, husband of Nicola Sturgeon, was arrested on April 5.

The former Scottish National Party CEO was questioned by detectives probing the SNP's finances. He and Sturgeon, who led the party and Scotland for almost a decade, both stepped down in March. Murrell was released without charge pending further investigation after 11 hours in custody, Police Scotland said. The arrest risks unraveling the separatist party just as the UK's next general elections come into view.

● LSU's Flau'jae Johnson holds up the championship trophy on April 2 in Dallas after the Tigers defeated the Iowa Hawkeyes, 102-85, in the final of the 2023 NCAA Women's Basketball Tournament.

COURTROOM: JANE ROSENBERG/REUTERS/REDUX. FLAG: THIERRY MONASSE/GETTY IMAGES. BRAGG: STEPHANIE KEITH/BLOOMBERG. LSU: TOM PENNINGTON/GETTY IMAGES. ILLUSTRATION BY ANDREA BOJKOVSKA

April 10, 2023

How to Fix Banks To Prevent Future Failures Like SVB's

The first US banking crisis in more than a decade has regulators facing a very public reckoning: To what extent are they to blame for a rash of failures that's shaken confidence in the financial system? And how can they make things right?

The recent turmoil has been a study in bank mismanagement. For most of 2022, Silicon Valley Bank had no chief risk officer. Other executives willfully ignored glaring vulnerabilities: an extreme reliance on flighty uninsured deposits, combined with investments in long-term government bonds that declined in value as interest rates rose and effectively guaranteed steep losses if the bank were forced to sell. Despite repeated warnings from regulators starting in 2021, the bank did nothing until it was too late.

No doubt supervisors could've pushed harder. If they had issued a public reprimand before SVB's problems became a significant threat, the bank might well have survived. In many cases, regulators have been too willing to leave such issues unresolved: As of mid-2022, the 10 US banks in SVB's size category had more than 100 warnings outstanding. Still, it would be folly to demand that officials anticipate everything that could go wrong or micromanage thousands of institutions to ensure that none failed.

What else can they do? Regulators have already signaled some changes aimed at addressing the weaknesses that SVB revealed. They'll likely reimpose big-bank rules, including more frequent stress tests, on institutions with assets between \$100 billion and \$250 billion (like SVB)—a group that Congress freed of such burdens only five years ago. They might also reconsider the implications of how fast deposits can run in an age of smartphone apps and social media, and how even the safest long-term bonds, given their sensitivity to interest rates, should figure into liquidity and capital requirements.

Yet such tweaks won't solve the broader problem. Banks will keep making mistakes, and the next one will almost certainly be different. What matters is that the system be prepared for whatever might happen: that banks have the necessary financial strength and that depositors won't overwhelm them by bolting at the slightest provocation.

One crucial safeguard is equity capital, the money that shareholders put at risk. Unlike debt, capital absorbs losses in bad times, making institutions and the entire system more resilient. Banks have more than they did before the 2008 financial crisis, but still nowhere near what's needed. Efforts to correct this should reemphasize simple measures of equity to assets, as opposed to regulatory measures that attempt to weight assets according to their riskiness. After all, crises tend to happen when purportedly safe investments go bad.

Beyond that, the government should seriously consider making its implicit guarantees official by increasing the \$250,000 limit on deposit insurance and adjusting banks' premiums accordingly. Done right, this could obviate the need to devise emergency fixes after runs have already started. Yet such a change should be balanced by measures to mitigate the cost of insurance, such as ensuring that banks have ample loss-absorbing capacity to protect depositors, and possibly limiting the sheer volume of run-prone instruments that financial institutions can issue.

SVB's failure has delivered a valuable reminder: Even a seemingly isolated event can threaten the financial system if enough people think it does. That's a troubling realization in an era when panic spreads fast and people appear willing to believe incredible things. The proper safeguards can drastically reduce the chances of disaster. Regulators should get to work. *For more commentary, go to bloomberg.com/opinion*

■ AGENDA

► Your Taxes Are Due, America

The deadline to file is April 18. The IRS will process about 166 million returns this year. Some kinks in the system may soon get ironed out: The Inflation Reduction Act of 2022 included \$33 billion over a decade to modernize the service.

► The US Fed's Open Market Committee publishes the minutes for its March meeting on April 12. The central bank raised the fed funds rate by 25 bps to 4.75%-5% on March 22.

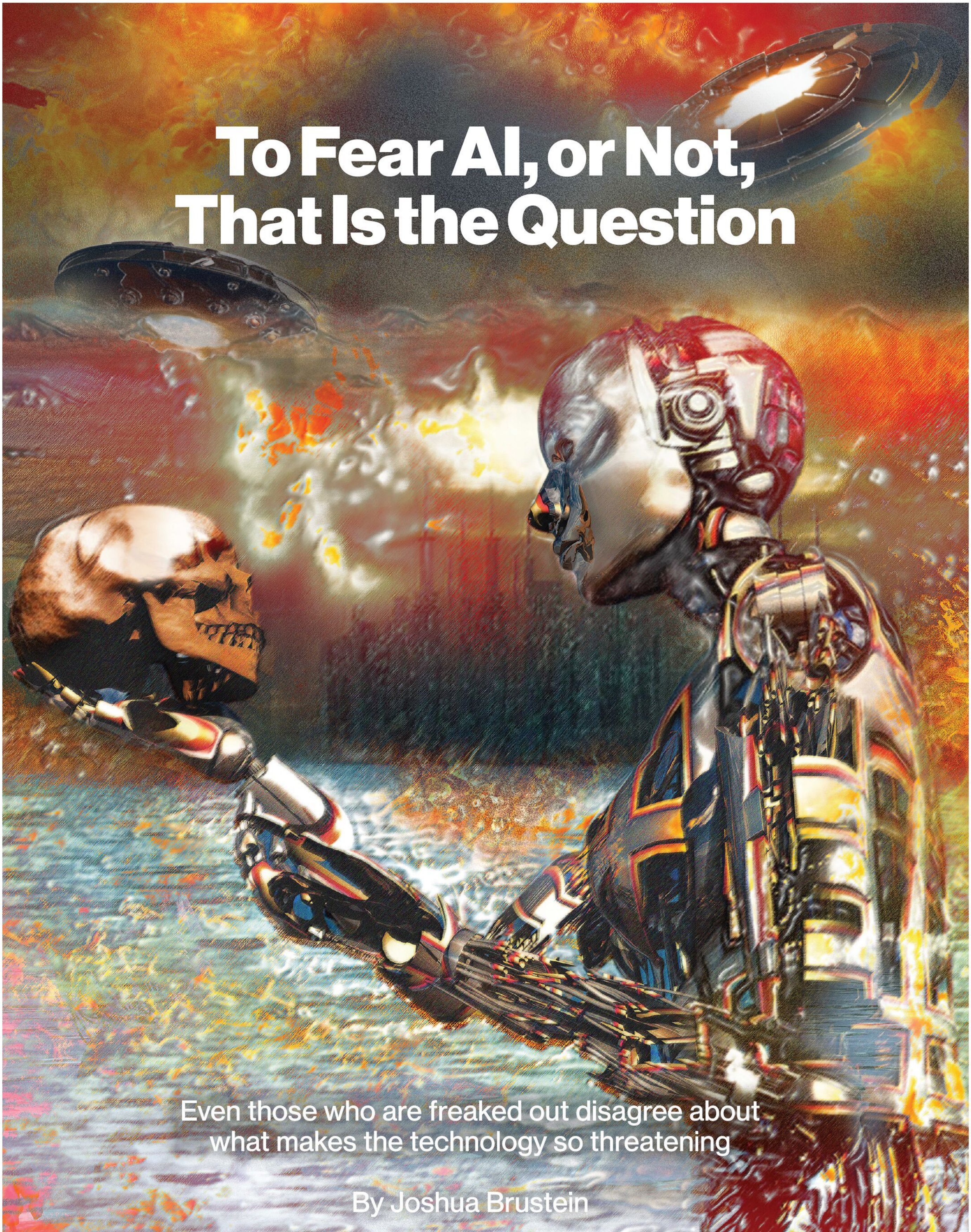
► The US Bureau of Labor Statistics reports on the state of inflation in March on April 12. Economists expect the year-over-year core rate to drop a bit from February's 5.5%.

► China's National Bureau of Statistics reports first-quarter GDP on April 17. Analysts forecast growth to edge back above 3% after dropping in the fourth quarter of 2022 to 2.9%.

► The Office for National Statistics releases its estimate of UK GDP on April 13. Look for the sputtering British economy to continue in stop-start mode for now.

► Albertsons and CarMax report earnings on April 11; Infosys, on April 20; Delta, on April 13; BlackRock, JPMorgan, Wells Fargo and Citigroup, on April 14.

► Billiards fans: The World Snooker Championship begins on April 15 at the Crucible Theatre in Sheffield, England. World No. 1 Ronnie O'Sullivan is the reigning champ.



To Fear AI, or Not, That Is the Question

Even those who are freaked out disagree about what makes the technology so threatening

By Joshua Brustein

PHOTO ILLUSTRATION BY 731; PHOTOS: ALAMY (5)

In January 2015 the newly formed—and grandly named—Future of Life Institute (FLI) invited experts in artificial intelligence to spend a long weekend in San Juan, Puerto Rico, laying out a written agenda for the field. The tone of the resulting documents was predominantly upbeat. An open letter acknowledged it was hard to predict what AI's exact impact would be—it laid out some potentially disruptive consequences—but also noted that "the eradication of disease and poverty are not unfathomable."

The open letter the FLI published on March 29 was, well, different. The group warned that AI labs were engaging in "an out-of-control race to develop and deploy ever more powerful digital minds that no one—not even their creators—can understand, predict, or reliably control." It called for an immediate pause on the most advanced AI research and attracted thousands of signatures—including those of many prominent figures in the field—as well as a round of mainstream press coverage.

For anyone trying to wrap their heads around the current freakout over AI, the letter was instructive on multiple levels. It's a vivid example of how the conversations about advanced technologies can shift with jarring speed. The vibe in Puerto Rico in 2015 was positive and collegial, says Anthony Aguirre, the FLI's vice president and secretary of its board, who attended that conference and helped draft the recent letter. "What there wasn't then was giant companies competing with one another," he says.

Looking back, the risk that self-interested technology companies would come to dominate the field seems obvious. But that concern isn't reflected anywhere in the documents from 2015. Also absent was any mention of the industrial-scale dissemination of misinformation, an issue that many tech experts now see as one of the most frightening consequences of powerful chatbots in the near term.

Then there was the reaction to last month's letter. Predictably, leading AI companies such as OpenAI, Google, Meta Platforms and Microsoft gave no indication it would lead them to change their practices. The FLI also faced blowback from many prominent AI experts, partially because of its association with the polarizing effective altruism movement and Elon Musk, a donor and adviser.

Aside from any intra-Silicon Valley squabbles, critics thought the FLI was doing damage not for voicing concerns, but for focusing on the wrong ones. There's an unmistakable tinge of existential threat in its letter, which explicitly raises the prospect of humans losing control of the civilization we've built. Fear about computer superintelligence is a long-standing topic within tech circles—but so is the tendency to vastly overstate the capabilities of whatever technology is the subject of the latest hype cycle (see also: virtual reality, voice assistants, augmented reality, the blockchain, etc.).

Predicting that AI will end poverty and warning that it could end human civilization seem to reside on opposite ends of the techno-utopian spectrum. But they actually both promote the view that what Silicon Valley is building is far more powerful than laypeople understand. Doing this diverts from less sensational conversations and undermines attempts to address the more realistic problems, according to Aleksander Madry, faculty co-lead of Massachusetts Institute of Technology's AI Policy Forum. "It's really counterproductive," he says of the FLI's letter. "It will change nothing, but we'll have to wait for it to subside to get back to serious concerns."

The leading commercial labs working on AI have been making major announcements in rapid succession. OpenAI released ChatGPT less than six months ago and followed with GPT-4, which performs better by many measures but whose inner workings are largely a mystery to people outside the company. Its technology is powering a series of products released by Microsoft Corp., its biggest investor, some of which have done unsettling things, such as professing love for human users. Google rushed out a competing chatbot-powered search tool, Bard. Meta recently made one of its AI models available to researchers who agreed to certain parameters—and the code quickly showed up for download elsewhere on the web.

OpenAI, despite its name, has become a leading proponent of the need to keep the technology closely guarded, taking the view that a primary danger is AI spreading in this way. The company has said it can anticipate a future in which it submits models for independent review, or even agrees to limit its technology in key ways. But it hasn't said how it would decide to do this. It's hard not to notice how well its cautious approach dovetails with its commercial interests, as regularly pointed out by critics who say OpenAI is making it harder to do independent research on artificial intelligence.

Some rivals also take shots at OpenAI's approach. "Speaking as a citizen, I always get a little bit quizzical when the people saying 'This is too dangerous' are the people who have the knowledge," says Joelle Pineau, vice president for AI research at Meta and a professor at McGill University.

Meta allows researchers access to versions of its AI models, saying it hopes outsiders can probe them for implicit biases and other shortcomings. Pineau lauds that kind of work, but also acknowledges the speed at which the code became available was troubling. "We're not thrilled about the leak," she says.

There may never be a definitive answer about whether OpenAI or Meta has the right idea—the debate is only the latest version of one of Silicon Valley's oldest fights. But their divergent paths do highlight how the decisions about putting safeguards on AI are being made entirely by executives at a few large companies.

This has clear echoes of the rise of social media, another disruptive technology that developed with scant regulation. While AI is far different from social media, many of the players involved in this gold rush were around for that one, too. The services were deeply entrenched by the time policymakers began trying to respond in earnest, and they've arguably achieved very little. In 2015 it still seemed like there was lots of time to deal with whatever AI would bring. That seems less true today. Ⓑ

1

BUSINESS

How Cheaper Insulin Protects Drug Company Profits

● Limits on copays help patients but threaten growth of less expensive alternatives

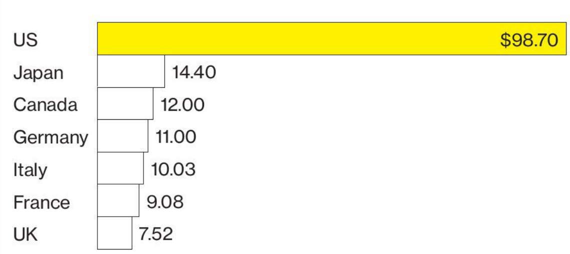
After years of complaints about runaway drug costs, pharmaceutical companies are finally reducing the price of insulin. On March 1, Eli Lilly & Co. slashed some versions by 70%. Two weeks later, Novo Nordisk A/S and Sanofi SA responded with similar cuts. Just as important for diabetics, who often pay hundreds of dollars monthly for the vital medication, Lilly and Sanofi instituted policies aimed at capping copays–what patients must shell out at the pharmacy counter–to $35 per month for many versions.

While all this is undeniably great news for people with diabetes, industry watchers say that in the long run, limits on out-of-pocket payments risk propping up insulin prices, not cutting them. The changes threaten to tamp down competition from new, cheaper alternatives known as biosimilars, keeping insurance premiums high and preventing the rivals from gaining traction, according to Robin Feldman, a law professor at the University of California College of the Law at San Francisco. "It looks like a gift to the patient, but the costs to the plan, not to mention the health-care system, are carefully camouflaged," she says.

Since Lilly developed the first commercial insulin a century ago, it's become one of the world's most sought-after drugs, helping diabetics control blood sugar when their bodies either don't produce enough of the glucose-regulating hormone or are resistant to it. US Medicare spending on insulin topped $13 billion in 2017, up more

Insulin Prices

Average price of a vial in 2018



DATA: RAND CORP.

Edited by David Rocks

ILLUSTRATION BY ASYA DEMIDOVA, BUETTNER: NEETA SATAM/BLOOMBERG than eightfold from a decade earlier. In 2018 the average US list price for a 10-milliliter vial of insulin—enough for anywhere from a few days to a month, depending on the severity of a person's disease—was $98.70, more than five times the level in other developed countries, because of a lack of transparency in pricing and the US government's limited power to negotiate costs.

In 2010 the Affordable Care Act opened the door to so-called biosimilar drugs, nearly identical copies of brand-name formulas, akin to the generic versions of less complex medications. But competition has been slow to emerge, with just two biosimilar insulins approved so far: cheaper versions of Sanofi's Lantus, from Lilly and Viatris Inc. A Utah-based nonprofit called Civica Rx says it's developing versions of Lantus as well as insulins from Lilly and Novo that will cost about $30 a vial when they reach the market next year.

But given a choice between a brand name they've used for years and an unknown alternative, many patients will choose the original if there's little or no difference in cost. So even though the list price of the most popular insulins from Lilly and Sanofi stands at about $65 after the cuts, the $35-per-month limit on copays will make the brand-name drugs more competitive with biosimilars. Insurers cover everything beyond the copay, so "everyone pays the higher cost" through elevated premiums, says Sean Dickson of America's Health Insurance Plans, an industry lobbying group. Lilly, Novo and Sanofi say cutting copays makes products more affordable for patients, but they didn't address criticisms of the strategy's effect on competition.

Insurers and pharmacy benefit managers could set lower copays for biosimilars, but they have incentives not to, says Leemore Dafny, a professor at Harvard Business School. That's because pharmacy benefit managers collect payments from drug companies in exchange for listing certain medications as the preferred choice for patients, and those rebates are smaller on lower-priced medicines. "You're not going to have much margin to give any rebates," Dafny says.

Kasia Lipska, an endocrinologist and associate professor at the Yale School of Medicine, says the price reductions and caps on out-of-pocket costs are "long overdue." But ultimately, "these steps are defensive on the part of drug manufacturers," she says. "They are trying to stay in the market and to hold on to the monopoly they have on insulin."

—Ilena Peng, with Robert Langreth and Emma Court

THE BOTTOM LINE Many patients will choose a brand name over an unknown alternative if there's little difference in price, so caps on copays can keep the original drugs competitive with newcomers.

A Trader Turns To Food Science

● Ag merchant Bunge is helping develop new recipes for fast-food chains and packaged-goods purveyors reeling from war

When agricultural exports through the Black Sea plummeted following Russia's invasion of Ukraine, big food companies suddenly found themselves scrambling to find alternative sources of grains and oilseeds. But processed foods these days are complex mélanges of stabilizers, additives, preservatives, sweeteners, salt and flavorings in addition to basic ingredients. So a shift in one component—even changing the provenance of the sunflower oil—can require tweaking the entire recipe to maintain the precise taste and texture consumers expect.

● Buettner

For Bunge Ltd., a 205-year-old agricultural trading house, that presented an opportunity. In the past five years, the company has quintupled spending on research aimed at helping fast-food chains and packaged-goods purveyors such as Unilever Plc and Lotte Corp. develop new recipes and quickly adapt old ones if they need to pivot to a different source or change ingredients.

Today, Bunge (BUN-ghee) has 15 "innovation centers" in nine countries, with more than 200 food scientists working on such initiatives. "We had a big customer base reliant upon those commodities that we had planned to bring in from the Black Sea," Aaron Buettner, Bunge's president of food solutions, says while sampling the company's vegan meatballs and nachos at its headquarters in St. Louis. "Our European team was working on conversions and tests seven days a week."

"We had to organize a response customer by customer"

It was the near-halt in exports of sunflower oil from Russia and Ukraine that did the most damage, because the oil's high smoke point and neutral taste and color are hard to replicate. Although Buettner wouldn't disclose details, he says Bunge was able to shift some customers to sunflower oil sourced from western Europe or Argentina. And Bunge's food scientists helped others—producers of breads, salad dressings, chips, cookies and more—replace sunflower with canola or palm oil. "We had to organize a response customer by customer," Buettner says.

Bunge operates the world's largest network of crushing facilities, processing crops such as soybeans and canola and sunflower seeds for oil and ▶

◀ animal feed. But it was its network of testing and research centers, which complement its more traditional trading assets such as port terminals and grain elevators, that helped the company weather the disruptions from the war—and win 150 new customers seeking alternatives to sunflower oil. Although Bunge has lagged behind some rivals in developing food technologies, "it's now clear that the company is on point to catch up," says food industry consultant Henk Hoogenkamp.

In 2017, Bunge opened a 40,000-square-foot innovation center near St. Louis with milling equipment, ovens, stovetops and fryers that mimic the facilities of fast-food chains. There's a gourmet kitchen where chefs prepare offerings such as cakes, ice cream and plant-based sausage made with ingredients Bunge has developed to mimic the texture and flavor of butter and other animal fats. And in a suite of about a dozen cubicles, morsels of new concoctions are passed through small hatches to tasting specialists while the lights shift through a palette of greens, blues, reds and yellows to reduce any bias that appearance might have on the perception of flavor.

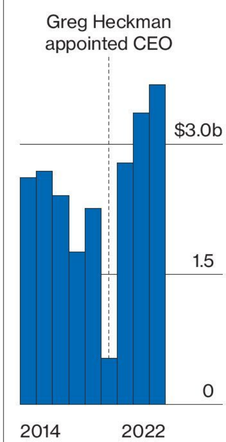
For most of its existence, Bunge was primarily a grain merchant, competing with the likes of Archer-Daniels-Midland, Cargill and Louis Dreyfus. The company was founded in 1818 by Amsterdam importer Johann Bunge, and seven decades later it allied with another family to start trading grains. It expanded to Latin America in 1884 and the US in 1923. The company has since repeatedly shifted its headquarters—to Argentina, Brazil, New York and, three years ago, St. Louis.

But trading is a tough business with thin margins and high risks. In 2018 a bet on soybeans that went bad because of the US trade war with China led to a surprise quarterly loss, fueling a 20% drop in Bunge's stock and a push by activist investors at D.E. Shaw & Co. and Continental Grain Co. to force change. The board soon ousted Chief Executive Officer Soren Schroder and replaced him with Greg Heckman, who has cut costs, sold underperforming businesses, focused on risk management and kick-started growth. "This team came in with a pretty clear vision of wanting to shed noncore or unproductive assets," says Stephens Inc. analyst Ben Bienvenu.

Bunge's sales of renewable diesel, which it makes from cooking oils in partnership with Chevron Corp., have surged, helping push revenue of its refined and specialty oils business from $9.1 billion in 2019 to $16.8 billion last year. With rising profits, Bunge's stock price has almost doubled under Heckman, and in March its shares were added to the S&P 500. The CEO is now sitting on a pile of cash he says he'll use for acquisitions that "fill in any weaknesses that we have and continue to build on our strengths." And he says he aims to expand into sustainable aviation fuel, a market that could approach $15 billion annually by 2030, according to researcher Brainy Insights, though the technology is far from mature. "It's too big to be ignored," Heckman says.

Although demand for ersatz meat is starting to slow, its popularity has been a boon for Bunge, helped by its 2018 acquisition of 70% of vegetable oil producer Loders Croklaan for $946 million. That company, which has invested heavily in alternative proteins and plant-based replacements for animal fats, dramatically boosted Bunge's capabilities in those areas and lifted its ability to help customers reformulate recipes in response to the shifting availability of ingredients.

▼ Bunge gross profit



▲ Preparing vegan nachos at a Bunge "innovation center"

With Russia's war in Ukraine dragging on, global supplies of cooking oils remain tight, and Bunge aims to continue helping buyers find the sources they need. Although the rate of growth will likely slow from the past few years, food solutions boss Buettner says the business will continue to expand faster than the overall industry. "Obviously this connects to our core value chain in terms of our presence in oilseeds," he says. "There are a lot of interesting product-development problems to solve." —*Tarso Veloso Ribeiro and Isis Almeida, with Siddharth Vikram Philip*

THE BOTTOM LINE Bunge has 15 "innovation centers" in nine countries, with more than 200 scientists helping food companies pivot to different sources or change ingredients.

NEETA SATAM/BLOOMBERG. DATA: COMPILED BY BLOOMBERG

Stocks

10 Companies to Watch

Following our list of 50 Companies to Watch in January, we're back with 10 specifically for the second quarter based on scenarios from Bloomberg Intelligence. The companies in the spotlight span sectors and regions and are part of a larger group of high-confidence Focus Ideas that BI analysts identify on an ongoing basis. Each scenario outlines important catalysts in the coming months that support our case. —*Tim Craighead*

● AIA

The life insurer is poised for a recovery in new policy sales as China reopens. Purchases of policies by mainland visitors to Hong Kong seeking to diversify their investments evaporated in recent years; BI's scenario analysis points to a 40% resurgence in 2023, almost double the consensus estimate.

● BBVA

Spain and Mexico are the core of the Spanish bank's business, and BI's analysis suggests the consensus expectations underestimate the benefits to its interest margin in the former and loan growth in the latter. And the market appears overly worried about BBVA's Turkish operations, which provide just 7% of its profit.

● Capgemini

Europe's biggest IT services provider is well placed to help companies navigate transformations in areas such as the cloud and digital. Its record order backlog informed BI's expectation of a 2023 revenue boost topping 10%, vs. the consensus of 5% and management guidance of 4% to 7%.

● Casey's

Expectations for the convenience store operator appear too optimistic as high inflation and constrained real incomes make it likely that consumers will trade down to lower-priced products. And as Casey's expands beyond its core markets in the US Great Plains, it risks suffering from low brand recognition.

● Gap

BI says a new CEO—to be announced soon—will accelerate crucial changes. Old Navy, accounting for about half of sales, has made significant shifts in its lineup and cleared out old inventory, setting the stage for recovery. And Banana Republic's successful reinvention offers a blueprint for reenergizing the Gap brand.

● GFL

This Canadian waste company has become North America's No. 4 environmental services provider through acquisitions. BI believes that growth will slow and estimates that cash flow will disappoint by 7% or more this year. Rising interest rates, high debt and low prices for recycled materials risk crimping purchases and profits.

● Hong Kong Exchanges

HKEX is poised to benefit from tailwinds that consensus views don't fully appreciate. It operates with significant fund balances that are sensitive to rising interest rates, and BI's analysis points to a positive surprise in investment income. China's reopening also means more Hong Kong initial public offerings.

● Skechers

The shoemaker is poised to deliver sales increases that beat expectations. Its investments in an e-commerce platform and loyalty program and distribution success during the past few years are key to its bright outlook, according to BI. Its sales approach and expansion into new markets are poised to push growth above 10% for 2023.

● Ulta

Beauty routines are proving to be a priority for consumers as the return to office gains pace, so Ulta's chain of US stores is sitting pretty. A BI survey suggests that management guidance of 4% to 5% same-store sales growth in 2023 is far too low as Ulta adds stand-alone outlets and expands a partnership with Target.

● Vestas

As a global leader in wind turbines, the Danish company is poised to benefit from increased funding for greener energy projects on both sides of the Atlantic. And steel prices, a key cost, have fallen, improving Vestas's profit margin. BI's analysis points to 2024 operating profit that's about 25% better than consensus.

Apple Moves Beyond China

Tim Cook spent decades building ties to the country. Now he's looking elsewhere

In late March, when Tim Cook made his first public appearance in China since the onset of the Covid-19 pandemic, Apple Inc.'s chief executive officer approached it with all the delicacy of a high-stakes diplomatic visit. Cook took colleagues to an Apple retail store in Beijing and met privately with high-ranking government officials to discuss the company's operations. "This has been a symbiotic kind of relationship that I think we both enjoyed," he told the audience at a state-sponsored technology conference, in an appearance at which he also announced the expansion of a multimillion-dollar rural education program in the country.

One of the signature achievements of Cook's career at Apple has been his work crafting its relationship with China, which is unusually positive compared with those of other US tech companies. Over more than two decades, Apple has built a vast manufacturing and assembly operation in the country involving thousands of business partners. There are more than 40 Apple stores in mainland China, and Apple draws almost 20% of its revenue from its "Greater China" region, which includes Taiwan and Hong Kong.

But Apple's China formula is under its greatest strain in recent memory. Even as Cook was

PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (2). DATA: BLOOMBERG INTELLIGENCE

Edited by Joshua Brustein

smoothing things over in Beijing, Apple executives were hard at work developing ties to other countries to lessen reliance on China, according to multiple people familiar with Apple's operations who spoke on the condition of anonymity, since they're not authorized to speak publicly. The company declined to comment.

Apple's diversification efforts took on urgency during heightened trade tensions between the US and China under the Trump administration and then intensified during the pandemic. In 2020, Cook said any changes to Apple's supply chain over Covid would probably amount to little more than "adjusting some knobs." Clearly, something far more sweeping is afoot.

Apple's efforts center on India as a location for production of iPhones and accessories, Vietnam for AirPods and Mac assembly, Malaysia for some desktop Mac production, and Ireland—where suppliers currently build the relatively easy-to-produce iMacs—for a range of simpler products. Managers in Apple's operations department have instructed employees to focus on sourcing additional components and locating production lines outside China for more new products coming in 2024, though the company also plans to retain extensive operations in the country.

With Cook's direct involvement, Apple has also assembled hundreds of employees into what some people within the company have called "tiger teams" to address weaknesses in its supply chain. It has expanded the efforts of these teams, which set up shop in suppliers' factories in China and other countries, assess facility maintenance schedules, and assemble more extensive lists of backup suppliers for every component, right down to screws and plastic inserts. The company is working to improve its forecasts, component by component, to better anticipate potential shortages.

Apple is also exploring ways to reduce its reliance on Taiwan, where chipmaking giant TSMC Ltd. makes many of the semiconductors crucial to all its products. That effort, prompted by concerns over geopolitical tensions centering on Taiwan, has started slowly; Apple is gearing up to produce a minuscule number of chips at a TSMC plant in Arizona starting next year. Shifting chip production could be even more challenging than relocating device assembly, however, given the lack of clear alternatives to Taiwan's capacity. It's also arguably even more critical. One person with knowledge of Apple's operations predicts that if chip production there went down, it would take almost a year to ramp component production back up.

Still, the company is moving carefully. Apple's leadership is concerned that China might retaliate if it moves too much capacity to other countries, or transitions too rapidly. Customers in China could turn against US-designed products amid heightened nationalism. The company also has concerns about its ability to ensure high standards of quality in Vietnam and particularly Malaysia, given the current state of the manufacturing industries in those countries.

There's also a delicate balance to maintain within Apple itself, where different teams have contrasting priorities and objectives. Its procurement team, which sources parts, can scour the world for the necessary components, but much of the work of establishing production in a new geographic location falls to its manufacturing operations team, which needs to allocate significant human and financial resources to setting up new final-assembly production lines. The company's product development teams may also push back on the potential quality or feature omissions necessitated by assembly outside of China. "There are trade-offs between diversification and engineering," says a person close to these discussions.

Experiments in relocating some manufacturing and assembly operations have been going on within Apple for more than a decade. In 2012 it partnered with Foxconn, its biggest contract manufacturer, to make some iPhone models in Brazil to circumvent tariffs on imported goods. The following year, in response to domestic political pressures, Apple began making Mac Pro computers at a Flex Ltd. factory in Texas. Neither project went smoothly. Apple has cut back on Mac Pro production in the US and now does only token assembly of the devices in the country.

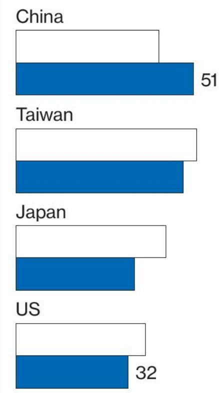
A more durable shift began in 2017, when Apple began making some low-end iPhones in India. On balance, it wasn't doing much to weaken its ties to China at that time; a Bloomberg Intelligence analysis found that the number of Chinese suppliers rose from 2017 to 2020, while the number of suppliers dropped in some other countries. These operations, which have been slowly developing since then, are now the foundation for much of the company's effort to make its signature products outside of China.

Apple managed to get through the beginning of the pandemic relatively unscathed, but the challenges piled up as Covid dragged on. In 2022 the company encountered significant delays and shortages for its most important launches. The revamped MacBook Air was delayed by several weeks after Covid spikes shut Quanta Computer Inc. factories. The Foxconn factories where the ▶

▼ Apple manufacturing suppliers

☐ 2017

■ 2020



● Number of iPhones Apple made in India in 2022

6.5m

◀ company's new iPhone 14 Pro devices are made were shut for the same reason, leading to supply complications extending into 2023. Apple's revenue in 2022's holiday quarter dropped for only the second time in the iPhone era.

The trouble at Foxconn highlighted the risk of sweeping disruptions that would test Apple's ability to keep churning out products and validated existing plans to spread operations geographically. Its most ambitious plans are for India, where it will work with a swath of partners to make iPhones, AirPods and Apple Pencils, as well as components for the Apple Watch, iPad and Mac. Apple has already tapped three of its main assembly partners from Taiwan to build devices in India: Foxconn, Pegatron and Wistron. It also recently brought on an additional key supplier in India, Tata, to build iPhone exteriors and ultimately assemble the whole product.

Apple produced more than 6.5 million of the 200 million iPhones it made in 2022 in India; it aims to produce 10 million units there in 2023. People involved in the process believe that the number could exceed 15 million next year; some think Apple could move as much as 25% of iPhone production to India by 2025 if it sticks to the most aggressive timeline. It's also had early discussions about moving iPad and Apple Watch production there, but such moves are unlikely in the near term, say people with knowledge of the plans.

The difference between Apple's standard and high-end phones are based in part on what materials are used to make them. Apple's highest-end phones, the iPhone 14 Pro and iPhone 14 Pro Max, have stainless steel enclosures; less premium models and older ones still in production use aluminum. The company has discussed moving the majority of aluminum iPhone production out of China. It has relocated a top iPhone enclosure-quality executive to the India operations after 15 years in China. Reversing a pandemic-era travel slowdown, Apple brass—including Rob York, a senior manufacturing executive responsible for churning out exteriors for the iPhone, Apple Watch and other devices, and Priya Balasubramaniam, who's responsible for the overall manufacturing of the iPhone and other devices—have been visiting India with increased regularity.

For the past few years, Apple has made the first batches of its most recent iPhone models in China, then gradually added production in India. It expects to ship the iPhone 15 from both countries simultaneously, which would be a first. (The iPhone 15 Plus and titanium iPhone 15 Pro models will still be made only in China.) The process of building iPhone 15 casings in India has begun, and components for the device are already being made locally by such suppliers as Jabil, which also plans to make Apple Pencil styluses and is already assembling AirPods enclosures. The company has had some problems with quality control at its Indian suppliers. Last year it approved Indian operations to make only certain models—deciding, for instance, that at least some suppliers could make black and starlight-colored iPhone SE models, but not red ones.

Apple is looking to build a wider range of components and products in India. Existing operations with such suppliers as Salcomp Manufacturing India Pvt Ltd. to make iPhone chargers, cables and boxes are expected to expand, and Apple is discussing establishing Indian production of metal and plastic parts, cover glass and screws.

Facilitating the creation of this kind of sprawling network of suppliers in China was a key to Cook's project of building Apple's capacity there. Now all he has to do is do it again. —*Mark Gurman*

THE BOTTOM LINE Some versions of the new iPhone may ship from Indian suppliers from the first day they're available, marking a major shift in the geography of Apple's supply chain.

Air Taxi Stations To Nowhere

● Flying taxi infrastructure is going up in Paris despite the lack of certified vehicles to use it

Alongside the tarmac at the Pontoise Aerodrome on the outskirts of Paris stands a sleekly modern building the size of a coffee shop with floor-to-ceiling windows. This is the Re.Invent Air Mobility test bed, Europe's first flying-taxi airport, or vertiport. To mark its inauguration in November, a shiny white electric vertical takeoff and landing (eVTOL) aircraft with an armature of 18 whizzing rotors lifted up, flew around under the guidance of its test pilot and then touched down again. With a little luck, a network of sites like this will anchor the world's first commercial flying taxi service, shuttling passengers between Paris's international airports and the venues of the 2024 Summer Olympic Games.

Or maybe a lot of luck. The Volocopter Volocity 2X flown at the ceremony in November is certified

● Walker

WALKER: COURTESY SKYPORTS. EVTOL: COURTESY VOLOCOPTER to fly only on an experimental basis. The entire vertiport plan relies on the aircraft achieving full certification, which would make it the first eVTOL to be authorized to carry passengers anywhere in the world. "It's on the ambitious side of what is possible," says Duncan Walker, co-founder and chief executive officer of Skyports, the UK-based company that's developing the project with Groupe ADP, the operator of Paris's international airports.

Building infrastructure for a form of transportation that's still largely hypothetical is a leap of faith, but probably a necessary one. After all, any air taxi system is going to need not only vehicles but also places where passengers can get in and out of them. "There are a lot of pieces that need to come together," says aerospace consultant Sergio Cecutta. "It's like baking a cake. If you mix up the ingredients the wrong way, the cake doesn't come out very well."

If the Paris plan succeeds, it will be a coming-of-age moment for a technology that—though it's attracted $13 billion in investment since 2010—has consistently fallen behind its most optimistic backers' timelines. It calls for a fleet of 10 Volocity aircraft to shuttle passengers along two routes: between Paris's two international airports and the Quai d'Austerlitz in the central city, and between the Issy-les-Moulineaux heliport in town and the Saint-Cyr l'École airfield near Versailles.

The idea is to use the Paris Olympics to pave the way for a permanent regional network, which a Group ADP spokesperson says should be fully operational "towards the end of the decade." Volocopter, based in southern Germany, is also working with partners to start service in Rome and Singapore in 2024 and Japan and Saudi Arabia the following year.

All these plans hinge on successfully introducing a working air taxi into service. Would-be manufacturers have been touting the imminent debut of their vehicles for years, but certification—or even demonstrating the ability to carry passengers from point A to point B—has remained elusive. Certifying any aircraft is a long and expensive process, and eVTOLs face a tougher challenge given their novelty and the way they push the limits of what is feasible using current engineering techniques.

Still, Volocopter is near the head of the pack of hundreds of aspiring eVTOL companies. Flying manned demonstrations since 2011, it's logged more that 1,500 flights. The design concept is essentially a scaled-up quadcopter. It's slower and smaller than some competitors' models, but it's also mechanically simpler, an advantage when it comes to certification and maintenance.

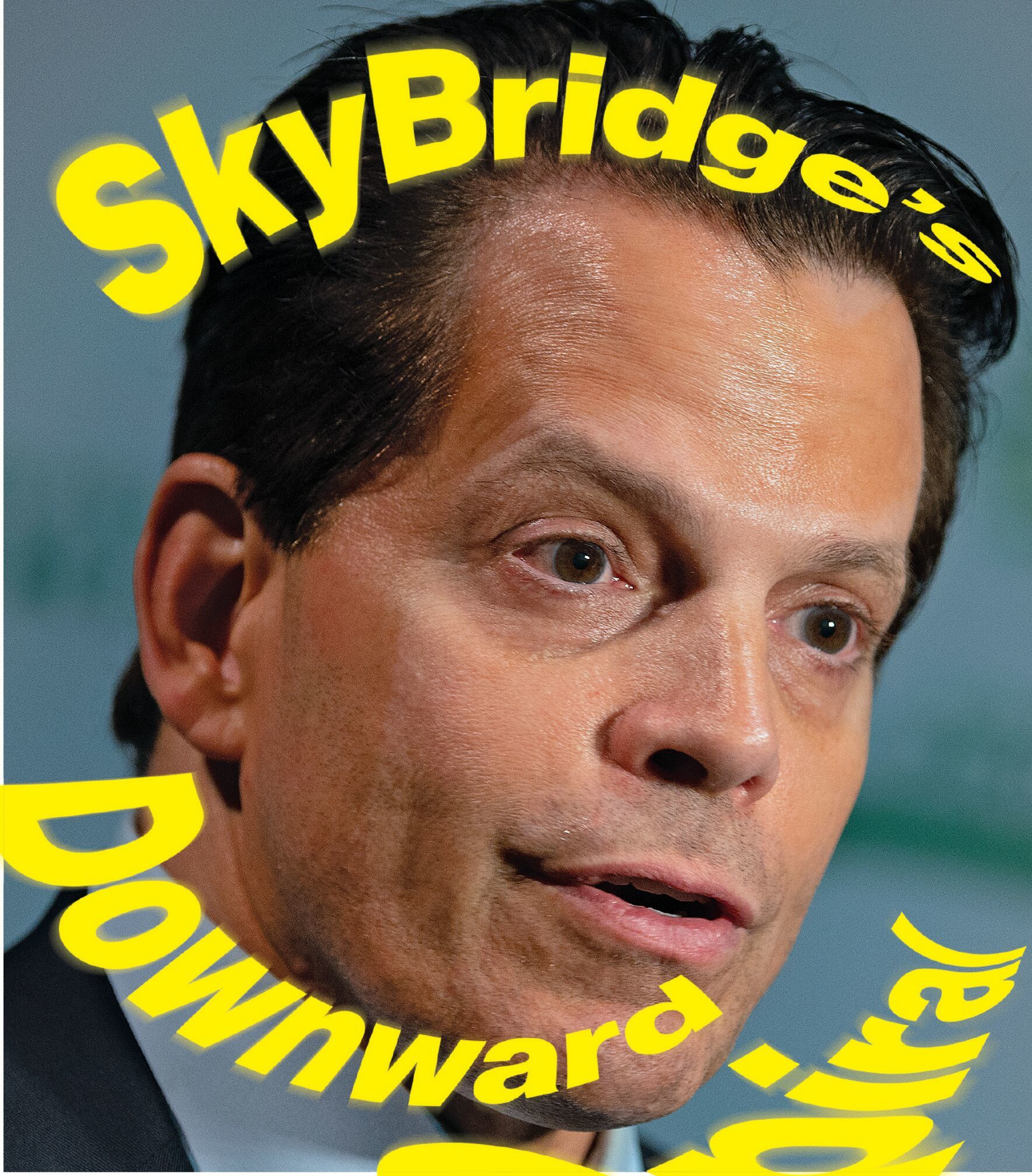
To be sure, the concept has its limitations. The Volocity 2X has just two seats, one for a pilot and one for a customer. Given that the aircraft are expected to make two to three flights per hour, and that each carries a single passenger, the system at the Paris Olympics would have a total daily capacity of no more than a few hundred passengers. The economics are essentially impossible, concedes Volocopter CEO Dirk Hoke. "No one can deny that," he says. "The advantage is, we will gain experience in operation while no one else is flying. We will be alone in the market."

▲ One of Volocopter's not-yet-certified air taxis

With typical startup optimism, Volocopter plans to develop autonomous flying capabilities, better batteries and other technology that will help it carry more passengers in each vehicle, a shift that could radically improve its financial prospects.

Even with a better pilot-to-passenger ratio, no one really knows if running eVTOL services profitably will prove possible. Among the major outstanding questions are what real-world operating costs will be, how much noise the machines will make and how much passengers will be willing to pay. Then, of course, there's the question of whether and where eVTOL aircraft will be allowed to fly. The test bed project at Pontoise aims to answer some of these questions, but the full picture will only emerge as commercial service gets underway. That means not only getting permission to start service during the Olympics, but also a go-ahead to stick around afterward. "It would be a failure for everybody," Walker says, "if there were flights at the Olympics, it got a lot of press, and then six weeks later there was no service." *—Jeff Wise*

THE BOTTOM LINE A plan to use the 2024 Olympics as a demonstration of the novel transportation faces regulatory challenges, and the economics are unresolved.



SkyBridge's Downward Spiral

● Investors are losing faith in Anthony Scaramucci's firm

On Jan. 31, Anthony Scaramucci sat onstage at a hedge fund conference in Miami, answering questions about, among other things, his former business partner Sam Bankman-Fried. Seven weeks earlier, Bankman-Fried had been arrested for allegedly stealing billions of dollars from clients of FTX, the crypto brokerage he founded. A few months before that, he'd bought a 30% stake in Scaramucci's SkyBridge Capital, which earns fees by investing in hedge funds and digital assets.

Despite the recent drama, the Mooch, as he's known, looked relaxed in a Brioni suit and Prada lug-soled loafers, his forehead Botoxed to a smoothness unnatural in a 59-year-old. "I'm not gonna let Sam or anybody, any bad outcome like that, dissuade me from further risk-taking or some big opportunities," he said. Or, as he'd put it on a recent episode of the finance podcast *Capital Allocators*: "I'm like a f---ing cockroach.…I'm a little tough son of a bitch, and so I will find a way hook or crook to make this work for the firm."

Scaramucci's irreverent humor and I'm-the-son-of-a-crane-operator persona have always helped him when things were looking down. He's perhaps most famous for being President Donald Trump's communications director for 11 days in July 2017 until he was fired following an expletive-filled interview with the *New Yorker*. He was sacked from his first job at the real estate investment banking unit of Goldman Sachs Group Inc. only to be rehired in sales, where he thrived. SkyBridge almost failed during the financial crisis, but Scaramucci buttressed the business by starting a hedge fund confab, the SkyBridge

Edited by Bret Begun and Pat Regnier

SCARAMUCCI: GETTY IMAGES; CONFERENCE: SALT. DATA: SEC FILINGS AND BLOOMBERG REPORTING

Alternatives Conference (aka SALT). And after Trump canned him, he went back to SkyBridge and appeared on reality shows and hosted podcasts.

But Scaramucci may be in a corner from which even a cockroach couldn't escape. The reputational hit from his alliance with Bankman-Fried, who denies any criminal wrongdoing, was just the latest problem for SkyBridge after a big bet on crypto that began three years ago. Clients are rebelling, assets are dwindling, and most employees are gone. Although the main fund was up about 10% in the first quarter, investors in it, including Morgan Stanley's wealth management clients and Coca-Cola Co.'s pension fund, are still far from breaking even after losing almost 39% of their money in 2022, mainly on wrong-way crypto wagers. From the start of 2020 through March, clients have seen the value of their investment fall by 30%.

SkyBridge has all but barred investors from redeeming their money, even though two-thirds of its underlying investments could be sold to make payments. In 2020 it cut redemptions to twice a year—March 31 and Sept. 30—from quarterly. For the September 2022 redemption period, investors representing 60% of assets asked for their money back; they got 10%. For the withdrawal period ended this March 31, SkyBridge said it will return 7.5%. In its most recent filing, it stated only that demand exceeded that amount. Morgan Stanley, whose clients account for about $800 million of the $1.1 billion flagship fund, is trying to get them out of it, according to people familiar with the efforts. (A Morgan Stanley spokeswoman declined to comment.)

Michael Rosen, chief investment officer at Angeles Investments in Santa Monica, California, which also manages money for institutions and wealthy clients, says funds should let clients withdraw the money they want to: "Managers have a responsibility to protect investors from losses when markets seize up, but managers also have a responsibility to provide liquidity to investors who request it. If enough people want to leave, you should shut the fund and return the assets as they are sold off." In response, Scaramucci tells *Bloomberg Businessweek*: "We had a very bad year. I've acknowledged that. But what I'm not going to do is something against the interests of my clients. I'm operating inside of the ambit of the prospectus on behalf of my clients. We'll see where things shake out over the next 6 to 12 months."

SkyBridge currently manages $2 billion in total, down from a peak of $9 billion in 2015. The staff that chooses and oversees investments has dwindled to six people, according to its website. In all, more than 40 full-time employees have quit or been fired since 2020, according to a Bloomberg News analysis of LinkedIn.

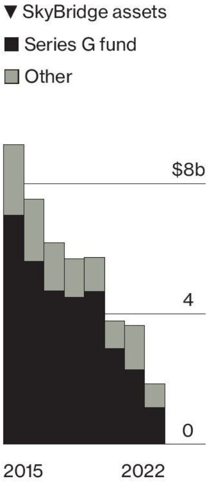
This story of SkyBridge's troubles is based on *Businessweek*'s conversations with more than a dozen former employees and other executives in the hedge fund industry who are familiar with the company and who asked to remain anonymous for fear of retribution. These insiders say the company's downward spiral started when Scaramucci went to the White House—and snowballed beginning in 2018 after Scaramucci, back from Washington, hired a friend from Harvard Law School who's been behind the money-losing push into crypto.

▲ At SALT New York in September 2022

SkyBridge, founded in 2005, is best known for SALT, a Davos for the finance-bro set. SkyBridge's so-called fund of funds business—investing on behalf of clients in managers such as Steve Cohen, Dan Loeb and Israel Englander—got a boost in 2010, when it bought Citigroup Inc.'s hedge fund unit. That added $4.2 billion in assets and a team of more than 20 people. Ray Nolte, who joined SkyBridge from Citi, was in charge of investments; the Mooch focused on schmoozing institutions and wealthy customers. In the next five years, assets doubled, and the firm earned 1.5% of that money. (It later reduced its management fee to 1.2%.)

Coming from a big bank, the Citi crew was used to an institutional atmosphere. Scaramucci ran SkyBridge more like a family-owned business; he even married an assistant, Deidre Ball, in 2014, whom he promoted to vice president for investor relations. She earned $256,250 between January 2016 and June 2017, according to a financial disclosure report Scaramucci made when he joined the Export-Import Bank that June. People working at the company said that by that time, however, his wife had stopped coming to the office and wasn't involved in client meetings. Another person at the ▶

▼ SkyBridge assets



◀ firm said she was there in 2016 before going on maternity leave and then becoming a consultant. (She couldn't be reached for comment.) During the same 18-month period, Scaramucci made $10 million in salary and his share of the company's net income.

Still, he was well liked at SkyBridge—affable and approachable with his working-class, Italian-American, Long Island roots. He liked to play up his tough-guy image. On a cross-country private jet ride with partners, he regaled them with a story about blocking the entrance to a car wash until the proprietor agreed to pay for parking spaces he was using that belonged to the restaurant Scaramucci owned next door. He told colleagues he got the money plus free car washes for his family and friends forever, according to people who heard about the incident.

With SkyBridge's success, Scaramucci started thinking about politics—perhaps even a run for governor of New York, according to people who know him. He looked to sell a majority stake in SkyBridge, including his roughly 45% piece. At the start of 2017, as he was jockeying for a position in the Trump administration, he struck a deal with Chinese conglomerate HNA Group Co. and another small investor that valued the company at about $180 million. But the deal fell through. With Nolte looking to retire, Scaramucci brought on Brett Messing, whom he knew from Harvard and who had worked for Scaramucci at a previous hedge fund he'd founded, Oscar Capital Management. Messing paid about $8 million to become a partner, buying out some of Nolte's and another partner's stakes, said people familiar with the deal. (Messing owns less than 25% of SkyBridge, according to its most recent regulatory filing.)

The new partner, the brother of actress Debra Messing, didn't have the Mooch's charm. Insiders say they were worried because he'd been censured by the US Securities and Exchange Commission in 2010, paying $1.7 million in penalties and surrendered profits without admitting or denying any wrongdoing after the SEC found that he violated short-selling rules multiple times at a hedge fund he ran. At SkyBridge, Messing's first job was to oversee a real estate fund that would take advantage of tax incentives provided by what the government designated as Opportunity Zones. In interviews Scaramucci forecast that it would reach $3 billion. The project soon fizzled. But in 2019, Messing took on a bigger role as a director of the main fund.

At the start of the pandemic, Messing took early-morning Zoom calls from his bed at the Ritz-Carlton Bacara in Santa Barbara, California, with his fiancée by his side and ocean views in the background. That March, SkyBridge's portfolio plunged almost 25% as debt positions—a big concentration in the flagship fund—tumbled. Messing got more involved in investments, even as Nolte was called back from semiretirement, according to people familiar with SkyBridge at the time. Messing pushed to sell some of the company's biggest positions at a steep loss, though some on the investment team protested, rightly predicting they would rebound. A month later, Messing, who by then was president and chief operating officer, took over managing the risk and operational due diligence teams, too.

With the backing of the other investment chiefs, Messing pushed for the fund to get into crypto, buying Bitcoin in November 2020. Insiders say they weren't against the move, but some on the investment team wanted to keep it small because they were buying high: Bitcoin's valuation had jumped almost three times since mid-March. The company kept adding to its crypto holdings until Bitcoin crossed the $50,000 level. As crypto became a larger part of the portfolio, employees complained to management that SkyBridge was exceeding its internal risk guidelines. At one investment meeting, an employee spoke up. Messing responded that the employee was lying about the fund's parameters, according to people who were at the firm at the time. Several months later, the employee found out via an errant email that Scaramucci and Messing wanted him to leave. SkyBridge declined to make Messing available for this story, but Scaramucci says, "He's a little bit of a sharp elbow, but I have an enormous amount of confidence in Brett Messing." He adds, "Since inception, SkyBridge has always, without exception, adhered to all risk guidelines—full stop."

"If enough people want to leave, you should shut the fund and return the assets"

SkyBridge's crypto bets seemed prescient in 2021, and the main fund jumped 11%. The company started expanding its wagers by buying private equity stakes in crypto and blockchain technology companies, including FTX. Then came the crypto winter. In the first half of 2022, the fund dropped more than 25%. That March was the first time SkyBridge declined to meet all of its clients' redemption requests.

On Aug. 2, SkyBridge's main fund bought even more shares of FTX, purchasing them from another investor. Four days later, while on a Disney cruise with his family, Scaramucci took advantage of a stop in the Bahamas to meet with Bankman-Fried. The two made a handshake deal that a unit of FTX would buy a 30% stake in SkyBridge. Scaramucci has said it wasn't because SkyBridge needed money; rather, he saw Bankman-Fried as a Mark Zuckerberg figure who could expand FTX from crypto into bigger things. The partnership allowed Bankman-Fried to tap into Scaramucci's connections. The deal with Bankman-Fried was announced in early September, and SkyBridge issued new shares to sell 30% of itself to FTX for $45 million.

The deal doubled down on the company's crypto bet–and on Scaramucci's friend and mentee, Bankman-Fried. SkyBridge kept $5 million to pay for upfront costs related to SALT, and it spent the rest on tokens, per Scaramucci's agreement with FTX, according to people familiar with the transaction. SkyBridge bought $10 million of Bitcoin and $10 million each of three smaller coins that were tied to FTX and Bankman-Fried: FTT, the so-called native coin of the exchange, Solana and Serum, both of which the crypto tycoon had heavily promoted. All were trading at a fraction of their 2021 peaks.

Scaramucci also set out to schmooze on Bankman-Fried's behalf. Although FTX had already raised $400 million in January 2022, Scaramucci squired his new partner around the Middle East in October in search of other investors who would pony up $1 billion. There were no takers. By November, FTX was bankrupt, and a month later Bankman-Fried was under arrest.

Scaramucci has said he plans to buy back FTX's 30% stake in SkyBridge. And he's on to new projects. Recently he entered a deal to help raise money for Casper Labs, a blockchain company. He's trying to raise $50 million for a fund to buy stakes from distressed sellers in as many as 15 startups. Scaramucci is still a believer, especially with Bitcoin's rebound this year. In a recent podcast, *On the Edge*, he said, "I'm bringing my clients into the future with these investments and these growth areas and this digital technology, and the ones that are smart will stay patient–they are going to be very handsomely rewarded by the process." But his predictions have been off before. In 2018 he forecast that SkyBridge would be managing $20 billion by mid-2023. At the beginning of 2021, he said Bitcoin would be trading at $100,000 by that December.

The Mooch remains philosophical, even if investors are less interested in his musings than they are in getting back their money. In the same podcast, the host, Andrew Gold, asked Scaramucci if he was a psychopath. Scaramucci replied: "I do think I am a psychopath in the sense that I don't really fear too many things. My attitude is we are here visiting the planet.…My attitude is, I'm going to do what I think is right for me, and I'm also not going to care much about what other people think." —*Katherine Burton and Francesca Maglione*

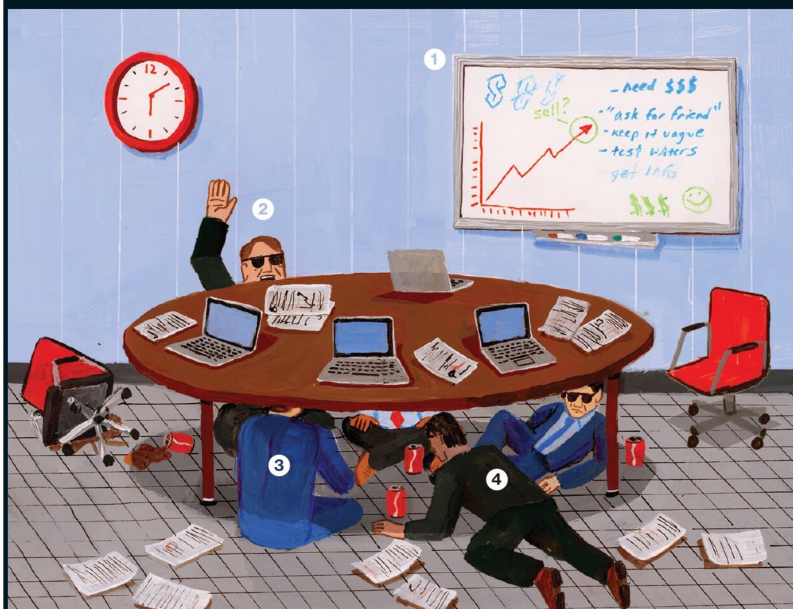
THE BOTTOM LINE SkyBridge clients want their money back after the firm made bad bets on crypto and its founder, Anthony Scaramucci, struck up a partnership with Sam Bankman-Fried.

ILLUSTRATION BY BRANDON CELI

Defined | Wall Crossing

When a public company is thinking of selling new shares, their investment bankers may quietly invite likely buyers to "cross the wall"—initiating them into a small circle of people allowed to have information about a company that's normally limited to insiders. —*Drew Singer*

How It Works



❶ What you learn behind the wall is supposed to stay behind the wall. These secret discussions are legal as long as investors agree not to share the specific information they learn about the company and the possible deal, and to refrain from trading on it for a specified period.

❷ For the banker, bringing in people is delicate. It might start with a pitch about an unnamed company in a certain sector—want to know more? "You have to be very careful about following the script and the rules," says Terry Johnson, a lawyer at Arnold & Porter Kaye Scholer.

❸ Talking with some investors early is a way of gauging demand. Companies and bankers don't want to announce a share sale unless it seems likely to succeed.

❹ Going into stealth mode is becoming more common, because the turbulent market has made share sales tougher even as companies are hungrier for funding. Expect the whispering on Wall Street to grow louder.

GERMANY'S ULTIMATE FIGHTING MACHINES

MARCUS BRANDT/DPA/ALAMY. LEOPARD TANK: ALAMY. PANZERHAUBITZE 2000: AP PHOTO

● Thanks to Putin, business is booming for the country's defense contractors

Edited by Cristina Lindblad

The region between Hamburg and Hanover is known for its landscape of heaths and forests dotted by hamlets of red-brick-and-timber houses. What you don't immediately see is much evidence of its long association with Germany's armed forces, the Bundeswehr, and the defense industry that grew up around it. But you can certainly hear it.

Machine gun bursts, artillery rounds and explosions of varying strength, pitch and duration reverberate—whether they come from Rheinmetall AG's testing site, the tank training grounds to the north or one of the other many firing ranges, it's impossible to say. Barbed-wire fences and woodlands laced with signs warning "*Achtung! Lebensgefahr!*"—"Danger of death!"—keep most of the activity hidden from public view. And that's just how the Bundeswehr and the industry like it.

Germans have a deep suspicion of military force and weapons exports that's rooted in their nation's 20th century history of aggression. But as governments rearm in response to Russia's invasion of Ukraine, Germany's weapons suppliers are experiencing a bonanza, regardless of public sentiment. In one sign of the times, Rheinmetall, which ranks as the country's largest defense contractor, was just added to the main stock market index.

This part of Lower Saxony claims to be the most militarized region in Germany. Some 100 kilometers (60 miles) south of Hamburg, Unterlüss is home to the weapons and ammunition division of Rheinmetall, which operates Europe's largest private firing range on the outskirts of town. Fassberg Air Base is next door. About 13km further to the northwest, Munster hosts the country's biggest army camp.

That's where Ukrainian forces were trained to operate the Leopard 2, the most commercially successful battle tank in the world. With weapons systems made by Rheinmetall on a vehicle by Krauss-Maffei Wegmann, the Leopard 2 is a testament to Germany's engineering chops—the same ones that have elevated the country's cars and domestic appliances to status symbols.

"It's a very, very effective piece of kit," says Jon Hawkes, a specialist in armored fighting vehicles at Janes, a company that supplies intelligence on the defense industry. The Leopard 2 has been in production since 1979, continually upgraded and improved, according to Hawkes. It even has its own users' club. Rheinmetall and Krauss-Maffei Wegmann have an "enormously successful partnership in global terms," he says. "Certainly, in the European land domain, those two are the kings."

Germany ranked sixth in arms exports in 2022, trailing the US, France, Russia, China and Italy, according to the Stockholm International Peace Research Institute. Its biggest sale last year: three state-of-the-art submarines made by Thyssenkrupp Marine Systems and purchased by Israel, at a reported cost of €1 billion ($1.09 billion) apiece.

The German government was initially hesitant to supply Leopard 2s to Ukraine, ostensibly while it waited for the US to step up with equivalent tanks. But Berlin's reticence also showed how the war has pushed the country out of its comfort zone.

With even pacifist Japan increasing outlays for military hardware, global arms makers are experiencing similar surges in demand. Yet Germany's industry stands out because of what amounts to a state-sponsored coming-out party for companies that have preferred to keep a low profile.

At an emergency session of parliament three days after Russia's attack on Ukraine in February 2022, Chancellor Olaf Scholz declared what he called a *Zeitenwende*, or turning point. Gone was a longtime ban on sending weapons into conflict zones so as to aid Kyiv, and in came a special €100 billion fund to upgrade the Bundeswehr's equipment. Germany would finally heed international calls to meet NATO's defense spending target of 2% of economic output.

More than a year later, the government's domestic opposition along with international allies complain that Scholz has little to show for his grand pivot. One big obstacle to a speedier deployment of funds for everything from helmets to howitzers is the country's notoriously sclerotic defense procurement system. Still, the go-slow approach suited a sizable minority of voters, many of them appalled at the prospect of German weaponry again being deployed in the killing fields of World War II.

Those conflicting currents are yet to be resolved. But the defense industry feels vindicated. "Many people now understand that security is not a given—you have to fight for security and democracy," Armin Papperger, Rheinmetall's chief executive officer, said in a March 10 interview at the company's Düsseldorf headquarters. "They also understand that we have to spend money on the armed forces. A country like Germany at the moment is relatively incapable of defending itself, because it doesn't have enough military equipment. That has to change."

Paradoxically, the focus on what's perceived as Berlin's foot-dragging on delivering heavy equipment to aid Kyiv has served to highlight that equipment's quality and performance on the battlefield. Diehl Defence's IRIS-T air defense system, equipped with infrared homing missiles that travel at three times the speed of sound, has garnered praise from Ukraine's air force for a 100% success rate in hitting its targets.

Ukrainian troops also have complimented the Gepard antiaircraft tank on social media for its ability to shoot down Iranian Shahed drones. The Panzerhaubitze 2000 has acquired a reputation for being one of the most powerful and rapid self-propelled howitzers around. Both are made by Krauss-Maffei Wegmann. "German defense contractors produce some of the most capable armored vehicles anywhere, and I am happy to see more of them going to help Ukrainians," says Scott Boston, a senior defense analyst at Rand Corp.

As part of the Zeitenwende, Scholz has made a point of visiting military installations and contractors over the past year. Germany's ability to defend itself requires "a strong Bundeswehr and a capable arms industry," he said during a January visit to high-performance radar specialist Hensoldt AG. In February, as Hensoldt reported a record €5.4 billion order backlog, it said Russia's aggression has brought the need for an efficient defense industry and military "back into the political and social spotlight."

For some contractors, that's not a comfortable place to be. Neither Krauss-Maffei Wegmann nor Diehl is publicly traded, so there's little chance you'll catch their executives speaking enthusiastically about the new business climate. Both declined to comment for this article.

As a publicly traded company, Rheinmetall is less tight-lipped. And there's been lots to boast about lately. Where it once touted its environmental credentials—the wolves that have returned to rove its testing ground near Unterlüss, the beehives deployed at a site in Kassel, where the company develops tactical wheeled vehicles (the first Rheinmetall honey is due this spring)—it now announces weapons and munitions orders almost every week.

Shares in Rheinmetall have almost tripled since Vladimir Putin's tanks rolled into Ukraine, pushing its market value above €10 billion. On March 16 it reported record earnings, record new orders and a record backlog of €26.6 billion.

In Unterlüss there's little sign of the boom at ▶

● LEOPARD 2 TANK

Maker: Krauss-Maffei Wegmann, Rheinmetall AG

Approximate cost: €13 million to €17 million

The Leopard 2 has been in continuous production since the 1970s. There are more than 100 versions now in use in Canada, Indonesia, Qatar, Turkey and across Europe. It's one of just three main battle tanks equipped with the most advanced protection systems to increase a crew's survivability, according to Jon Hawkes of Janes. However, the Leopard 2, unlike its peers, had never been deployed in a high-intensity conflict until shipments from Germany and a few other nations began arriving in Ukraine in late March.

● PANZERHAUBITZE (PZH) 2000 HOWITZER

Krauss-Maffei Wegmann, Rheinmetall

€17 million

Touted by Rheinmetall as "the most powerful and modern artillery system in the world," the PzH can achieve a range of 35 miles using rocket-assisted shells. Scott Boston of Rand Corp. calls it a "world-class howitzer" in range and rate of fire. Despite reports of frequent breakdowns in Ukraine—an issue that has plagued all self-propelled howitzers—Kiev has been impressed enough by the PzH 2000 to place an order last year for 100 more, at a cost of €1.7 billion.

◀ Keep-out signs around Rheinmetall's testing site near Unterlüss

◀ first glance. Arrayed along the town's modest main street are a budget-chain supermarket, a gas station, a Turkish kebab shop and a railway station. But on a recent weekday, hundreds of cars parked outside Rheinmetall's complex and along the road indicated the buzz of activity inside. An enterprising local gym stays open into the night to cater to workers on rotating shifts.

The company is adding a munitions assembly line, at a cost of more than €10 million. On the mid-February day when this reporter visited Unterlüss, it announced an order of some "three-digit million euros" placed by Germany on behalf of Ukraine for 300,000 rounds of 35mm ammunition for the Gepard.

Rheinmetall declined access to its site, on security grounds. It did welcome German Defense Minister Boris Pistorius later that month, though. "We're running at full steam here," CEO Papperger said during the visit.

This corner of Germany isn't coy about its relationship with the military and all that's entailed over 90 years. The nearby air base in Fassberg dates from 1934, the year after Adolf Hitler became chancellor. Around the same time, a training ground with tank firing ranges sprouted just to the south in Bergen. At the outset of World War II, a prisoner of war camp was built on its eastern fringe. The complex, Bergen-Belsen, was later turned into a concentration camp. Over the course of the war, roughly 52,000 captives died from a combination of starvation, disease and exposure.

In all, the region was home to around 20 prison camps, including one at Unterlüss that housed women forced to work at Rheinmetall-Borsig AG, as it was then known. The company paid for a memorial to be built in the town. It officially opened to the public on Feb. 21 of last year, three days before Russian tanks rolled into Ukraine.

Two kilometers away, on the grounds of a Lutheran church, a metal cage covers concrete steps leading down to a wartime bomb shelter where children from a nearby school gathered during Allied raids. A commemorative plaque outside reads: "Europe, have you not learned?"

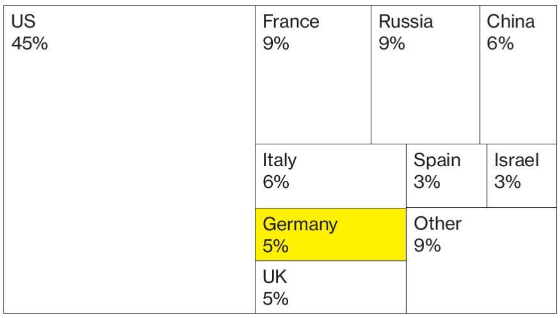
▲ A Rheinmetall production plant in Unterlüss

◀ The Chamberlains at home

PHOTOGRAPHS BY JAKOB SCHNETZ FOR BLOOMBERG BUSINESSWEEK. IRIS-T: DIEHL DEFENSE. TRML-4D RADAR: AP PHOTO

Hidden Champions

German contractors' share of global arms exports in 2022



DATA: STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

Following Germany's defeat in World War II, the country was demilitarized. But with the emergence of the Soviet threat, realpolitik prevailed and the occupying powers blessed the creation of the Bundeswehr in 1955. The West German army was a bulwark of NATO's forward defense at the Iron Curtain. At its peak, from the 1970s until just after reunification with East Germany in 1990, it numbered some 500,000 military personnel and 7,000 battle tanks.

As the Cold War threat evaporated, Germany's combined armed forces were culled, compulsory military service was scrapped, and defense spending was slashed. The post of defense minister, once occupied by such political heavyweights as Franz Josef Strauss and Helmut Schmidt, became a backwater.

The Scholz administration's goal of tapping the country's industrial prowess to upgrade the Bundeswehr risks running headlong into public attitudes that can seem at odds with Europe's present reality. Polls consistently show that only a narrow majority of Germans favor arming Ukraine. A "manifesto for peace" calling for an immediate end to weapons shipments and the imposition of a cease-fire has attracted more than 750,000 signatories, among them politicians, religious leaders, artists and lawyers. Scholz addressed the issue in a speech to the Bundestag on March 2: "Peace cannot be achieved by shouting 'No more war' in Berlin and at the same time demanding a halt to all weapons supplies to Ukraine," he said.

Unspoken was the reality that, unlike in the US or the UK, the Russian invasion and its consequences are never far away in Germany. Ukraine is a 10-hour drive from Berlin; Germany hosts a million Ukrainian refugees; and the country is enduring a painful process of weaning itself off cheap Russian gas that puts the viability of swaths of German industry in doubt.

For David McAllister, the former prime minister of Lower Saxony state who now chairs the European Parliament's foreign affairs committee, Putin's aggression has compelled Europe to begin a new chapter in its history. How Germany balances the need to more actively provide for its own security with the population's ingrained pacifism, instead of leaning on the US, still has to be worked out.

"We haven't all 100% realized what epochal change we're going through," says McAllister, whose father was Scottish and who himself served in the Bundeswehr. "A lot of things which were guaranteed even in the coldest days and weeks of the Cold War obviously are now actively put into question by the Russian invasion."

As a gun fitter with the British army in Germany during the Cold War, Malcolm Chamberlain was told he had 24 hours to live in the event of an attack by Warsaw Pact forces across the Elbe River. The assumption was that Soviet tank battalions, having crossed the first major barrier to the West, would roll over all before them.

Having served for seven years, including three tours of duty in Northern Ireland, Chamberlain makes for an unlikely pacifist. After being stationed in Münster in 1974, he left the army to avoid being posted away after he married his German wife, Karin, and they had a son. He's lived and worked in the region ever since, including a brief spell at Rheinmetall.

"It's a terrible situation. I don't know anyone who doesn't sympathize with the Ukrainians, but where's it going to end?" Chamberlain, a 70-year-old dual German-British citizen, asks over coffee at his house near Unterlüss, down the road from artillery firing range No. 21. "Everyone says it can only be a diplomatic solution, so how many deaths do we want?"

A loud percussion shatters the late afternoon calm with the force of thunder. The Chamberlains rarely notice the blasts now, but they were planning to attend a demonstration in Unterlüss on Easter Saturday calling for the guns to fall silent, an end to war and no more weapons exports.

Germany's military contractors may be quietly toasting their fat order books, but they know that Scholz's Zeitenwende is fragile. "I think that our image has changed for the better," Rheinmetall's Papperger said in December. "But I don't know if it's going to last." —*Alan Crawford, with Alexander Michael Pearson, William Wilkes and Marc Champion*

THE BOTTOM LINE Russia's invasion of Ukraine has been a boon for Germany's weapons makers, a group of companies that have traditionally kept a low profile.

● IRIS-T MISSILE DEFENSE SYSTEM

Diehl Defence

€150 million

The IRIS-T was developed as an air-to-air guided missile of the type that is now standard on combat aircraft such as the F-16 and Eurofighter. The IRIS-T is also at the core of a surface-to-air battery intended to protect against aircraft, helicopters, drones and missiles. One system was supplied to Ukraine by the German government and had a 100% success rate in knocking out its targets, winning praise from President Volodymyr Zelenskiy. Bloomberg News reported in February that Berlin was negotiating a contract as large as $3 billion with Diehl to procure up to eight IRIS-T systems for the German-led European Sky Shield Initiative.

● TRML-4D RADAR

Hensoldt AG

Cost not available

Four of these high-performance radars made by Bavarian sensor specialist Hensoldt guide the IRIS-T system. They're already being used in Ukraine with "excellent operational results," and two more are scheduled to be dispatched in April as part of an order worth "two-digit million" euros, according to Chief Executive Officer Thomas Müller. Employing advanced Active Electronically Scanned Array technology, the system is capable of tracking 1,500 targets in a radius of up to 155 miles. Hensoldt's high-end products are widely used in optics systems across a whole range of military vehicles, says Hawkes at Janes. "It's hard to rival companies like that globally," he says.

Your Wealth in a Wild World

ILLUSTRATION BY ANNA HAIFISCH

● Answers to perplexing new questions in a time of economic weirdness

There's no doubt about it: The shift from the pandemic economy to whatever comes next has been frustrating and confusing. Inflation's back in the US for the first time in a generation. The federal government has had to step in to guarantee depositors at a pair of banks. Markets are up this year, but your retirement account is likely still recovering from the shellacking it took in 2022—not just on stocks, but on bonds, too. Mortgage rates have shot up to ... wait, how much?! Maybe you've thought about quitting your job for a better one—unemployment is still near historic lows—but then you heard about all these layoffs. You'd like a new car, but prices are still nuts. In a time when everything seems more up in the air than usual, we asked financial experts to help us untangle the knottiest money problems, from investing to career planning to smarter spending.

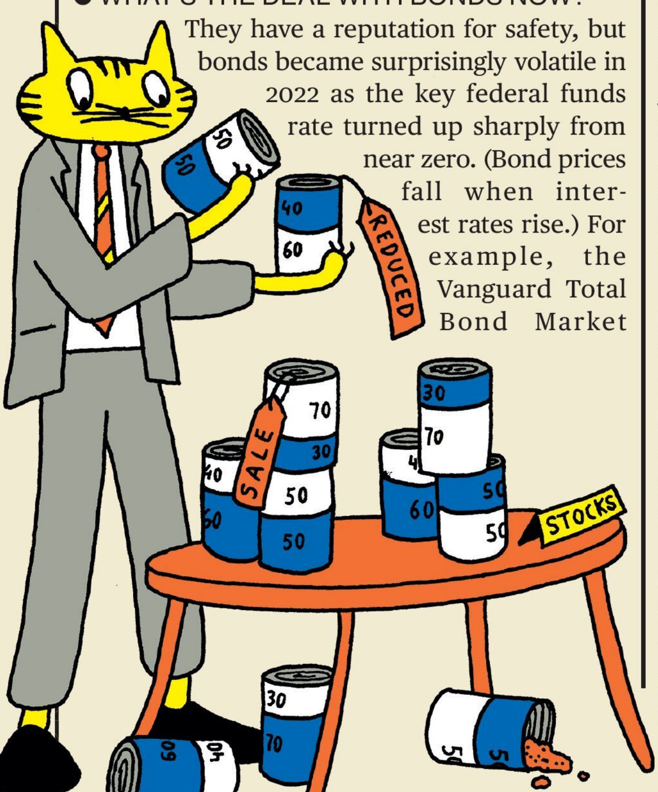
● SO I SHOULD BE PUTTING MY CASH UNDER A MATTRESS RIGHT NOW, RIGHT?
The sudden failures of Silicon Valley Bank and Signature Bank in March were scary, but for the vast majority of US bank depositors, there's no need ▶

Edited by Pat Regnier and Bret Begun

◀ to worry about your dough. The Federal Deposit Insurance Corp. covers $250,000 per depositor in qualified accounts at insured banks. If you somehow find yourself with more than that, diversifying among multiple banks might be a good idea, says Peter Palion, founder of Master Plan Advisory. You can also be strategic about who's listed as the depositor on your accounts because the FDIC covers each co-owner of a joint account. (Fun deposit insurance fact: Married couples can get $1 million of FDIC coverage at one institution just by having a personal bank account in one spouse's name, a personal bank account in the other spouse's name and a joint account.)

But most traditional bank accounts offer little to nothing in interest. If you want to do better, you can get about 3.75% in FDIC-insured high-yield savings accounts from online banks such as Ally Bank and Goldman Sachs Group Inc.'s Marcus. Insured certificates of deposit are paying around 4.5% if you're willing to lock up your cash for 12 months. Series I savings bonds from the US government (available at treasurydirect.gov) adjust their yield with inflation and currently have a 6.89% interest rate. Finally, many money-market mutual funds are also paying more than 4% now—but remember that while these funds invest in short-term instruments and should be low risk, they're not FDIC-insured.

● WHAT'S THE DEAL WITH BONDS NOW?



They have a reputation for safety, but bonds became surprisingly volatile in 2022 as the key federal funds rate turned up sharply from near zero. (Bond prices fall when interest rates rise.) For example, the Vanguard Total Bond Market Index Fund—a fairly plain-vanilla way to invest in bonds—lost about 13% last year. At the same time, the S&P 500 stock index lost about 18%—meaning that a classic diversified portfolio of 60% stocks and 40% bonds would have lost about 16%. So it didn't feel like bonds offered much protection. But giving up on asset-class diversification now would be a mistake, experts say. Because they offer a steady stream of income and repayment at maturity, bonds generally provide a smoother ride than stocks in turbulent markets. And because the Federal Reserve has hiked rates quickly, money managers including BlackRock, AQR Capital Management and DoubleLine are expecting increases to level off and bonds to rebound. (The Vanguard bond index fund has returned 3% this year.) If you're still anxious about volatility, consider moving some assets—particularly money that you might need within a couple of years—into bonds or bond funds with shorter maturities, which are generally less risky.

● ARE STOCKS CHEAP?

Despite a bit of a rally this year, the S&P 500 has lost almost 13% since the start of 2022. But the mere fact that stocks have fallen doesn't necessarily mean they're a bargain yet. During a decade of low interest rates, investors frustrated with paltry yields on bonds piled into stocks looking for better returns. Equity valuations surged, and they're still high by many measures. For example, Bloomberg Opinion columnist John Authers recently pointed to share prices as a multiple of companies' sales. With a price to sales ratio of more than 2, the S&P 500 is still as expensive as it was at the peak of the dot-com bubble in 2000. Other measures tell a similar story. Max Gokhman, head of MosaiQ Investment Strategy at Franklin Templeton Investment Solutions, likes to look instead at prices relative to "book" value, or the value of a company's assets. "It's much harder to gussy up book value with creative accounting," he says. Right now stocks on the S&P 500 trade at about four times book value, down from five at the end of 2021, but above where the metric was for most of the past 20 years.

This doesn't mean stocks won't make money from here, just that the return you should expect is probably lower than the gains investors got used to in the bullish decade leading up to 2022. The good news—particularly for younger savers—is that you don't have to nail the timing, which is difficult to do anyway. If you're investing a set portion of your paycheck every month, you have some

● Chance of a recession in the next 12 months, according to Goldman Sachs

35%

math on your side helping you to take advantage of falling prices: You automatically end up buying more shares when prices are low, and fewer when they are high. "In volatile markets, this really helps you," says Burton Malkiel, emeritus professor of economics at Princeton University.

● WHAT'S ALL THIS I HEAR ABOUT A RECESSION?

The chatter has certainly gotten louder since those banks got into trouble. Although their collapse hasn't set off a broader financial contagion, the strain they fell under was a sign that the Fed's tighter policy is starting to bite in the real economy. Goldman Sachs recently increased its estimate of the odds of a US recession in the next 12 months to 35%, up from 25%. Meanwhile, the median estimate of economists surveyed by Bloomberg News is 65%. Right now the economy is stable: US employers added more than 300,000 jobs in February, and the unemployment rate is only 3.6%. But analysts such as Matt Maley, chief market strategist at Miller Tabak + Co., worry the banking crisis could cause banks to tighten their standards, leading to less credit availability and slower economic growth.

● HOW BIG AN EMERGENCY FUND SHOULD I HAVE IN CASE I LOSE MY JOB?

The standard rule of thumb among financial planners is three-to-six months' worth of living expenses in cash or a cash-like instrument such as a high-yield savings account or a certificate of deposit. Some financial advisers are now recommending stashing away even more, given the heightened risk of a recession that could prolong job searches. OK, look, this is a stretch goal for most people—planners tend to work with affluent (and older) clients, while surveys show large numbers of Americans would struggle to meet a surprise $1,000 expense from savings. But every bit you can add takes pressure off and you don't need to get there right away. Younger people might not need to have as much in savings, because they typically have more flexibility and lower target salaries when looking for a new job.

● IS COLLEGE STILL WORTH THE COST? AND HOW DO I SAVE FOR IT?

In 1970 it cost about $10,000 a year, adjusted for inflation, to attend a public four-year school (including tuition and room and board) and about $20,000 a year for a four-year private school. For the 2022-23 academic year, those figures are $20,500 and $52,590, respectively. So it makes sense that many young people are eyeing college more carefully than previous generations. Bear in mind that the true price of college after grants—particularly for low-income students admitted to selective schools—may be far lower than the sticker price. (When considering aid, pay attention to how much comes from grants, which don't have to be repaid, versus loans.) The wage premium for college graduates is still high: The median recent graduate with a bachelor's degree earns about $18,000 more a year than a peer with only a high school diploma, according to an analysis by the New York Fed.

Crucially, though, students have to finish that degree, and even then the Fed researchers found that about 25% don't make more than the typical high school grad. If there's uncertainty about going, local public or community colleges can be good options to earn credits without piling on huge debt.

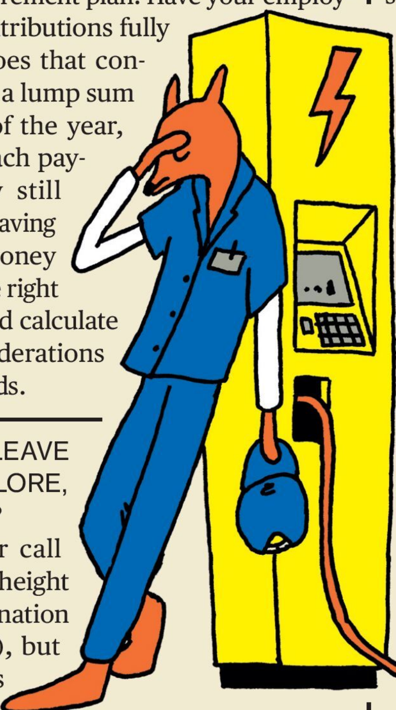
For parents trying to plan for their kids' college education, Nicole Birkett-Brunkhorst, a wealth planner at US Bank Private Wealth Management, recommends making the price of four years of in-state college your goal so that you don't disregard your own retirement planning. When the time comes, you may find that your child has financial aid and loan options if they want to go to a private school. Some parents may worry about a child's choice of college major and the earnings implications, but Birkett-Brunkhorst advises taking the long view: "They are still learning skills they can take to their employer, like problem solving skills that will make them successful."

● I'M THINKING OF QUITTING MY JOB FOR A NEW ONE. WHAT SHOULD I CONSIDER (BESIDES, UH, THE PAY)?

The security of the new job probably matters more than it did a year ago when all economic indicators were pointing upward. How stable is the industry? Tech companies this year have been laying off workers—with Meta Platforms Inc. and ▶

ILLUSTRATIONS BY ANNA HAIFISCH

◀ Amazon.com Inc. announcing thousands of job cuts in March—while transportation and manufacturing businesses are adding jobs. Gauging your prospective employer's attitude—and your own—toward remote work can help avoid frustration and dissatisfaction down the road, especially as more bosses are forcing a return to in-office work. When timing your departure, don't forget about the implications for your 401(k) retirement plan. Have your employer's matching contributions fully vested yet? Or does that contribution come in a lump sum toward the end of the year, instead of with each paycheck? You may still decide it's worth leaving some matching money on the table for the right job, but you should calculate it into your considerations and salary demands.



● CAN'T I JUST LEAVE MY JOB TO EXPLORE, LIKE, LIFE, MAN?

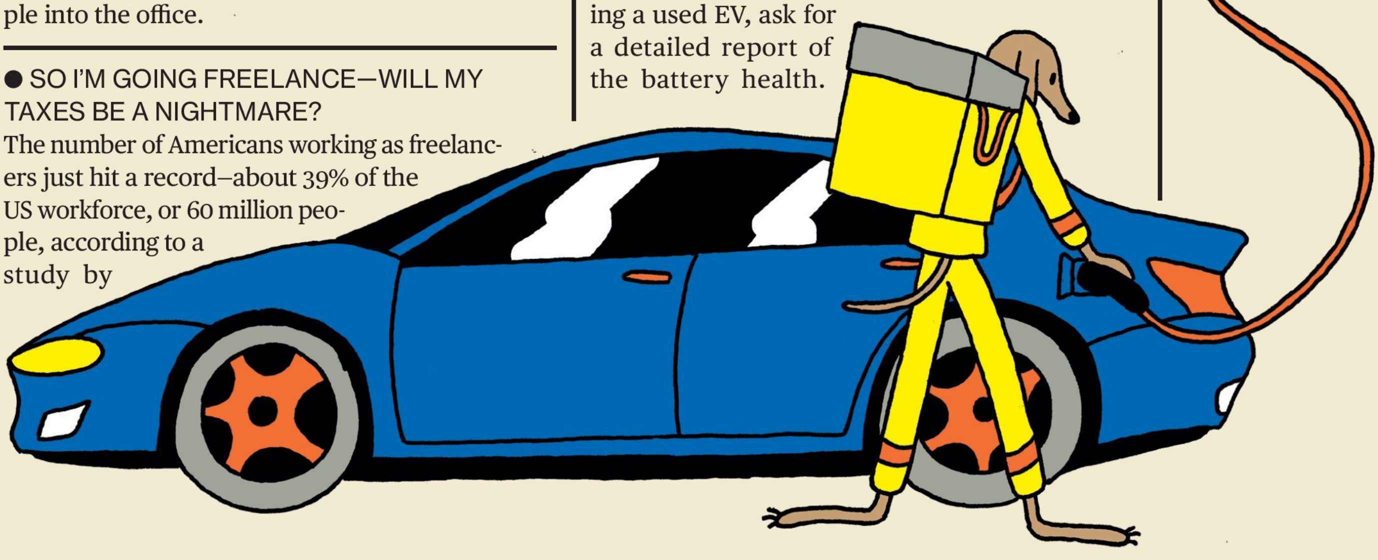
This is a tougher call than it was at the height of the Great Resignation (remember that?), but if you have savings and a plan, you can still do it. Think about how long you'll likely be without steady income, and go from there. Ask yourself: Are there ways for me to make money in a pinch if I need to? Could I freelance? Another thing to consider is your location. If you took advantage of work-from-home flexibility to move away from a big city, what are your new local job opportunities like? It might be more difficult to land a remote job now that companies are trying to bring more people into the office.

● SO I'M GOING FREELANCE—WILL MY TAXES BE A NIGHTMARE?

The number of Americans working as freelancers just hit a record—about 39% of the US workforce, or 60 million people, according to a study by freelancing platform Upwork Inc. That compares with 36% in 2021, meaning millions are filing taxes for the first time as freelancers. There are a few ways to reduce the total sum owed to the Internal Revenue Service. Shane Sideris, co-founder of Synchronous Wealth Advisors LLC in Manhattan Beach, California, recommends contributing to retirement plans suited for self-employed people such as a SEP IRA or a Solo 401(k) to reduce total taxable income (and prepare for the future). Also make sure to set up separate checking accounts for personal and work expenses, so you can more easily deduct business-related costs when filing taxes. Those who use digital payment platforms such as Venmo and PayPal to conduct business will soon have to report transactions of more than $600, but the IRS just delayed that for another year. Still, estimate how that will affect your tax situation next year and plan accordingly.

● CAN I BUY A TESLA NOW?

The pandemic sent car prices through the roof. Price wars among electric vehicle makers, however, are driving down the cost of a new eco-friendly car. Tesla Inc. slashed prices in January, making its Model Y 20% cheaper—a $13,000 cut. Ford Motor Co. followed suit by dropping the price of its electric Mustang Mach-E by $4,500. Along with the $7,500 tax credit offered by the IRS for buying a new clean vehicle, purchasing an EV is becoming more affordable. But don't let those headline numbers draw you in too quickly, says Craig Toberman, founder of Toberman Wealth LLC. The cost of car loans is rising, with the average interest rate at 8.02% in December, compared with just 5.15% a year earlier. If you want to save money by buying a used EV, ask for a detailed report of the battery health.



Even if you'd still buy the car, you can use it as a potential bargaining chip to reduce the price. Also, check how much of the battery warranty is left: Most battery coverage lasts for eight years or 100,000 miles from purchase.

● IS IT CRAZY TO BUY REAL ESTATE FOR THE FIRST TIME NOW?

Home prices across the country are starting to cool after the tremendous pandemic surge. But for those who've spent years saving for a down payment and finally have the cash, it's hard to take the plunge with borrowing costs so high. The average rate for a 30-year, fixed loan is now 6.45%, up from 4.72% at this time last year. That means the monthly payment on a $500,000 home with 15% down would be about $3,100 now, up from $2,600, according to Bankrate. The key factor is your long-term plan, says Sideris. "Even if you purchased a home at the 2007 peak, right before the financial crisis, as long as you had the ability to comfortably afford the payments, your home value is way higher today than it was back then," he says.

● SHOULD I MOVE TO TEXAS? MAYBE FLORIDA?

High prices for homes in big Northeastern and California cities have people looking for new locales with nice weather and no state income taxes. But double-check how advantageous a move would be. With legions of city dwellers thinking the same thing at once, prices in once-cheap smaller cities have skyrocketed. For instance, it now takes house hunters in Austin almost as long to save up for a down payment as those in New York City.

● CAN I AFFORD TO HAVE A KID? IN THIS ECONOMY?

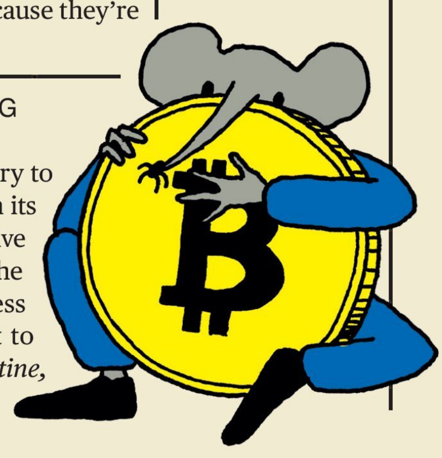
Having children is a matter of your heart as much as your head. But if you want the numbers (and maybe you don't), the average cost to raise a child to 17 is now $310,605, up more than $26,000 from a previous estimate made in 2017 thanks to higher-than-expected inflation, according to the Brookings Institution.

● IS THAT EXPENSIVE NEW AMEX CARD WORTH IT?

American Express Co. has revamped its Platinum Card with more sign-up points and nontravel benefits. But it also comes with a $695 annual fee, up from $500. The sign-up bonus—easily worth more than $1,000 in points—is compelling, but paying that fee year after year may be a money-losing strategy for those who aren't diligent about squeezing out the most rewards. Frequent travelers are probably the only group that should pay for the card long term, says Erik Baskin, founder of Baskin Financial Planning in Sugarcreek Township, Ohio.

● WAIT, I JUST REALIZED: I COULD OWE CAPITAL GAINS?

Some mutual fund investors are getting a rude surprise this tax season: Even though their mutual funds lost money, they could have tax bills on their holdings. That's because fund managers buy and sell securities inside the portfolio, and many did in the past year to reposition as stocks across industries dropped or to meet redemptions. If those securities increased in price since they were purchased, the tax on those capital gains will be passed along to shareholders. For the current tax season, there isn't much you can do but pay Uncle Sam. In future years, putting fresh cash in your taxable accounts into exchange-traded funds, instead of mutual funds, can reduce bills because they're run in a more tax-efficient way.



● WHEN SHOULD I STOP HODLING MY CRYPTO?

Maybe in 2021? Seriously: We won't try to predict the price of Bitcoin. But even its upswings show it's a volatile, speculative bet. And the many crypto frauds of the past year show that even if you guess prices right, you still might not get to keep your winnings. —*Claire Ballentine, with Suzanne Woolley*

● Annual fee on American Express Platinum Card

$695

ILLUSTRATIONS BY ANNA HAIFISCH

Life-changing data

Cognoa helps diagnose autism in children up to 3 years earlier on Lakehouse

databricks.com/cognoa

ILLUSTRATION BY ARIEL DAVIS

Wrangling Over Green Subsidies

The US and EU seek to agree on sustainability incentives to avert a trade war

As European Commission President Ursula von der Leyen sat in the White House's Oval Office last month, she gushed before the cameras about the US's Inflation Reduction Act of 2022 (IRA). "It's great that there's such a massive investment in wind and clean technologies now," she said of America's green awakening.

It wasn't until the press shuffled out that von der Leyen shifted to a much sterner message, according to people familiar with the meeting, who asked not to be identified discussing private matters. Europe's executive chief warned President Joe Biden that the law's bias against European companies was unacceptable and that anything short of a pragmatic fix would become a major irritant in the trans-Atlantic relationship.

The US and the European Union are negotiating a limited critical minerals deal that may put a salve on those simmering tensions, but Washington's protectionist agenda is still causing anxiety in Brussels, where the US needs help pressuring China. Meanwhile, the Biden administration remains frustrated with what it views as the EU's rigid adherence to a rules-based trading system that's no longer fit for purpose.

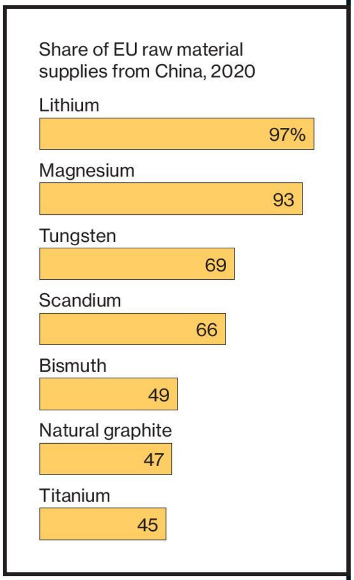
"Europe was genuinely surprised that the Biden administration didn't revert back to the pre-Trump days," says Kelly Ann Shaw, a partner at law firm Hogan Lovells who served on the Trump administration's trade and economic team. "They missed the memo that the politics on trade have changed."

If the US and EU can bridge their gaps on trade, they may preserve an important economic bulwark against China's rise and Russia's expansionism. But if talks founder, a new ▶

Edited by
Rebecca Penty

◀ trans-Atlantic trade war could undercut a mainstay of the world economic order and create lasting headwinds for global growth.

Since entering office, Biden has attempted to repair a trans-Atlantic relationship that frayed during his predecessor's costly trade wars. Biden and von der Leyen forged an important ceasefire in 2021 over a long-running dispute regarding illegal subsidies given to Airbus SE and Boeing Co., and both sides shelved duties on about $11.5 billion of each other's exports.



The truce established a baseline level of trust between US Trade Representative Katherine Tai and her European counterpart, EU Trade Commissioner Valdis Dombrovskis. It also provided a crucial foundation to confront back-to-back shocks that highlighted a dangerous overreliance on authoritarian nations—China's draconian Covid-19 controls that temporarily shut off much of its economy from the world, followed by Russia's invasion of Ukraine.

Early on, there was common purpose: The EU and the US cooperated to impose stiff economic penalties aimed at crippling President Vladimir Putin's war machine and developed a new energy alliance that turned Europe into the top buyer of US liquefied natural gas.

While leaders on both sides of the Atlantic welcomed this era of bonhomie after years of tariff skirmishes, their unified front against Russia masked some profound differences over each other's approaches to trade.

Beyond the more pleasant tone, the Biden administration remains fixated on China and shows far less interest in discussing ways to enhance trans-Atlantic trade cooperation, according to an EU official who declined to be identified because of the private nature of the discussions. The IRA aims to challenge China's dominance in green technologies and revolutionize America's clean energy marketplace by providing $369 billion in tax credits and other incentives—though the final figure could end up being far greater.

The European Commission responded to the US subsidy program with its own Net Zero Industry Act, which eases access to EU state aid for clean technology investments by loosening a host of EU regulations governing investment, permitting and public procurement, among other areas.

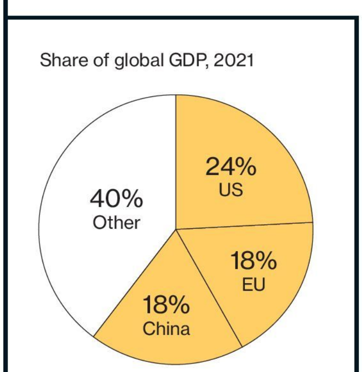
The US law irked many in Brussels, where EU officials worried the massive American subsidies would unfairly distort the market for green goods, lead to an exodus of European clean energy investment and encourage a global subsidy race. Europe was also concerned that the IRA's critical minerals rules would create an unhealthy competition between the US and EU for scarce goods located outside of China, which would paradoxically force European companies to become more reliant on Chinese inputs than ever before.

The EU briefly considered filing a World Trade Organization dispute over the US law's discriminatory provisions but ultimately decided that a public display of disunity would undermine the broader cause of cooperation against Russia.

"The overall reason that the EU and US are trying to have a civilized disagreement is the war in Ukraine," says former EU Trade Commissioner Cecilia Malmstrom. "Any obvious cleavage or big disagreement will be used by Putin, and that is not a good idea."

The proposed critical minerals deal aims to alleviate these concerns by setting new trans-Atlantic terms aimed at reducing dependence on China for raw materials. In return, the US will provide EU companies with greater access to some of the IRA's subsidies and tax credits.

Ultimately, the US wants to create a club of like-minded countries that agree to reduce their dependence on China for raw materials such as lithium, cobalt, nickel and magnesium, which are key ingredients for electric motors and batteries. The US and Japan signed a similar agreement in March. Reducing Europe's overreliance on China for key raw materials is a clear priority for Brussels because the EU currently sources some 98% of its rare earth supplies from China.



The critical minerals deal may be a positive step, but the US Treasury Department's green subsidy guidelines won't address all of the EU's concerns. There also remains a lingering fear in Europe that if Donald Trump is reelected he'll pivot back to a more combative approach. That's a point of tension that China is keen to exploit as it works to drive a deeper wedge between the US and Europe.

Over the past decade and particularly during the Trump administration, China made significant inroads into the European marketplace and strengthened its relationships with France, Germany and the Netherlands. Last year, Chinese President Xi Jinping hosted German

PLANE: COURTESY AIRBUS. DATA: EUROPEAN COMMISSION, WORLD BANK

Chancellor Olaf Scholz and a powerhouse delegation of German executives from BASF, BioNTech and Deutsche Bank to underscore Beijing's close ties with Europe's largest economy.

Xi knows that China's $6.8 trillion consumer marketplace is an essential destination for European exports of cars, pharmaceuticals and machinery. German automakers BMW, Mercedes-Benz and Volkswagen have built dozens of factories in China, and all three manufacturers now sell more vehicles in China than in any other market.

Europe has no plans to completely cut off trade relations with China, but it recognizes the need to minimize its dependence and strike a more assertive tone. The US also hopes to garner EU support for new trade tools to penalize Beijing's nonmarket economy practices—like its massive state subsidies for the steel and aluminum sector. That's why the US and the EU are negotiating a potential agreement to "drive decarbonization while also limiting anticompetitive and nonmarket practices" from countries such as China, US Trade Representative Tai told US lawmakers in March.

In December, she proposed the creation of a group of nations that would agree to raise tariffs on imports of foreign steel and aluminum produced by carbon-intensive practices—a move that's ostensibly aimed at China.

The US and EU hope to conclude the Global Arrangement on Sustainable Steel and Aluminum before the expiration of a bilateral tariff truce in October. Otherwise, it could trigger a trade war relapse and automatically restore Trump-era tariffs on more than $10 billion of trans-Atlantic exports—such as Harley Davidson motorcycles and French wine—as soon as Jan. 1.

But EU officials say the deal, as proposed, will violate WTO rules and preserve the US's ability to impose tariffs at a later date, leaving Europe at the whim of future administrations.

The stakes are massive for getting this right. The US-EU trade relationship is arguably the world's most influential democratic alliance. Bilateral trade between the US and Europe accounts for 42% of global gross domestic product and directly employs almost 10 million workers at foreign affiliates on both sides of the Atlantic.

If the US and the EU can get on the same page, it could persuade other Group of Seven allies to embrace a new economic order that forces China to play by their rules. "A US that's allied with Europe seeing eye to eye on China is a much more serious proposition for China," says Wendy Cutler, a vice president at the Washington-based Asia Society. —*Bryce Baschuk, Alberto Nardelli and Eric Martin*

THE BOTTOM LINE Resolving US-EU trade conflict is critical for preserving the world's most influential democratic alliance, an important bulwark against China's rise and Russia's expansionism.

Green Aviation Inches Toward Takeoff

The EU's decarbonization targets are spurring efforts to commercialize sustainable solutions

Getting an 80-ton Airbus A320 off the ground requires huge amounts of energy, with a fully fueled aircraft capable of flying 4,800 kilometers (3,000 miles) loading up on more than 20,000 liters (5,283 gallons) of kerosene, almost 10 times the average annual gasoline consumption of a car. Long-distance journeys are even more polluting: A flight from Frankfurt to New York on a Boeing 747 jumbo jet emits around the same amount of carbon dioxide as heating 440 German homes for a year (roughly 2,000 kilograms, or 4,400 pounds, per passenger).

It's no wonder then that aviation has become a prime target of climate activists and lawmakers, who are calling for people to fly less or take the train on shorter routes. Some countries are already taking action by outlawing short flights where the train offers a reasonable alternative. Last year, more radical opponents broke through perimeter fences and literally glued themselves to the tarmacs at Berlin and Munich airports. Greenpeace wants to see private jets banned in Europe, branding them as "staggeringly polluting and generally pointless."

Airlines and aircraft manufacturers are recognizing that they must decarbonize if they want to stave off protests and legislative restrictions on growth. And ▶

◀ Europe—home to Airbus, engine makers such as Safran and Rolls-Royce Holdings as well as a host of aviation startups—is emerging as the most ambitious test bed for new technologies, spurred by European Union leaders who want to make the bloc's economy climate neutral by 2050, ahead of other regions.

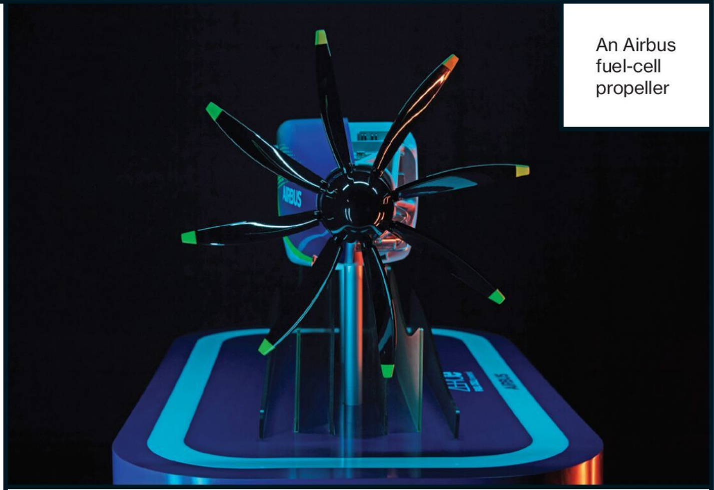
Airbus and some of Europe's biggest airline groups, including British Airways parent IAG, Deutsche Lufthansa, Air France-KLM and Ryanair Holdings, have committed to net-zero emissions by the 2050 goal. But decarbonizing aviation is fraught with technical and economic hurdles.

Airbus SE, the world's biggest aircraft maker, is betting that planes powered by hydrogen, which produces no CO_2, could be a solution for zero-emissions flying and says it will have a hydrogen-powered model in service by the middle of the next decade. The company is converting the first A380 superjumbo that it ever built into a demonstrator aircraft, which is scheduled to perform flight tests of a hydrogen combustion engine mounted on its fuselage starting in 2026. "I love what aviation does, physically connecting people," says Glenn Llewellyn, vice president of Zeroe Aircraft, Airbus's zero-emissions program. "At the same time, I want to eliminate its climate impact. That's mandatory if we want to be able to physically connect the world in the future."

Boeing Co. is testing hydrogen fuel cells on its ScanEagle3 pilotless military drone, but it's said hydrogen flight will take decades to develop and bring to market. Switching from kerosene to hydrogen is complicated and would require an overhaul of infrastructure on the ground at airports to support wide use of the new fuel. Hydrogen also needs to be cooled and is much more flammable than kerosene. The long certification timelines and the advancements that still need to be made with hydrogen mean that airlines and aerospace companies need to find an interim solution. That's why so-called sustainable aviation fuel (SAF) has emerged as a bridge to true zero-emissions aircraft.

SAF is chemically similar to jet fuel, but it doesn't require extraction of more petroleum. While these fuels release CO_2 when they're burned, their feedstocks contain carbon dioxide that was previously floating in the atmosphere, lending SAFs a greener tint than kerosene. Some are biofuels made from discarded cooking oil or municipal waste, for example, while others are synthetic fuels made by combining hydrogen and carbon captured from the atmosphere.

As part of the EU's push for carbon neutrality, the bloc wants all aircraft fuel to contain 2% SAF starting in 2025, rising to 63% by 2050—largely based on airlines using biofuels over synthetic alternatives. But for now, SAF production is severely limited, and airline executives say global annual output would barely fuel their fleets for a few days. Critics have pointed out that there might not be enough biological waste available to hit the targets and that the EU should require a higher share of synthetic fuels.



An Airbus fuel-cell propeller

While batteries have become common in ground transport, they have major drawbacks on aircraft: They're heavy and retain their weight throughout the journey, unlike liquid fuel that burns off. Batteries deliver much less energy for the weight than kerosene—250 watt hours per kilogram for batteries versus 12,000 Wh/kg for kerosene. That means the passenger compartment or cargo space would need to shrink to accommodate them. Hydrogen poses its own storage challenges, including cooling and the fact that it's explosive when it's a gas, raising the possibility of accidents resulting from fuel leaks.

Batteries do hold promise for smaller planes. Swedish hybrid-electric plane company Heart Aerospace AB is creating the ES-30 regional electric aircraft, and the company is slated to begin deliveries in 2028. With the aircraft powered by four electric motors, Heart expects that it will be able to fly 30 passengers a distance of about 200km on battery power alone and 400km with the hybrid system, which includes two reserve generators powered by jet fuel that charge the batteries.

Heart Aerospace is competing with a handful of projects from startups and units of established aircraft manufacturers to bring an electric passenger plane to market by the end of the decade.

Whether it's by making flying more expensive through taxes or developing green fuels or propulsion methods, cheap aviation is set to become relegated to the past in Europe, as the industry seeks to ditch its kerosene guzzling. "Flying will be more expensive when you do it more sustainably," says Gianluca Ambrosetti, CEO of Synhelion SA, a company testing SAF production using solar energy in Germany. "The good news is you'll still be able to fly." —*William Wilkes and Siddharth Philip*

THE BOTTOM LINE Europe is the test bed for technologies aimed at making aviation climate neutral. The investments required mean the days of cheap travel on the continent are numbered.

PROPELLER: COURTESY AIRBUS. ORCEL: BLOOMBERG

Q&A

A Case for Conservative Banking

UniCredit CEO Andrea Orcel on financial instability

Few bankers can match Andrea Orcel's depth of insight into the fast-changing financial landscape. The chief executive officer of Italy's UniCredit SpA runs banks in 13 countries across central and eastern Europe. And as the former head of investment banking at Switzerland's UBS Group AG, he has an insider's appreciation for why the swift collapse of its rival Credit Suisse AG was such a shock. Orcel sees little cause for concern over the merger of the banks into one behemoth. What does preoccupy him is the profound change in macroeconomic conditions, and he says industry leaders must be vigilant for trouble. The interview has been edited for length and clarity.

Suddenly, banks are failing on both sides of the Atlantic. Is there a banking crisis?

There is, and there isn't. We've had a shock in the US. We've had another shock in Switzerland. But these shocks are relatively localized. If you look at the capital strengths of banks—I'm talking about European banks—if you look at liquidity, deposits and all of that together, it's very difficult to see where the weak points are.

Do you see any parallels with the global financial crisis that began in 2007 or the US savings and loan crisis in the late 1980s?

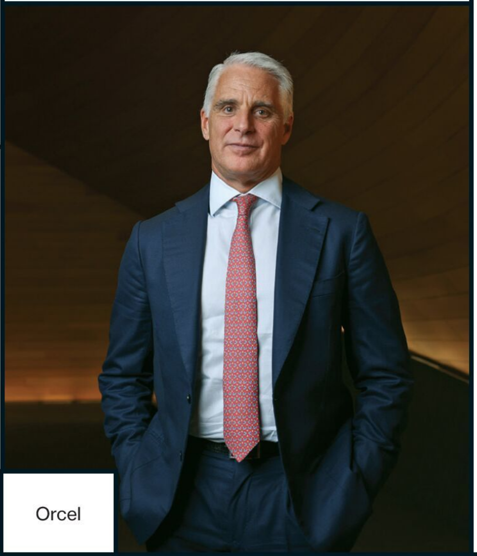
I don't. With all banks, especially the ones that are systemically important, it's essential to intervene quickly and decisively. Trust and confidence in the stability and strengths of the system are paramount. Credit Suisse was active in wealth management, investment banking and asset management—businesses that we specifically and most European banks aren't active in. Now it's being absorbed by UBS, and that's happening with the support of the Swiss National Bank and regulators. I think the repercussions will be limited.

How are you safeguarding UniCredit's business from these failures or others in the future?

We've just completed a major cleanup and retrenchment and learned a few lessons. We're particularly conservative on capital, liquidity and counterparty risk. We're just conservative. Everybody should be a bit paranoid. The world is changing and changing fast. What could blindside us? We try to be prepared. There should be a dialogue between banks and their regulators and among banks themselves: What do we see? What do you see? What do we need to protect the integrity of the system? We're interconnected. We need to help each other.

Has there been any change in the behavior of your retail customers or corporate clients, such as moving or withdrawing deposits?

This is one of the biggest differences between the US and Europe.



Orcel

Deposits in the US were already declining and prone to shifting into money-market funds. In Europe, deposits were increasing. And they remain stable, especially retail deposits. After a situation like the one we've just had, there's a flight to quality. The stronger, larger, better capitalized, more liquid, more conservative banks tend to benefit, and we've seen that in our numbers.

How will Credit Suisse disappearing change the competitive dynamics in financial services?

The question is whether buying Credit Suisse makes UBS a stronger competitor. If the integration goes as I hope it goes, then UBS will have unparalleled scale in wealth management, particularly outside the US, and global scale in investment banking.

How difficult will that integration be?

The most difficult thing is unifying the two cultures. And while it's hard to quantify, culture is critical to a successful integration. If that's done—and I'm confident it will be—the rest is just a matter of time.

What risks do you think demand more attention?

After years of globalization, positive momentum and a supportive economic environment, we're facing an uncertain future. Look at inflation, which will remain high for structural reasons. Look at interest rates. Look at geopolitics. Look at the economy. Look at deglobalization, the resetting of value chains. All these things are happening in parallel. It's almost inevitable that something bad will happen, and governments won't have a playbook because our playbook is for past crises, not the next crisis. That's why I tell my team: "The only certainty is uncertainty."
—*Erik Schatzker*

THE GAMBLER WHO BEAT ROULETTE

BY KIT CHELLEL
PHOTO ILLUSTRATION BY IRENE SUOSALO

FOR DECADES, CASINOS SCOFFED AS GAMBLERS DEVISED ELABORATE SYSTEMS TO GAIN AN ADVANTAGE OVER THE HOUSE. THAT CHANGED AFTER AN UNASSUMING CROATIAN WON MORE THAN £1 MILLION OVER SEVERAL NIGHTS AT A LONDON CLUB.

THE QUESTION—FOR CASINOS, COPS AND A *BLOOMBERG BUSINESSWEEK* REPORTER—WAS HOW, EXACTLY, HE DID IT

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One spring evening, two men and a woman walked into the Ritz Club casino, an upmarket establishment in London's West End. Security officers in a back room logged their entry and watched a grainy CCTV feed as the trio strolled past high gilded arches and oil paintings of gentlemen posing in hats. Casino workers greeted them with hushed reverence.

The security team paid particularly close attention to one of the three, their apparent leader. Niko Tosa, a Croatian with rimless glasses balanced on the narrow ridge of his nose, scanned the gaming floor, attentive as a hawk. He'd visited the Ritz half a dozen times over the previous two weeks, astounding staff with his knack for roulette and walking away with several thousand pounds each time. A manager would later say in a written statement that Tosa was the most successful player he'd witnessed in 25 years on the job. No one had any idea how Tosa did it. The casino inspected a wheel he'd played at for signs of tampering and found none.

That night, March 15, 2004, the thin Croatian seemed to be looking for something. After a few minutes, he settled at a roulette table in the Carmen Room, set apart from the main playing area. He was flanked on either side by his companions: a Serbian businessman with deep bags under his eyes and a bottle-blond Hungarian woman. At the end of the table, the wheel spun silently, spotlighted by a golden chandelier. The trio bought chips and began to play.

The Ritz was typical of London's top casinos in that it was members-only and attracted an eclectic mix of old money, new money and dubiously acquired money. Britain's royals were regulars, as were Saudi heiresses, hedge fund tycoons and the actor Johnny Depp. One cigar-chomping Greek diplomat was so dedicated to gambling he refused to leave his seat to use the toilet, instead urinating into a jug, so the story went.

But the way Tosa and his friends played roulette stood out as weird even for the Ritz. They would wait until six or seven seconds after the croupier launched the ball, when the rattling tempo of plastic on wood started to slow, then jump forward to place their chips before bets were halted, covering as many as 15 numbers at once. They moved so quickly and harmoniously, it was "as if someone had fired a starting gun," an assistant manager told investigators afterward. The wheel was a standard European model: 37 red and black numbered pockets in a seemingly random sequence—32, 15, 19, 4 and so on—with a single green 0. Tosa's crew was drawn to an area of the betting felt set aside for special wagers that covered pie-sliced segments of the wheel. There, gamblers could choose sections called *orphelins* (orphans) or *le tiers du cylindre* (a third of the wheel). Tosa and his partners favored "neighbors" bets, consisting of one number plus the two on each side, five pockets in all.

Then there was the win rate. Tosa's crew didn't hit the right number on every spin, but they did as often as not, in streaks that defied logic: eight in a row, or 10, or 13. Even with a dozen chips on the table at a total cost of £1,200 (about $2,200 at the time), the 35:1 payout meant they could more than double their money. Security staff watched nervously as their chip stack grew ever higher. Tosa and the Serbian, who did most of the gambling while their female companion ordered drinks, had started out with £30,000 and £60,000 worth of chips, respectively, and in no time both had broken six figures. Then they started to increase their bets, risking as much as £15,000 on a single spin.

It was almost as if they could see the future. They didn't react whether they won or lost; they simply played on. At one point, the Serbian threw down £10,000 in chips and looked away idly as the ball bounced around the numbered pockets. He wasn't even watching when it landed and he lost. He was already walking off in the direction of the bar.

It wasn't the amount of money at stake that made the Ritz security team anxious. Customers routinely made several million pounds in an evening and left carrying designer bags bulging with cash. It was the *way* these three were winning: consistently, over hundreds of rounds. "It is practically impossible to predict the number that will come up," Stephen Hawking once wrote about roulette. "Otherwise physicists would make a fortune at casinos." The game was designed to be random; chaos, elegantly rendered in circular motion.

Even so, gamblers have come up with plenty of elaborate mathematical systems to beat it—Oscar's Grind, the D'Alembert. Simple ones, too, such as betting on black then doubling on every loss until you win. Casino owners love these strategies because they don't work. The green 0 pocket (with an additional 00 pocket on American wheels) means even the highest-odds bets, on red or black for example, have a slightly less than half chance of success. Everyone loses eventually.

Except for Niko Tosa and his friends. When the Croatian left the casino in the early hours of March 16, he'd turned £30,000 worth of chips into a £310,000 check. His Serbian partner did even better, making £684,000 from his initial £60,000. He asked for a half-million in two checks and the rest in cash. That brought the group's take, including from earlier sessions, to about £1.3 million. And Tosa wasn't done. He told casino employees he planned to return the next day.

A week later—after the events at the Ritz had been picked over by casino staff, roulette wheel engineers, police and lawyers—the British press got wind of Tosa's epic run. The *Mirror* reported that an unidentified high-tech gang had hit the casino with a "laser scam," pairing a device hidden in a mobile phone with a microcomputer to achieve the impossible.

It was as good a theory as any. But closer observers weren't so sure, and the case remained a mystery even to casino insiders almost two decades later. "We still lose sleep over that one," a gambling executive told me.

I spent six months investigating the clandestine world of professional roulette players to find out who Tosa is and how he beat the system. The search took me deep into a secret war between those who make a living betting on the wheel and those who try to stop them—and ultimately to an encounter with Tosa himself. The British press got plenty wrong in their reports about what happened on the night of March 15, 2004. There was no laser. But the newspapers were right about one thing: It is possible to beat roulette.

John Wootten had just finished his first day as security chief at the Ritz when he got a call from a colleague about some unusual activity at the roulette tables. He was in a West End pub having a beer with friends, celebrating his new job at one of the city's most prestigious venues.

We're losing money rapidly, the voice on the other end of the phone told him. What should we do? Get the names of the gamblers and call back, Wootten said.

Wootten was a burly former soldier in the Grenadier Guards, whose red coats and bearskin hats can be seen guarding Buckingham Palace. He also ran a punk rock pub before getting into the casino business. Wootten knew to brace himself for trouble. Casino staff didn't call so late without good reason.

Word came back by the time he'd finished his pint. One of the players was Niko Tosa. The others were Nenad Marjanovic—from Serbia, though he used an old Yugoslavian passport—and Livia Pilisi, of Hungary. Wootten had never heard of them, but he ordered staff to cut them off and hightailed it to the Ritz. By the time he arrived, the mysterious gamblers were gone.

The following day, Wootten came in early to investigate. He found no obvious sign that the roulette wheel or table had been tampered with. Watching the CCTV footage, he noted that Tosa and Marjanovic jumped up to place their bets a few seconds into each spin. They must have been using some sort of computer, he thought.

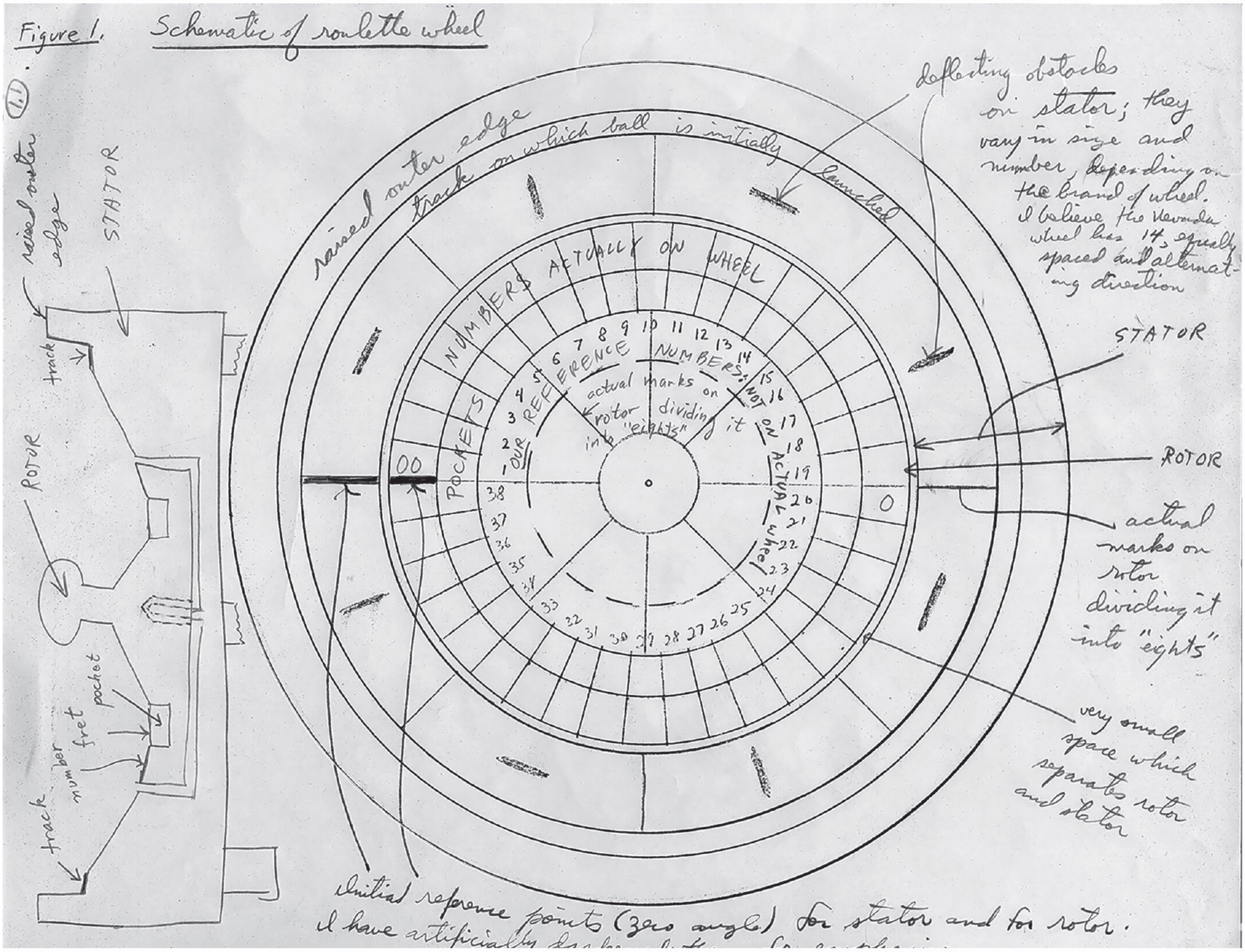
▲ Thorp in 1964

Wootten had tried to give a speech at an industry event a few years prior about the threat to casinos from tiny, increasingly powerful computing devices, capable of processing feats humans could only dream of. He was laughed off stage. Ridicule still ringing in his ears, he made it his business to learn everything he could about the subject.

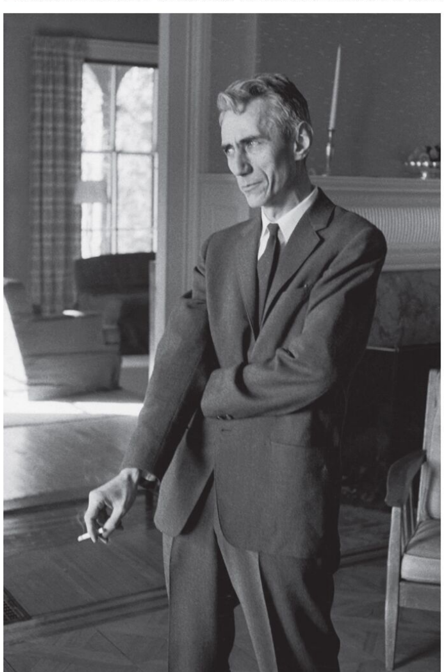
Computer-assisted roulette was born in the 1960s, the progeny of rebellious academics at elite American universities. If scientists armed with microprocessors could predict the movement of the stars and planets, why not roulette? It was a matter of physics. Edward Thorp, an American mathematician and gambling pioneer, made the first serious attempt, along with Claude Shannon, the MIT professor who more or less invented information theory. From their point of view, roulette wasn't totally random. It was a spherical object traversing a circular path, subject to the effects of gravity, friction, air resistance and centripetal force. An equation could make sense of those.

Modeling got tougher, though, once the ball moved in from the outer rim to the spinning central rotor, ricocheting off the metal slats and the sides of the numbered pocket dividers—a second, chaotic phase that scientific consensus held would scramble any prediction. Thorp and Shannon discovered, however, that by timing the speed of the ball and the rotor, they could ▶

PREVIOUS SPREAD: GETTY IMAGES. THIS SPREAD: LEIGH WIENER



▲ A schematic for a roulette wheel and wearable computer, from Thorp's papers



▲ Shannon in 1962

◀ calculate the ball's likely destination. There were errors, but Thorp was delighted to find that their predictions were normally off by only a few pockets.

To run their equation, the two mathematicians built and programmed the world's first wearable computer, a matchbox-size gadget wired to a timing switch hidden inside a shoe. Once Thorp had calibrated the device to adjust to a specific wheel's dynamics, all he had to do was tap his foot twice to get speed readings. The system worked, at least in a laboratory setting—their Sixties-era wiring kept fritzing out when they tried it in a casino.

A decade later, J. Doyne Farmer, a physics student at the University of California at Santa Cruz, took up the challenge. Farmer dreamed of creating a utopian community of hippie inventors funded by gambling profits. He and his partners called their venture Eudaemonic Enterprises, after Aristotle's term for the fulfilling sensation of a life well lived. Like Thorp before him, Farmer learned that roulette was more predictable than anyone imagined, and also that making the science work amid the sweat and noise of a real casino was almost impossible. His device used a hidden buzzer that told the wearer which of eight sections, or "octants," the ball would likely drop into. At field tests in Lake Tahoe and Las Vegas casinos, the computer shorted out or overheated, zapping the wearer or burning their skin. The Eudaemons wasted several years and thousands of dollars before abandoning the project in the early 1980s. One of them published a book about their adventures called *The Eudaemonic Pie*. In the end, the book concluded, Eudaemonia wasn't a goal to be attained, but a journey.

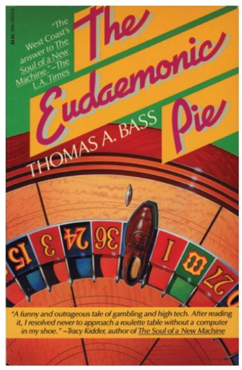
Wootten had read *The Eudaemonic Pie*, and he knew how far computers had advanced since its publication. As he considered Tosa's method the day after the big Ritz score, he concluded that the six-second pause before the Croatian placed his bets was enough time to clock rotations of the ball and wheel and have a computer produce a forecast. He decided to call the cops.

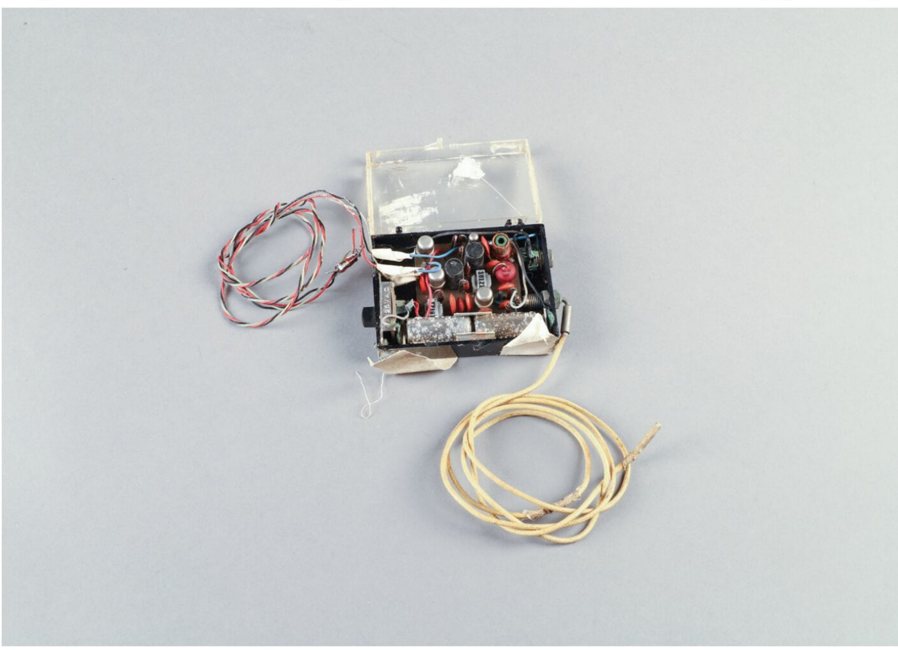
Tosa, Marjanovic and Pilisi returned to the Ritz at 10 that night, as promised. This time they were led to a private room where a squad from the London Metropolitan Police was waiting. An officer politely informed them they were under arrest on suspicion of "deception" and led them away to be interviewed at a nearby police station. Once the gamblers were out of earshot, Wootten urged the cops to check their shoes and clothes for hidden devices.

Tosa and his companions reacted to being arrested with the same surreal calm they'd shown at the roulette wheel. At the station, they were interviewed separately through an interpreter. Tosa was robotically unhelpful, declining to answer questions. Marjanovic was more talkative but just as confounding. He claimed to be a professional gambler of such skill at roulette that he could win 70% of the time. Only "self-discipline" limited his profits, he said. Both denied using any kind of computer.

Pilisi, who seemed to be romantically involved with Marjanovic, was vague about how she knew Tosa and said she knew little about her partner's gambling. A detective tried showing her CCTV footage of Marjanovic playing at the Ritz. "That's your boyfriend winning half a million pounds," he said, gesturing at the screen. "It's like winning the lottery. You don't show any emotion." Pilisi shrugged. "So what?" she replied.

▼ *The Eudaemonic Pie*, published in 1985





▲ A wearable roulette computer developed by Shannon and Thorp

The police had seized four cellphones and a PalmPilot-type device, which were taken away to be analyzed. Searching the group's hotel rooms, officers found several hundred thousand pounds and a list of casinos marked with symbols: ticks, crosses, pluses and minuses. The detective told Wootten that, given the sums in question, the Met's money laundering division would be taking over. In the meantime, the force authorized the Ritz to halt payment on Tosa and Marjanovic's checks, so they couldn't take the casino's money and flee.

Later that same evening, out on bail, Tosa, Marjanovic and Pilisi stopped outside the casino and had a brief, bizarre conversation with a doorman who later reported it to his superiors. Tosa told the doorman in Balkan-accented English that the Ritz's owners were bad people who were looking for an excuse not to pay. He and his companions were going to sue to get their money, he warned.

About six months later, a chauffeured Mercedes-Benz pulled up outside the Colony Club casino, not far from the Ritz, and deposited two men who said they could prove it was possible to win at roulette without cheating.

The police investigation had stalled. Despite numerous searches, they hadn't found earpieces, wiring or timers. Police IT specialists had found evidence of data being deleted from the seized cellphones—suspiciously, some felt—but no sign of any roulette-beating software.

Tosa and the other suspects had lawyered up and were refusing to answer any more questions. Instead, their attorney suggested, police should watch a demonstration showing how someone could conquer roulette without resorting to fraud. An executive at the Colony Club agreed to host and invited security chiefs from across the West End gambling scene.

Tosa himself wouldn't take part. Instead, the attorney put forth a grim-faced Croatian named Ratomir Jovanovic to give the demonstration alongside his Lebanese playing partner, Youssef Fadel. The two had made approximately £380,000 playing roulette at various London venues around the same time as Tosa, using the same distinctive late-betting style. Police already suspected, though they couldn't prove it, that Jovanovic was part of a gambling syndicate run by Tosa. ▶

◀ Jovanovic's presence at the demo seemed to confirm their theory.

When Jovanovic and Fadel arrived at the Colony, they were led to a private roulette chamber to find not only police, as they'd expected, but also half a dozen casino security bosses in dark suits. Most were former soldiers like Wootten, some had visible scars or warped knuckles, and all looked hostile. Fadel's smile vanished. Jovanovic tried to bolt, but one of the casino guys kicked the door shut with his heel. "You're not going anywhere," he said, according to several attendees.

Wootten watched, gripped, as Jovanovic took his place at the cream-colored leather fringe of a roulette table. The Croatian's method was recognizable from footage of Tosa at the Ritz: the pause, the wager, the spread of chips. Like Tosa, he used the area of the betting felt set aside for wagering swiftly on segments of the wheel, where he could cover five adjacent pockets with a single chip on the "neighbors" section.

But Jovanovic couldn't make it work. He didn't hit anything for the first few spins and barely improved from there. A casino executive started mouthing off about them wasting his time. The Croatian blamed bad vibes in the room for messing with his instincts. "We have heart for roulette," he said. "We've lost our hearts." Wootten didn't buy it. How could this be any more stressful than playing live, with real money?

The police detective intervened to explain that everyone suspected the gamblers of using a hidden computer. We're not doing that, Jovanovic offered. "We can play naked," he said. At this, one of the casino representatives grabbed at the Croatian's jacket as if to strip him. "Go on, then!" The detective had seen enough and ended the demonstration before things could turn ugly. He escorted the gamblers out.

To a cop's eyes, Tosa and his gang still looked like criminals. They had large sums of cash, burner cellphones and passports showing travel to Angola and Kazakhstan. What exactly was their crime, though? Even if it could be proven that they'd used a computer, the answer wouldn't have been clear. Nevada had banned the use of electronic devices in casinos back in the 1980s, but the UK had no such prohibition. The country's gaming statute, which dated to 1845, was created to stop noblemen from blowing their family fortunes at West End clubs. It didn't mention computers.

> "We can play naked," Jovanovic said. A casino representative grabbed at the Croatian's jacket as if to strip him. "Go on, then!"

Not long after the Colony demo, the police phoned Wootten to say they wouldn't be pressing charges against Tosa, Marjanovic or Pilisi, or continuing the investigation into Jovanovic and Fadel. Detectives hadn't found any evidence of dishonesty or cheating, nor had they been able to establish a definitive link between the two groups.

Wootten was aghast. He imagined having to tell the casino's billionaire owners, a conversation he'd been hoping to avoid. Was there any legal way to stop Tosa and the others from collecting their winnings? he asked. No, the officer said. There was no other option. The Ritz would have to pay up.

Wootten was determined not to let Tosa's victory be the end of the matter, and he wasn't the only one. Wootten's friend Mike Barnett—once an electrician, then a professional gambler, then a high-paid casino security consultant—had been helping the Ritz and the Metropolitan Police understand how predictive roulette worked. The casino had paid for Barnett to fly in from Australia in the middle of the Tosa investigation, bringing along his own roulette timers and predictive software. He couldn't be sure Tosa had used computers, but it was nevertheless an opportunity to convince skeptical cops and staff that roulette prediction wasn't a myth.

In presentations that were seen by representatives of virtually every major casino group in the UK, as well as the national regulator, the Gambling Commission, Barnett invited audiences to try using a handheld clicker to time video footage of a moving wheel and ball precisely enough for the computer program to work its magic. Most could, and once they'd done it themselves, some of the mystery fell away. "To make money in roulette, all you need to do is rule out two numbers," Barnett liked to say, flashing a gold Rolex and diamond encrusted ring as he held up his fingers. With two numbers eliminated, the odds became slightly better than even, flipping the house's slender advantage.

The Gambling Commission ordered a government laboratory to test Barnett's system. The lab confirmed his thesis: Roulette computers *did* work, as long as certain conditions were present.

Those conditions are, in effect, imperfections of one sort or another. On a perfect wheel, the ball would always fall in a random way. But over time, wheels develop flaws, which turn into patterns. A wheel that's even marginally tilted could develop what Barnett called a "drop zone." When the tilt forces the ball to climb a slope, the ball decelerates and falls from the outer rim at the same spot on almost every spin. A similar thing can happen on equipment worn from repeated use, or if a croupier's hand lotion has left residue, or for a dizzying number of other reasons. A drop zone is the Achilles' heel of roulette. That morsel of predictability is enough for software to overcome the random skidding and bouncing that happens after the drop. The Gambling Commission's research on Barnett's device confirmed it.

The government's report wasn't released publicly after it was finished in September 2005; casinos made sure of that. But among industry figures, it gave an official imprimatur to a once-fanciful idea. The study also offered recommendations for how casinos could fight back: Shallower wheels. Smooth, low metal dividers between the number pockets. Or no dividers at all, only scalloped grooves for the ball to settle into. These design features increased the time a ball spent in the hard-to-predict second phase of its orbit, hopping around the pockets in such chaotic fashion that even a supercomputer couldn't work out where it was headed.

Most important, roulette wheels had to be balanced with extraordinary precision. A quick check with a level was no longer enough. Even a fraction of one degree off, and the ball might end up in Barnett's drop zone.

London casinos were some of the first to order new equipment to meet the specifications. The Ritz changed all its wheels within months. Word spread quickly. At an industry event in Las Vegas, Barnett asked an audience of gambling executives how many thought it was possible to predict roulette. Hardly anyone raised a hand. By the end of his presentation, when he asked again, almost everyone did.

As the gaming industry began taking the threat more seriously, wheels were developed with laser sensors and built-in inclinometers to detect even a hair's breadth of tilt. The stakes were ▶

▼ Wootten outside his shed in London

PHOTOGRAPH BY CARLOTTA CARDANA FOR BLOOMBERG BUSINESSWEEK

◀ rising, as gambling moved online and millions of people around the world began to wager on livestreams from their home computers or cellphones.

One of the biggest livestreamers was Evolution Gaming Group. Founded in 2006 with some casino equipment and a small office in Latvia, the company charged betting firms a percentage of revenue to use its platform, which became a wildly lucrative niche. About a decade ago, according to several former employees, Evolution staff made a strange discovery. A handful of players were winning at statistically absurd rates on the roulette wheels spinning day and night at its facility in Riga. Engineers investigated and pinpointed a culprit: the floor. Specifically, there was a gap between its solid concrete base and the carpeted playing surface laid down just above, a standard feature in studios where audio is recorded. When a croupier stood next to the televised table, the floor flexed ever so slightly, not enough to catch the human eye but tilting enough to help anyone using prediction software. One online user won tens of thousands of dollars from a major Evolution partner before engineers installed platforms to steady the wheels.

As Evolution grew, opening outlets in Belgium, Malta and Spain, so did the ingenuity of the players exploiting any flaw in its operations. One gambling brand's croupiers worked in a hot room cooled by a fan that Evolution found altered the movement of the ball. Brand-new equipment might arrive with unglued pockets or start to degrade and lose its randomness after only a few weeks of round-the-clock use. Sometimes, wheels got so dependable that gamblers didn't even need a predictive equation. They could simply bet the favored section over and over. Always, there were players who seemed able to spot the imperfections before Evolution's analysts could.

Tosa adopted different aliases, complete with fake IDs. But the piercing gaze, the long nose, were unmistakable. There he was at a Romanian casino. There he was again, in London. Then Poland. Slovakia.

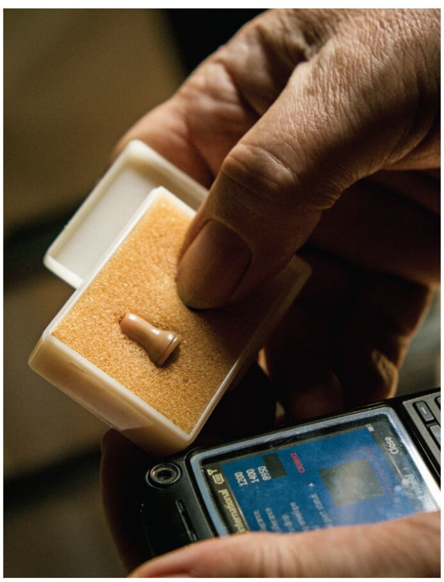
In response, Evolution hired an army of "game integrity" specialists and paid a fortune to consultants, including Barnett. The company developed software to track wheels in real time and identify whether any section was winning more than statistical models said it should. It gave croupiers a screen telling them to toss the ball more quickly or slowly, as required. By 2016, Evolution employed 400 people in its game integrity and risk department, according to an annual report in which it also warned that its adversaries were getting more sophisticated with every passing year. (Asked for comment, a company spokesman said, "Evolution works hard to protect game integrity and it is a prerequisite for our business.")

According to Barnett, there's a new generation of online roulette sharps who no longer need human-operated switches to time the ball and wheel. Instead, they deploy software that scans the video feed and does it for them, all from a home computer with no security guards in sight. Gambling firms are fighting back with innovations like random rotor speed, or RRS, technology, using software to algorithmically slow the wheel differently on each spin.

There's one surefire way casinos could stop prediction: calling "no more bets" before the ball is in motion. But they won't. That would cut into profits by limiting the amount of play and deterring casual gamblers. Instead, the industry seems willing to pay a toll to a select few who know the secret, while trying to design out the flaws that make the game vulnerable. Walk into a casino anywhere in the world today. Look at the depth of the pockets, the height of the wheelhead, the curvature of the bowl, and you can see how Tosa and his counterparts have reshaped roulette.

John Wootten never forgot Niko Tosa. Part of him admired the Croatian, who was a cut above the grubby casino cheats he was accustomed to dealing with. If anything, Tosa helped Wootten's career. He traveled the world to talk about the Ritz case, giving speeches in Macau, Las Vegas and Tasmania. Every so often, he was thrilled to get word of Tosa's whereabouts from someone in his global network.

As the years went on, Tosa adopted different aliases, complete with fake IDs,



and switched up his playing partners. But the piercing gaze, the long beak of a nose, were unmistakable. There he was at a Romanian casino in 2010, captured by a security camera with his hand stuffed into a trouser pocket (where, staff assumed, he must be hiding something). There he was again, in London, trying to get into a club in an unconvincing gray wig. Then Poland. Then Slovakia.

In 2013 the furious owner of a casino in Nairobi contacted Wootten about a Croatian who'd won 5 million Kenyan shillings ($57,000) playing roulette. The gambler would watch the wheel for a few seconds, then place neighbors bets. When challenged, he acted as if he was "expecting a confrontation," the casino owner wrote in an email. Could it be the same Croatian who'd hit the Ritz almost a decade earlier?

When Wootten confirmed the man was one and the same, the casino owner phoned and said he'd contacted friends in the Kenyan government who he hoped could have Tosa arrested. Wootten wished him luck and hung up. He took the incident as a sign the gaming industry's defensive measures were working. Tosa must be getting desperate, having to travel to Africa to find vulnerable wheels. There were casinos far from London where, Wootten knew, they wouldn't hesitate to break a suspected cheat's fingers.

Wootten retired in 2020, after the Ritz shut its doors permanently during the Covid-19 pandemic. Over the years he'd collected a cabinet full of increasingly ingenious devices: PalmPilots, reprogrammed cellphones, flesh-colored earpieces, miniature buttons and cameras. He knew of one player who'd hidden a roulette timer in his mouth and had heard rumors of another who'd tried to get a microprocessor surgically embedded in his scalp.

Yet Tosa had never been caught with so much as a thumb drive. Could it really be, Wootten wondered, that the man who'd done more than anyone to raise the alarm about computer roulette hadn't actually used one? ▶

Wootten's device collection in his shed

PHOTOGRAPHS BY CARLOTTA CARDANA FOR BLOOMBERG BUSINESSWEEK (3)

◀ He knew, too, that some of the early pioneers of the field had observed a curious phenomenon. After using predictive technology thousands of times, they'd developed a sense of where the ball would land, even without the computer. "It's like an athlete," Mark Billings, a lifelong player and author of *Follow the Bouncing Ball: Silicon vs Roulette*, said in an interview. "At some point all this stuff comes together. You look at the wheel. You just know." Casinos call it "cerebral" clocking. All that's needed is a drop zone and a potent, well-trained mind.

Wootten and Barnett debate the point to this day. A roulette computer was a neat explanation for casino staff, who didn't want to look too closely at their shoddy equipment, and for Wootten, who wanted to prove a point to all the executives who'd laughed at him. But when I spoke to Barnett, he argued that the wheel at the Ritz was so old and predictable that Tosa wouldn't have needed a computer to defeat it. "Blind Freddie could beat the wheel they played," he said.

Back then, he'd wanted to believe, too. "I wanted to ride into Scotland Yard on my white horse and expose the M.O.," he recalled. "The problem was there was not the slightest shred of evidence."

Without that, Barnett said, there was only one thing left to do: "The only way we'll really know is if you talk to Niko."

I figured Tosa would be hard to track down. He's spent most of his career trying not to be found. Sure enough, there was no record of him in company or property registries, or in news reports or on social media. I managed to get hold of a list of his playing partners and worked my way through it, but they all turned into dead ends.

Business associates of his Ritz companions, Pilisi and Marjanovic, ignored calls and emails and blocked my number when I texted. I did find one Serbian businessman who seemed to know them both, but he said he'd lost touch years ago and was trying to find them himself. When pressed, he grew irate. "What part don't you understand?" he asked.

I thought I'd caught a break when one of Tosa's more recent partners listed an address near my home in West London, but the man's ex-wife answered the door and said he'd moved back to Montenegro when they separated. So it went.

Eventually, I realized the different addresses Tosa had given casinos over the years were clustered along the same stretch of Croatian coast, south of Dubrovnik. They were tiny villages, mostly. I hoped someone might have heard of him, so I sent a colleague to ask around. After striking out a few times, he found a former neighbor and showed him Tosa's photograph. He has a holiday villa nearby, the neighbor said, just up the road from the local convenience store. Try him there.

My colleague found Tosa outside the house, working on an SUV. He was friendly enough, though he said he didn't talk to reporters. He offered a phone number but didn't answer it the numerous times I called.

In November, I flew to Dubrovnik, the picturesque medieval fort city that was one of the main backdrops for *Game of Thrones*. The day I arrived, a storm blew in off the Adriatic, slamming sheets of rain against the cliffs and sending the few off-season tourists scurrying for their hotels. Tosa's villa was an hour's drive down a winding coastal road. There was a solid iron gate blocking the entrance to his front door and no one home, so I folded a note into a plastic folder to keep out the rain and slid it under the gate.

The town's only cafe was open and full of chain-smoking locals in sweatsuits. It was an unpretentious place decorated with *Godfather* posters. I ordered a coffee and struck up a conversation with the barman. Did he know that probably the world's most successful roulette player had a place around the corner? No, he said—he never gambled. He thought it was a good way to lose money.

I showed him a picture of Tosa. He said he didn't recognize the man, though he was curious how I'd found the photo. After a while, I left a tip, said goodbye and walked off, defeated, in the direction of my car. The barman came running out into the downpour. "I just called him," he said. "He is my good friend. I wanted to check with him first. He is in Dubrovnik." Tosa phoned me a few hours later, and we arranged to meet at a fish restaurant in the old harbor.

▲ A village in the region of Croatia where Tosa is from

Tosa was adamant that he'd never used a roulette computer. Between glasses of white wine and plates of locally caught squid, he burst out, "You can call me Nikola Tesla if I have such a device!"

In person, he was even taller and more birdlike than I'd expected. He spotted me in the street outside and pulled me into an awkward embrace under his umbrella, saying, "Oh oh oh oh." Inside, he introduced me to a friend and a younger relative who both spoke good English and would translate when needed. Niko Tosa, they explained, wasn't his real name. I agreed not to publish the actual one, because they said he had enemies who were less forgiving than John Wootten.

Tosa was by turns enigmatic, jovial, prickly, paranoid, frank. Also generous—he insisted on buying a round of single malt whiskies. He readily admitted to playing roulette using fake identity documents and to disguising himself with a wig and fake beard. "What's wrong with that?" he asked. He had no problem referring to some of his former playing partners as criminals. One of them had been gunned down in Belgrade in 2018, killed in an apparent Balkan-mafia feud. Tosa had fallen out with others over money.

But he was adamant that he'd never used a roulette computer. The idea was like something from James Bond, he said with a laugh, adding, "We are peasants." As I pressed him about computers, he threw up his hands in exasperation and started to argue with his friend. Is he angry, I asked. "No, that's just how he talks," the friend replied. "He's asking how he can make you understand."

I began to suspect that Tosa had agreed to talk to me specifically to make this point. Between glasses of white wine and plates of locally caught squid, he burst out, "You can call me Nikola Tesla if I have such a device!"

So how did Tosa do it, then? Practice, he said. They showed me a video clip of a glistening roulette wheel Tosa kept in his house to train his brain. How had he learned? A friend taught him—Ratomir Jovanovic, the Croatian who'd given the disastrous demonstration at the Colony Club. London police had been right that the two were working together.

The condition of the wheel is vital, Tosa said. That was why he'd sought out a particular table at the Ritz—he'd played the wheel enough to confirm that he could beat it. He'd been able to identify it on sight even after the casino moved it into the Carmen Room.

I think I believed him when he said he didn't use a computer. Later on, for a sanity check, I contacted Doyne Farmer, the physicist whose roulette prediction exploits are chronicled in *The Eudaemonic Pie*. "I do think it's conceivable that someone could do what we do without a computer, providing the wheel is tilted and the rotor is not moving too fast," said Farmer, who's now a professor at the University of Oxford. He compared cerebral clocking to musical talent, suggesting it might activate similar parts of the brain, those dedicated to sound and rhythm.

Then again, if Tosa had concealed a tiny contraption, I don't think he'd have told me. It seemed to me an uncomfortable life, traveling the world in search of casinos where he wouldn't be recognized, waiting for security teams monitoring closed-circuit cameras to realize he was too good. Tosa said he'd been beaten up by casino thugs more than once. Sitting at the table in Dubrovnik, I asked him if he ever felt hunted. He looked baffled by the question. "Why would I?" The casinos were the prey; he was the hunter.

His young relative said he could remember the day, years back, when Tosa first pulled up in a Ferrari. Their hometown in the foothills of the Dinaric Alps isn't rich by Croatian standards, though Tosa is from a prominent family. He seemed to share traits I've seen in other professional gamblers: an aversion to the grind of nine-to-five and a need to live on his own terms, whatever the risks. Ultimately, what set him apart from other roulette predictors was his willingness to go big. Most players only dare win a few thousand dollars at a time, for fear of being discovered. "Like squirrels," Tosa said with contempt. If he hadn't been arrested at the Ritz, he claimed, he would have gone back the next night and made £10 million. He felt the casino had gotten off lightly.

Toward the end of our encounter, Tosa asked exactly when my story would be published. Why did he want to know? He was planning his next international trip, he said, smiling. He didn't want me to blow his cover. Ⓑ *—With Vladimir Otasevic, Daryna Krasnolutska, Peter Laca and Misha Savic*

KIT CHELLEL


CHIPOTLE
MEXICAN GRILL
STARBUCKS
amazon

Unions' Secret Weapons

At Starbucks, Amazon.com and other big employers, activists known as "salts" have been a key to labor success. And they say they're just getting started

By Josh Eidelson
Illustration by Woshibai

If you want to unionize a workplace, Will Westlake was saying, get used to unclogging the drains. At a secret off-hours gathering held in Rochester, New York, in March, the 25-year-old former barista told a few dozen labor activists that a great way to build trust with co-workers and bosses is to volunteer for thankless chores. In his case, that meant spending months at a Starbucks outside Buffalo in 2021 getting on his knees and reaching beneath the sinks to yank loose the grimy mix of mocha chips, espresso beans, congealed milk and rotten fruit that regularly stopped things up. "Be the person who's willing," Westlake said. "It's going to make the company less suspicious of you."

The proof, he told the crowd, came toward the end of 2021, after baristas at his Starbucks and others in the area had filed federal petitions to hold union elections. Executives and managers arrived from across the country to work shifts at the cafes and conduct mandatory meetings about the potential dangers of organizing. According to Westlake, the then-president of Starbucks Corp.'s North American division personally warned at least one new hire at his store to be careful about trusting other staffers, naming several baristas she suspected of being covert union operatives. Confused and distressed, the hire called up a trusted colleague that the big boss hadn't named: Westlake. (Starbucks has denied all claims of anti-union activity at its shops.)

The practice of joining a workplace with the secret aim of organizing it is called "salting." Westlake was addressing recruits at the Inside Organizer School, a workshop held a couple times a year by a loose confederation of labor organizers. At these meetups, experienced activists train other attendees in the art of going undercover. Speakers lecture and lead discussions on how to pass employer screenings, forge relationships with co-workers and process the complicated feelings that can accompany a double life. Most salts are volunteers, not paid union officials, but unions sometimes fund their housing or, later, tap them for full-time jobs. Workers United, the Service Employees International Union affiliate that's home to the new Starbucks union, hired Westlake as an organizer around the time the coffee chain fired him last fall.

Through interviews and exclusive visits to undercover training sessions over the past year, *Bloomberg Businessweek* got an unparalleled look at the revival of American salting, which has been around for a century. Until now, salts have been the mostly secret ingredient in a once-in-a-generation surge of union organizing that's spread from Starbucks and Amazon.com Inc. to other Fortune 500 companies in the Covid-19 era. At least 10 undercover activists, including Westlake, landed jobs at Starbucks cafes in the Buffalo area, where they quietly laid the groundwork for the first successful organizing campaign among the company's US employees in decades. That victory inspired hundreds more successful union votes at Starbucks and other companies. Early on, a group of six salts made up half the organizing committee for the Amazon Labor Union that won an election at an 8,000-person warehouse in the Staten Island borough of New York last spring. "They didn't make or break us, but they were definitely helpful," says the Amazon campaign's most prominent organizer, Christian Smalls.

High-profile wins have helped fuel salt recruiting. Last year, thousands of members of the Democratic Socialists of America said in an internal survey that they were interested in pursuing jobs in workplaces that would also be strategic targets for organizing. "Salting is really important and will definitely play a part in a lot of these upcoming battles," says Atulya Dora-Laskey, a 23-year-old DSA member and Chipotle employee who helped lead the Mexican food chain's first-ever union success. Dora-Laskey says that he wasn't thinking about organizing until after he got hired, but that his victory has helped lead salts to take jobs at other Chipotles and that he's advising them on their campaigns.

Interest in salting has been buoyed by a tight labor market and a broader resurgence in left-wing activism, especially ▶

◀ among Gen Z. Some salts come from relatively privileged backgrounds—meaning they can better afford to get fired—but others are working-class people who go undercover at the sorts of jobs they've already been doing. Westlake was working full time as a barista to save money for college in 2017 when Workers United guided him through unionizing his first cafe before helping him do the same thing at other shops. His mother was a restaurant manager who didn't have health insurance and died of cancer when he was 14 years old. "That's been a big part of why I've gotten involved," he says.

The resurgence of salting also reflects the desperation of the American labor movement. Workers who don't remember Sept. 11 can scarcely imagine a time when collective bargaining was the norm. Union representation as a share of the US workforce peaked in 1954, and after decades of decline, it now sits at a record low 6% of the private sector. US productivity rose by two-thirds from 1974 to 2018, but average inflation-adjusted wages hardly budged.

Still, companies also seem to recognize that they're more vulnerable to organizing tactics like salting than they thought. While the practice is legal, business groups are urging leaders in the House of Representatives, where Republicans regained control in January, to pass a law that would make it easier to reject or fire workers who are found to be salts. "There is a basic duty of loyalty that employees have to their employer," says Roger King, a senior counsel for the HR Policy Association, a trade group.

Starbucks and other companies have also sought to dismiss any unionization effort involving undercover organizers as illegitimate. Howard Schultz, the coffee chain's iconic three-time chief executive officer, stressed in his March 29 testimony to the Senate labor committee that the key organizer at his company was also on a union's payroll. "If that's not a nefarious act, I don't know what is," he said. Schultz, who retook the CEO job on an interim basis last year as the union votes multiplied, stepped down slightly ahead of schedule on March 20 amid growing scrutiny of the company. The committee chair, Bernie Sanders, had threatened to subpoena Schultz to appear at the hearing, an investigation of alleged illegal union-busting at Starbucks.

In a statement, Workers United President Lynne Fox noted that the campaign has spread far beyond Buffalo, and said her union represents more than 8,000 Starbucks employees so far. "Workers United is proud to stand with all of those workers, and the thousands more that will join them in the coming months," she said.

Salting can backfire when it leaves potential union supporters feeling manipulated. Some workers who've stood up to organize with salts' backing have gotten fired. But salts say they're not forcing unionization on anyone—they're just showing people that it's possible and how it can be done. While Westlake acknowledges that salting gets awkward, he bristles at the idea that salts aren't loyal or dedicated enough to count as real workers. He says that he's poured a whole lot more coffee than the Starbucks higher-ups who flew to Buffalo to talk about the dangers of unions and that he spent weeks laid up with a pinched nerve after all his drain-unclogging. "I don't think executives should really be throwing stones," he says. "Who's more of a fake worker than them?"

Salting draws its name from a bygone form of fraud: sprinkling gold in a spent mine to trick someone into buying it. Over the past century, salts have gone to work in just about every US industry, sometimes calling the practice "industrializing" or, more awkwardly, "colonization." Stories from salting's previous peak, circa the Great Depression, have been a touchstone of Inside Organizer School workshops since a pair of longtime organizers, Richard Bensinger and Chris Townsend, began holding them in 2018. Those tales, like one salt's account of swapping names and haircuts to keep getting hired at the same 1930s stockyard, have remained a fixture now that Bensinger's protégé, 25-year-old Workers United organizer Jaz Brisack, is largely spearheading the trainings.

Brisack, who spent their home-schooled teenage years in Tennessee working at Panera Bread, had been waiting a long time to salt somewhere. They'd defied their Christian fundamentalist parents by renouncing religion, and the labor movement offered an outlet for rebellion and a stand-in for the sense of community and greater purpose that faith used to provide. While they were studying public policy at the University of Mississippi, a professor introduced them to


Westlake

PHOTOGRAPHS BY MALIK RAINEY FOR BLOOMBERG BUSINESSWEEK

Reeve

Bensinger. Brisack began assisting Bensinger's efforts to organize a nearby Nissan Motor Co. plant and then, during breaks from their Rhodes scholarship in 2019, at a series of coffee shops in upstate New York.

The first Starbucks employee Brisack met with about gauging support for a union quickly got fired. After that, Brisack says, "I had a grudge." When they returned to the US from the UK in 2020, the upstate New York chapter of Workers United hired Brisack as its organizing director. That December, Starbucks, none the wiser, brought Brisack on as a barista. Their union office in Rochester sat mostly empty for the following year, the nameplate on the door reversed to hide their name. After a couple of months picking up shifts at Starbucks around Buffalo along with another salt, Brisack was confident that the stores could be organized and that the task would require more backup. The union recruited Starbucks salts through the Inside Organizer School, friends of friends and a cryptic online job posting for "Project Germinal," named for Emile Zola's novel about labor strife in French coal mines.

When applying for jobs at Starbucks, the salts would lay it on thick. "When she wasn't at work, my mother was running down Franklin Street in Syracuse to get a grande iced coffee, no sugar, and one-inch room for cream," Westlake wrote in his cover letter. "She taught me that the efficiency and quality that Starbucks offers is unlike any other cafe." (This was a half-truth, he says: "My mom hated Starbucks, but she did really love coffee.") He also told his interviewer that he would report any colleague he heard complaining about working conditions and that he hoped eventually to ascend to management. Another Starbucks salt, Arjae Rebmann, spent their job interview with their arms crossed or at their side, so the manager wouldn't notice the hammer-and-sickle tattoo on their left wrist.

With Covid raging, Brisack convened salt training sessions over Zoom, discussing how to get hired and how to make friends. Starbucks salts hosted brunches, gave thoughtful birthday gifts and boned up on their co-workers' favorite TV shows. Westlake says he changed his look partly to make it more obvious he wasn't a straight dude and to help his mostly female co-workers feel more comfortable around him. Another salt, Zachary Field, dug into astrology because it was popular with his fellow baristas. When he told them he was a Scorpio, more than one said that was weird—he didn't seem like the secretive type.

Field and Westlake lived in a group house with a couple more salts. That crew avoided hosting co-workers or even bringing home dates. Instead, some of them hung up pictures of Karl Marx and United Farm Workers co-founder Dolores Huerta, and the group used flashcards to quiz each other on Starbucks recipes and compared notes with other salts on which co-workers could be key to a successful union drive.

Westlake chose Gianna Reeve, a charismatic and sardonic Buffalo native. At 20, Reeve was a shift leader who commanded respect from baristas and bosses. She encouraged baristas to take bathroom breaks whenever they needed, and she wasn't shy about bad-mouthing corporate. In the summer of 2021, each salt broached the subject of organizing with a co-worker, asking them to meet up outside of work. Reeve says she thought Westlake might be asking her out on a date, but she'd been reading about the industry's labor unrest on Reddit and wasn't shocked when the subject of unions came up. Westlake told her he'd heard about the movement from someone who'd helped organize his last coffee shop, asking if he wanted to be involved in a new union campaign.

Reeve, whose dad was a United Auto Workers member, replied that she was all for the idea as long as it wouldn't get her fired. Westlake didn't tell her that he'd been dismissed from the first coffee chain where he led a union drive. He gave her tips on organizing more support, and she helped him figure out who else to ask. Other pairs at other cafes did the same, and by the end of August, Workers United had sent an open letter from 50 Buffalo-area employees to the company's CEO and begun filing for union elections at several shops.

Workers say Starbucks quickly dispatched extra managers to suss out union sympathizers and hold mandatory meetings warning that unionization could cost them their benefits. In November, it sent in Schultz, who'd retired, to win back wayward baristas. During a speech in the ballroom of Buffalo's downtown Hyatt Regency, he told several dozen staffers ▶

◀ about his upbringing in public housing in the Brooklyn borough of New York, his care for the extended Starbucks family and the perks the company had already delivered. Starbucks workers from across the country say this meeting also led to one of the most galvanizing moments for the organizing campaign, in which Reeve challenged Schultz to sign a pledge against union-busting and Schultz ducked out the back door instead. (A Starbucks spokesperson says Schultz visited to reconnect with employees and share the company's values.)

Unbeknown to Reeve, four salts had helped lead her to that moment. Westlake had recruited her. At the Hyatt, Brisack riled Reeve by describing how the management rep checking names at the door insisted on using the legal names for trans and nonbinary employees instead of their chosen ones. Another salt, Casey Moore, gave Reeve a copy of Workers United's anti-union-busting pledge and suggested confronting Schultz with it. As Schultz was wrapping up, Reeve turned to James Skretta, a salt seated next to her in the front row, and whispered, "Should I do this?" Skretta nodded and whispered back, "If you stand up, I'll stand up with you."

"I wouldn't have been able to do what I did without Jaz, without Casey, without Will, without James," Reeve says now. "They basically reset my life trajectory." She says she was unfazed to learn they were all undercover.

Brisack

During the confrontation, several executives awkwardly circled Reeve while Schultz exited and she declared, "The strength we have is our strength with each other." Video of the incident ricocheted around the internet, and employees who'd been avoiding engaging with the pro-union camp say it helped lead them to reconsider. A year and change later, staffers at 367 of Starbucks's roughly 9,000 corporate-run US locations have held elections, and 296 have voted to unionize. Reeve's cafe wasn't one of them, but in early March, a National Labor Relations Board (NLRB) judge ordered Starbucks to recognize and bargain with the union anyway, owing to what the judge called egregious violations of labor law during the election campaign. Starbucks is appealing the ruling.

Reeve has started attending the Inside Organizer School herself. On a panel at the workshop in March, she said the organizing campaign gave her a new sense of hope. Among the salts-in-training, she was a minor celebrity. Between singalongs to Lady Gaga and Rihanna at a nearby Irish pub, a former Tesla worker gushed that Reeve's showdown with Schultz was an inspiration. "It was badass of you to do that," she said. "I was scared shitless," Reeve replied. "It was just adrenaline." The next morning, during a session in which retail and flight attendant union organizers portrayed managers in a mock anti-union meeting, one barista texted another "LETS REENACT GIANNA," and they did.

From the start, these training camps have been designed both to attract prospective salts and to hone existing employees' organizing skills. The March session opened with an icebreaker: Participants introduced themselves by describing the most outrageous thing a boss had told them. The next couple of days included a presentation called "TikTok as Class Struggle," a role-playing session about raising the idea of a union with co-workers, a panel discussion about trans rights in the workplace and a closing presentation from Amazon salts in Canada. Presenters shared tips on documenting illegal threats from management and using divorce records to find out how much certain executives make. During breaks, participants did yoga, ate barbecue and joked about unionizing their dogs.

Several presentations made the case for the necessity of salting in the context of organizing's steep challenges. A Buffalo barista said she'd spent months loudly opposing unionization in part because she feared getting fired and believed she'd be promoted if she fought the campaign. Townsend, the training camp co-founder, looking Santa-esque in a red cap and suspenders, told the crowd, "Repeat after me: The workplace today is a dictatorship." During a session about cover letters and job interviews, Brisack emphasized the value of sounding like a snitch. They shared a list of screening questions they said were used by leading service industry companies, including "Do your emotions ever affect your work?" and "Would

PHOTOGRAPH BY MALIK RAINEY FOR BLOOMBERG BUSINESSWEEK you turn in an employee you caught stealing a candy bar?"

America's labor organizers have reason to be secretive. In the US, it's illegal to fire employees for trying to unionize, but the penalties are minor and can take years to litigate, so bosses have every incentive to do so. A former Starbucks store manager in Buffalo testified at a labor board hearing last year that higher-ups gave him a list of pro-union employees and told him to find ways to punish them. NLRB prosecutors have accused Starbucks of terminating more than 40 employees in retaliation for organizing. (The company denies this.)

Yet while salts rarely express regrets about misleading a boss, several say they wish they'd been more forthright once their union drives went public. "It was difficult," says Skretta, who invented a story about a significant other in med school to explain the recent move to Buffalo. "Exercising more trust in the leaders at an earlier stage wouldn't have been harmful."

More than a few workers have said they've felt burned after finding out their co-workers were salts. "It's very unsettling, because some of these people I thought were my friends," Buffalo-area Starbucks barista Hannah Scott told *Businessweek* last year. "It was very scheme-y." Another employee there, Taylor Shaw, said after learning about Brisack's prior work with Workers United that Brisack was just thinking of their union career and not the other baristas.

At Amazon, where salts were more open with co-workers about their roles in the union campaign on Staten Island, their intentions were thrown back in their faces more than once, according to one of them, Justine Medina. "There would be disagreements on tactical things," she says. And then would come the trump card: "You're just a salt." But hard work helped win over her peers. "I was unemployed, I needed a job, but I also wanted a union," she says. "As long as I work at Amazon, I'm an Amazon worker."

Salts say some amount of subterfuge is unavoidable while activists are vulnerable to retaliation. "I don't think we should be apologetic about it," says Brisack, who advocates fighting companies "by any means necessary" and is writing a book about the Starbucks campaign. Brisack says their biggest regret is that they haven't always been able to protect workers or to predict what Starbucks would do next. They mentioned Cassie Fleischer, one of the employees the NLRB alleges the company terminated illegally. "The one thing I do feel guilty about is that I told Cassie she wouldn't get fired," Brisack says. "I said, 'They're not going to do that.' And then, yeah, that was not true."

The Inside Organizer School remains a loosely organized confab, not some formal union body, but its leaders say they aim to start holding workshops every other month and to spread some of them across the country. "I don't think there's any company that you couldn't salt," says Brisack. Townsend says he sees potential in industries that employ a lot of downwardly mobile college graduates, like education and entertainment, as well as the service and technology industries, adding that he'd also like to see more recruits who, like him, never went to college. Activists have also been getting themselves hired at high-profile union shops where they hope to influence upcoming labor battles, including at United Parcel Service Inc., which is facing a potential strike this summer.

"This is the only cool thing I've done in my life"

To reduce the risk of hiring salts, companies might be screening job applicants more carefully. "It would be nice if a recruiter could ask, 'Are you now, or have you ever been, a union member?' " anti-union consultant Walter Orechwa wrote in a 2022 research note. "Unfortunately, that is not legal." He advised hiring managers to select candidates with exclusively positive feedback from past employers. His firm, IRI Consultants, has worked with Alphabet Inc. and, according to the California Nurses Association, the hospital affiliate of Stanford University.

Senator Tim Scott of South Carolina, a potential Republican presidential candidate, teamed with Representative Rick Allen of Georgia, another Republican, to introduce a bill last year that would make it easier to fire salts. The bill would legalize refusing work to anyone "who seeks or has sought employment with the employer in furtherance of other employment or membership in a labor organization." Its endorsers include the National Restaurant Association, the Retail Industry Leaders Association and the US Chamber of Commerce.

Even for many fierce union advocates, undercover work remains a tough sell, and some salts say the secrecy was lonely and draining. Many Starbucks salts and co-workers, however, say the undercover organizing changed them for the better. Reeve, who was planning to become a social worker after getting her psychology degree, now says she wants a career in organizing instead. Field, who's now a grad student studying water policy, says he'd salt again: "This is the only cool thing I've done in my life."

After Westlake's presentation on Saturday afternoon, a fortysomething man in blue jeans and a black hoodie told the salts-in-training about what it's been like to do the work on and off for years. He's worked the front desk and waited tables at hotels in California, sold bagels at a university in Washington, DC, cleaned toilets at a makeup factory in Pennsylvania and dried hospital sheets at an industrial laundry in New York. He tried to give up the life and teach middle school history but decided he preferred the undercover work.

"I wanted to change the world," said the man, who requested anonymity because he may salt again. "Am I a guy slamming my head against a brick wall? Or is that wall part of a prison we're all living in, and I'm breaking out? Maybe both." Ⓑ

SILICON VALLEY'S FAVORITE BAND

by Devin Leonard

Illustration by
Chris Burnett

April 10, 2023

IS DANCING THROUGH THE DOWNTURN

The Chainsmokers have had some flameouts in their VC side hustle. But it's too soon to write off the duo the critics love to hate

It had been one of those weeks for Drew Taggart and Alex Pall, more famously known as the Chainsmokers. On Thursday, the obstreperous dance pop duo played a club on a Greek island. On Friday, they were in London. Saturday, they jetted to Montreal for an afternoon show before racing off to their regular gig at the Wynn Las Vegas. Whatever stage they were on, there was probably also a fair amount of tequila swigging and jumping off the drum set.

Well, maybe not so much of the latter. "I'm doing less jumping," says Pall, who turned 37 last year.

"He used to do lots of jumping," says Taggart.

The Chainsmokers occupy a profitable but awkward niche in the music industry. Their songs—the biggest being 2016's *Closer*, a throbbing anthem about a tryst with an ex in the back seat of an SUV—have been streamed more than 8.8 billion times in the US alone, according to Luminate Data LLC, a music industry data provider. But such success hasn't necessarily brought the duo respect. As *Billboard* put it last year, Pall and Taggart are "two of the most ridiculed artists in mainstream music." The *New York Times* has called them "easily loathed." *Pitchfork* devoted two paragraphs in an early review to mocking the pair for lending their "full-throated support to the tech bro lifestyle" and their use of such Silicon Valley buzzwords as "iterating," "disrupting" and "return on investment."

More recently, the Chainsmokers have given their haters something else to hold against them: They've become venture capitalists, starting Mantis VC, a firm that raised a total of $110 million in the boom years of 2020 and 2021 from investors like TPG Inc. co-founder Jim Coulter and billionaire Mark Cuban. Cuban, in fact, can be seen in one of the duo's TikTok videos, in which Pall rips the T-shirt off Taggart's back during a performance and hands it to their benefactor to use as a napkin. "I've known them for a while," Cuban said in an email. "Like them."

In venture capital, as in music, a few hits can cover many misses. That's good, because as investors, the Chainsmokers haven't always been chart-toppers. Mantis VC put its money behind some of the same trends that have wreaked havoc on the rest of the venture capital class, which is reeling from the tech downturn and the recent collapse of Silicon Valley Bank.

Take the duo's crypto investments. Mantis bet on Terraform Labs Pte Ltd., a company that spectacularly imploded last spring, along with its stablecoin, TerraUSD. The collapse was one of the events that triggered the onset of the so-called crypto winter. The company's co-founder Do Kwon was arrested last month in Montenegro and faces criminal charges in the US and South Korea. He's denied any wrongdoing. (Mantis no longer mentions Terraform on its website.) The firm also put money into Sky Mavis, the maker of *Axie Infinity*, a crypto-based video game. At its peak in October 2021, Sky Mavis was valued at about $3 billion. It's since seen both its user count and the price of its nonfungible tokens crater.

NFTs have been a regular theme in the Chainsmokers' tech career. In December, Pall and Taggart were accused in a class-action suit along with Madonna, Snoop Dogg, Justin Bieber and other celebrities of publicly hyping up Bored Ape Yacht Club NFTs without disclosing they were being paid to do so. According to the complaint filed in federal court in Los Angeles, one of the project's orchestrators, Hollywood talent agent Guy Oseary, used crypto payments startup MoonPay—another Mantis portfolio company—to "obscure how he paid off his celebrity cohorts." The suit has been held up as illustrative of the need for more regulation in the industry. (MoonPay and the Bored Apes creators have denied the allegations. The Chainsmokers declined to comment as did a spokesperson for Madonna; the others didn't respond to requests for comment.)

Still, Pall and Taggart remain optimistic about crypto, saying through a spokesman that they hope the crash "rids the space of bad actors." They add that web3 bets make up a small percentage of the firm's overall portfolio, which also includes investments in fintech, gaming and other sectors that one might expect would attract two newbie millennial VCs.

And despite its companies' various scandals, it's far too early to declare the Chainsmokers' foray into VC a failure. Mantis has regularly joined industry stalwarts such as Coatue Management and Sequoia Capital in funding deals. It backed Coinbase Global Inc. before the crypto exchange's successful public listing. And it's invested in at least nine artificial intelligence companies, currently the tech industry's hottest sector. Its portfolio includes one of Silicon Valley's most sought-after startups, Stability AI Ltd., which popularized viral image generator Stable Diffusion. After achieving what's known in the business as "unicorn status" last October in a funding round valuing the company at $1 billion, Stability AI is in talks to raise another round that would quadruple that figure.

With a combination of surprising canniness and sheer survivorship, the Chainsmokers may yet ride out the tech downturn, just as they've ridden out the vicissitudes of the music industry. The Chainsmokers are not just a band with a business side hustle. They've managed their entire career with a kind of slide deck-ready gift for identifying how to achieve song-by-song market saturation in the streaming age. So far, they've lasted longer than many of their critics expected—and perhaps hoped. Last year, when the duo released its most recent album, *So Far So Good*, ads on New York taxis proclaimed, "Sorry, the Chainsmokers are back."

Pall and Taggart first met in New York in 2012 and bonded over their shared love of Scottish DJ Calvin Harris and specific brands of beer. They seemed like archetypal one-hit wonders in 2014 when they released a song on SoundCloud, *#Selfie*, that became a surprising smash. It's as inane as the title suggests, with a fingers-on-the-blackboard synth hook and lyrics concerning the quest of vacuous clubgoers to craft social media posts. It was a novelty tune that didn't reward repeated listens. The Chainsmokers have since disavowed the song, but it got them on *American Idol* and put them on the map.

The Chainsmokers followed *#Selfie* with a string of hits, starting the following year with *Roses*, which reached the top ranks of *Billboard*'s singles chart, and *Something Just Like* ▶

◀ *This*, which they released in 2017 in collaboration with Coldplay. Rather than putting out albums that might spawn hit singles, the duo churned out tunes on almost a monthly basis, rolling them up into compilations later. The idea was to achieve a constant presence on steaming services like Spotify. If you were a Chainsmokers fan, this was awesome. If not, too bad.

A surprising number of high-profile tech leaders dwell in the former camp. The Chainsmokers befriended the likes of Drew Houston, Dropbox Inc.'s chief executive officer, and Michael Seibel, a Y Combinator Inc. managing director, who urged them to chase their venture capitalist dreams. "Guys like this kind of encouraged us," Pall said in an interview at the pair's Hollywood Hills headquarters on a Tuesday afternoon in late July. The place isn't the whiskey bottle-strewn man cave you might expect, given their reputation as prodigious partyers. It's clean and sunlit—or, as Pall puts it, "vibey and nice"—with a drum set and piano nearby in case the Chainsmokers are inspired to record something.


Pall and Taggart

That afternoon, Pall, chatty and irreverent, wore an orange tennis shirt and olive sweatpants. Taggart, who's five years younger and more earnest, was clad in a gray T-shirt and gray slacks. Both sported beards and arm tattoos. Pall recalled the early conversations with some of their friends in the highest echelons of the tech industry. "They were like, 'You know, you guys are founders, too, and you built an amazing company,'" he said. "'There's a lot of value in that that you can provide.'" The Chainsmokers, shall we say, leaned in. They became angel investors in 2016, backing about 25 startups using their own money, the first being Ember Technologies Inc., which had come up with a self-heating coffee mug.

Their efforts caught the attention of Jeffrey Evans, an entrepreneur who'd started a record label and an artist management company, among other things, and Milan Koch, a blockchain specialist. Evans and Koch were already looking to link up with an influencer to form a venture firm. It was 2019, a bumper year for celebrity investing, but Evans and Koch didn't want just people with immense digital clout. They wanted people who would have gotten into venture anyway. That "eliminated 99.9% of the influencers in the world," Evans says.

The Chainsmokers were the 0.1%. They were already talking about setting up a firm. It was Taggart's idea; he'd started an investing club as a high school student in Maine. The hitmakers decided to go in with Evans and Koch. "We just really clicked with them," Taggart says.

Taggart and Pall announced the impending launch of Mantis in early 2020. Pall was so stoked he bought some suits so he'd look professional in investor meetings. Because of the pandemic, though, he never wore them. In retrospect, he muses, showing up as half of a tequila-chugging electro-pop band in conventional business attire could have been off brand. "It probably would have been weird," Pall concedes.

"Seriously," Taggart says. "I wouldn't have worn a suit."

As Covid-19 unfolded, Coulter, the TPG co-founder, told Pall and Taggart to "pump the brakes" and wait to see where the world was headed. "We were like, 'Well, that sucks,'" Pall recalls. But political leaders responded to the health crisis by pumping stimulus dollars into their dangerously beleaguered economies, global investors enthusiastically reopened their wallets, and Mantis soon had $35 million to play with.

Becalmed in Los Angeles because of lockdowns, Pall and Taggart spent their days on Zoom with founders of companies in which they might take stakes. At times they had to Google acronyms that the participants were

PHOTOS: (THIS PAGE) MILLER MOBLEY. PREVIOUS SPREAD: GETTY IMAGES (1) slinging, such as TAM, shorthand for the B-school idea of "total addressable market." They quickly figured it out. Consider how the term applies to one of their investments, a startup called Earth Funeral Group Inc.: "100% TAM," Taggart said last year on an episode of *Bankless*, a crypto podcast.

"Yeah, everybody dies," Pall said.

Music became something they did after hours. At night the Chainsmokers retreated to the studio to work on what would be their fourth album, *So Far So Good*. Their investing day job "probably helped us keep our sanity," Taggart says. "I can't imagine if all we were doing was music during the pandemic. I overthink all of our music anyway."

As the pandemic slackened and concert halls reopened, the Chainsmokers returned to their if-it's-Tuesday-this-must-be-Dubai lifestyle. In January the gossip site TMZ published a photo of Taggart holding hands with Selena Gomez, in a post proclaiming "Big Love in the Big Apple!!!" However, Pall and Taggart are still available to the founders of Mantis portfolio companies. Daniel Hanover, co-founder of Dandy, a dental technology startup, says they've hopped on the phone with candidates he wanted to hire and gotten them to come aboard. "This has happened probably half a dozen or a dozen times," he says.

Vinit Bharara, co-founder of Mojo, a startup that aspires to be a "sports stock market," enabling users to invest in professional athletes based on their performance, says he regularly pings the Chainsmokers for consultations. "We're talking about doing live events," Bharara says. "Obviously, they understand that really well."

Zhuoxun Yin, co-founder of Magic Eden, an NFT marketplace valued at $1.6 billion in June, says he's had similarly fruitful chats with the Chainsmokers, and not just virtually. "When we were in New York for NFT.NYC, I met them at Alex's place," Yin says on a conference call over Zoom.

"I didn't know you were at Alex's place," the company's director of marketing responds. "I'm, like, lowkey jealous."

Whether or not Mantis outlasts the tech downturn—the firm declines to comment on whether it plans to raise a third fund—it's helpful for the Chainsmokers to have a second act. *Pitchfork* called *So Far So Good* "easily their most enjoyable front-to-back listen" and bestowed it with it a 6.1 rating (out of 10), the highest ever for a Chainsmokers album. The record has the yet to yield a hit of the magnitude of *Closer*, or even of *#Selfie*, and the pair's attempt to use its release last May to capitalize on the NFT craze has had mixed results. At the time, Pall and Taggart gave away 5,000 NFTs to fans entitling holders collectively to 1% of the record's streaming royalties, deals on merchandise and a chance to rub shoulders with the two stars. Adam Alpert, the pair's manager, last year said that "if you're hearing that Alex and Drew went to a bar in New York with 10 token holders, that might make the value of the token go up, you know?"

Or not. The average sale price of these NFTs on Royal, a digital music startup and NFT marketplace, rose to $386 last June before falling to $49 in early April. Yet as far as the Chainsmokers are concerned, the NFT drop has gone just fine. They recently met up with holders of five or more tokens in Minneapolis. "The fans were so appreciative," they said through their spokesman. (The Chainsmokers, it's worth noting, are entitled to a 7.5% cut of secondary sales of the tokens, but they plan to donate that money to the album's songwriters, whose profession they say is underpaid in the music business.)

"THEY'RE REALLY STAYING IN THE CONVERSATION, POSSIBLY AGAINST OUR WILL"

Whether or not they make—or lose—a lot of money, side hustles like venture capital and NFT drops have kept fans and haters talking about Pall and Taggart. "They're really staying in the conversation, possibly against our will," says Anna Gaca, a senior editor at *Pitchfork*.

The Chainsmokers were once again the center of attention last summer, when they signed on to play a gig in space next year. Or, as the Associated Press explained when it broke the story, performing in a "pressured capsule tethered to a stratospheric balloon…some 20 miles above the Earth."

"My girlfriend's not going to believe me when I tell her," Pall says.

Taggart reminds him that they have a gig the next day at a casino. "We're going to have to come down really quickly," he says. "Hopefully, we can land it in Vegas." Ⓑ —*With Hannah Miller*

IN FULL BLOOM

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THE WATCH SPECIAL

The Lady Arpels Heures Florales Cerisier tells the hour by opening the corresponding number of flowers to reveal the gemstones inside

Van Cleef & Arpels is making big strides in the world of elite timepieces

By Andy Hoffman

Photograph by Hannah Whitaker

APRIL 10, 2023

EDITED BY CHRIS ROVZAR

BUSINESSWEEK.COM

A Planétarium automaton with semiprecious stones representing planets and a diamond-studded sun

As the global watch press descended on Geneva a year ago for the first in-person Watches and Wonders since the start of the pandemic, it was a timepiece and a mechanical objet d'art from Van Cleef & Arpels that made indelible impressions on many attendees—despite the inevitable buzz around the latest unveilings from Rolex and Patek Philippe SA.

The Lady Arpels Heures Florales features mechanical flowers, set with diamonds and sapphires, that open and close to show the time. In a nod to floral rhythms, the watch was inspired by the Swedish botanist Carl Linnaeus's vision from 1748—never realized—for a garden of flowering plants that would tell time accurately by opening and closing for specific portions of the day.

Offered in pink or blue, the Heures Florales has a rose or white gold case, a mother-of-pearl dial and a price tag of $256,000. "It's a milestone," says Rainer Bernard, the head of research and development at Van Cleef & Arpels Ltd. (VCA). "It goes beyond what we had done so far with the indication of time, and it is perfectly within the DNA of the maison."

The watch is exceedingly complicated, with about 226 components on the dial and an additional 533 in the mechanism, which is made in the ValFleurier manufacture of its parent company, the Swiss luxury conglomerate Richemont. "Technique should always be there to help the beauty of the piece and not in the foreground," Bernard says.

In fact, the Heures Florales made such an impact that judges at the Grand Prix d'Horlogerie de Genève, often called the watch industry Oscars, awarded it the 2022 innovation prize. And as the global timepiece industry descended once again on Geneva for Watches and Wonders at the end of March, VCA was on the tip of many tongues.

Better known for its jewelry creations, VCA has been making watches since its founding in 1906. It can't boast a truly iconic watch design (yet) like the Tank from Cartier, the larger French jewelry maison also owned by Richemont. But VCA is cutting its own path, offering not only elegance and artisanal precious-material finishings but also innovative and surprising haute horology.

The Lovers' Bridge watch

And VCA's overall sales are fluttering upward, like the fairies found on so many of its pieces. They rose to about €2.3 billion ($2.5 billion) in 2022, having doubled since 2018, with watches accounting for about 10% of revenue, according to Swiss bank Vontobel Holding AG. "The brand is highly profitable and has performed extremely well thanks, in part, to great pricing power," says Vontobel analyst Jean-Philippe Bertschy.

Most in the luxury world will know VCA best for its Alhambra line of necklaces and bracelets, with their beaded gold trim—including the one often seen on NBA legend LeBron James's wrist. That's a pity, says Bertschy. "Although their watches are seen as 'jewelry watches,' I believe that they offer much more in terms of quality," he says. Alhambra also includes timepieces, which aren't as famous as the bracelets. Other signature collections include newer Perlée offerings and various types of "secret" watches, such as a new Ludo edition that allows the wearer to hide the time-telling so the piece looks like simple jewelry.

According to estimates by Morgan Stanley and LuxeConsult, VCA makes about 13,000 watches a year with sales of about 521 million Swiss francs ($571 million). That puts the watchmaking division in the top 20 of Swiss brands by revenue—bigger than Blancpain, Bulgari and Breguet but smaller than Omega and Cartier, which each make about 600,000 timepieces a year.

"This is the other brand making serious money in Richemont's portfolio [besides Cartier]," says Oliver Müller, an industry analyst and consultant who heads LuxeConsult in Switzerland. "They have a very strong product signature with the different product families. And they do an extraordinary job with the watches and the poetic complications."

COURTESY VAN CLEEF & ARPELS

It's these "poetic complications," or special functions within the mechanical movement of the timepiece, that Van Cleef uses most effectively to tell stories on a dial. Perhaps its most famous such creation is the Pont des Amoureux, or Lovers' Bridge.

The Lady Féerie Or Rose watch

Developed with the vaunted Swiss specialist Agenhor SA in 2010, the Lovers' Bridge utilizes what's called a retrograde movement that tells time by moving an indicator along a line while pointing to hour and minute indexes before snapping it back to the beginning when a complete cycle of 60 minutes or 12 hours has passed.

The hand-painted enamel dial features a pair of paramours on a bridge in Paris. The woman figure on the left of the dial holds a parasol that points to the hour, while the gentleman holds a flower pointing to the minute. As time progresses, the lovers move closer together before finally sharing a kiss at midnight.

The Floraison du Nénuphar automaton, which opens to reveal a butterfly that rises and flaps its wings

It's a tale of anticipated romance expressed with mechanical gears. And it doesn't come cheap. Prices range from 126,000 francs for the men's version housed in a white gold case to as much as 402,000 francs for a woman's model encrusted with diamonds and sapphires on the gold case and bracelet. (Entry-level Perlée watches start at $8,500—but go on the VCA website, and you won't see many of those.)

"We really try to take one step back and say, 'OK, what are the stories that we want to tell? What is the meaning of time? How was it measured?' " says Nicolas Bos, the company's president and chief executive officer.

VCA's horological responses to Bos's queries have forced the wider watch world to take notice. At last year's Grand Prix, the Heures Florales's win was actually the second of the night for the maison. The other had its origins in a jumbled second-floor workshop in the town of Sainte-Croix on the Swiss side of the Jura Mountains. It's a creation of François Junod, one of the world's greatest makers of automatons—mechanically driven objects that can resemble natural floral and fauna. The Fontaine aux Oiseaux automaton was not only a one-of-a-kind marvel and showstopper, it also won the mechanical clock prize.

Powered by key-wound, spring-driven and mechanical gears, the bird fountain is a stunning thing to behold when it's in motion. It features gem-set lily pads opening to reveal gilded treasures as diamond- and sapphire-encrusted birds chirp and step gingerly in shimmering waves. Bos wouldn't say exactly what the bird fountain sold for, only that it garnered "several million dollars" from a collector.

VCA unveiled another series of automatons at Watches and Wonders this year, as well as several new watch models. They're all variations on the maison's well-defined thematic oeuvre—nature, flowers, butterflies, fairies, astronomy and dance. The new automaton clocks the master Junod has produced include a tabletop piece, Floraison du Nénuphar, featuring a precious-metal flower opening to reveal a bejeweled butterfly that rises and flaps its wings.

The company's latest Poetic Complications watch is the Lady Féerie Or Rose (aka the Lady Fairy Rose Gold), which, like the Lovers' Bridge, incorporates a retrograde minute hand, indicated by the gem-set fairy's wand, as well as a windowed jumping hour indicator resembling the setting sun. The 33-millimeter watch showcases VCA's enamel dial prowess with soft gradient hues all created by hand at the company's manufacture in the Meyrin area of Geneva, as part of a campus of Richemont-owned brands.

Bos says the watch unit of VCA's business has been growing at a similar pace as its better-known jewelry divisions. All of the company's jewelry and watches are only available at VCA boutiques, including a new third location opening soon in Manhattan amid increased demand in the US.

"It's not a side project, it's a proper activity," Bos says of the Van Cleef & Arpels watch brand. "We have teams, we do apprenticeships, we train people, and we develop projects for the long run. We are fully committed." Ⓑ

The Eveil du Cyclamen automaton

REAL TALK WITH PATEK PHILIPPE'S THIERRY STERN

What comes next for the watchmaking industry, and what happens after the Nautilus?

By Chris Rovzar and Andy Hoffman

At the Watches and Wonders trade fair in Geneva, the head of the family-owned Swiss watchmaking juggernaut Patek Philippe SA sat down with Bloomberg on March 29 to discuss the future of the watch market, succession plans and a new watch he'll soon be bringing to market. Here is the conversation with Stern, 52, edited for length and clarity.

Patek is very sheltered from the crosswinds in the broader market. Do you see the boom the industry has experienced over the past three to five years continuing, or do you see it softening?

The boom is maybe at its peak for now—this is my own guess. There will be two factors: The first one is the secondhand business, where prices were really way too high. This is now coming back to normal. The second one is that for two months now, the market is a little bit slower than before. I think that the business is very good, but I don't think it will be as successful as the other years. The [current customer] wait time is also so big that it's not so bad if we see a certain slowdown.

Are you raising your production numbers?

No, not at all. I'm fighting to maintain it now at 70,000 pieces. We don't have the capacity to overproduce at Patek. If it's only a simple quartz movement, yes, I could produce 5,000 more. But that's not what people are wanting from us, and that's also not what I am willing to do.

This is also why we decided to reduce by 30% the whole network [of retailers]. As I couldn't increase the production, my only other choice was to reduce the points of sale, so everybody could get a little bit more watches.

It's not something easy to do, from the human side of it. Businesswise, it's easy: You send the letters, and you're out. With Patek, it's a family business. You have to face people who have been working with us for many years. And yet I have no choice—I have to preserve the other stores and to give them more quantity. The stores are empty. This is not a good sign.

So, are you going to open your own points of sale?

No, no. The target for Patek is not to have its own distribution. I'm very happy with the financial side of Patek Philippe. I'm the only shareholder, so it's not a matter of having somebody on my back pushing me to make more money. What is more important is to keep the credibility of the brand. And my most important task is also to prepare the next generation to take over.

We also have to preserve our collectors. For them, the most important thing is, are you going to sell Patek Philippe, or are you going to keep it? Because some of them spend so much money on their watches, and they're very afraid that suddenly I will sell [the company], and then the value will just drop.

If I'm selling to a group, for sure I will be myself the winner. I can sell it for billions. But then I'm going to kill Patek Philippe in less than five years. You can be sure you will only see Nautilus, because that's what the group would do. This is not what I want to do.

COURTESY COMPANY

So that's a "no" to a sale of the company. OK. What about bringing a certified preowned business in-house?
Well, I'm not willing to do it, because I'm already fixing every watch [we've made] since 1839. It's not really rare for me to see a 100-year-old watch coming back. So the after-service that I have is kind of like a preowned business. But I am a watchmaker—I'm selling new watches. That's what I'm good at.

"SOMETHING QUITE HUGE FOR COLLECTORS...WILL COME THIS YEAR"

How about moving the brand past the Nautilus, which was so popular that you discontinued it. How do you move your clientele on to new things? Will there be new watches?
You have to be creative and find a very attractive watch. To do that, you need great expertise. I've known the business for over 30 years. I also have been traveling all over the world, working with retailers, distributors, final clients. And most important, I also know how to fabricate [watches], because that's how I started at Patek. And today that allows me really to think about new ideas in term of design, in term of new movements.

I don't want to become—it's a good example—like AP [Audemars Piguet] with the Royal Oak. Very nice watch, but the problem? They only have the one. If the trade says, we have enough of them, everybody wears it. *Attractivité* will go down; AP is dead.

After 30 years, you'll also know how to create a very attractive new price-point watch. Because the price is important. You should not only do a million-dollar watch—we don't have only very, very rich people. We have people who are passionate about watches and who can spend a maximum of $30,000 or $40,000 on a watch, which is already a lot of money.

Are you striving to create another icon like the Nautilus?
Well, yes, because it's always fun to create an icon. But it's easy to say, really difficult to realize. To create a new line of products—that's really the challenge.

I'm preparing something, yes. And it's something you will not see every year. A new line of product can only appear maybe every 5 to 10 years. You know, the last one we had, the Twenty~4 line [which made its debut in 1999], worked very well for the ladies. The Aquanaut is also a very beautiful line.

And the next one should come quite soon. I'm preparing it. Design is done, prototype is ready. And, really, I like it. Not a lot of people have seen it, maybe 500 people internally at Patek. And we now have to be ready in terms of production. I cannot tell you exactly when, because we're just now discussing that. Something quite huge for collectors, really those passionate about the brand, will come this year.

Are we talking months or years?
Months. I expect it'll be either this year or next year. Everything has to be perfect. This is why it takes very long at Patek to create a new movement, because we want to be sure that it works. It's a bit like a plane engine, you know? You cannot have a new [line of] plane engines and say, "Which will work? Well, if this one crashes, we'll see how to improve." It doesn't work like that.

Are there any updates on the succession or how the management will evolve?
All this is already organized. [CEO Claude] Peny will retire. And we have a new general manager, who is Mr. Laurent Bernasconi. This person has been with Patek 19 years. He's humble, down-to-earth. He has respect, not only for the product, but also for the family. And he's brilliant. So for me, it's very reassuring. And my sons, who are 20 and 21, both of them are willing to work for Patek. You know, I didn't push my sons to come. You cannot do that. We talked to them when they were about 15 and 16 years old, and we said, "You are not obliged to take over the family business." We said, "Listen, we had you because of love, not at all because of Patek."

And now both of them made the choice on their own. They will start their training next year. So if I can retire when I will be—what, 65 or 70—I will be happy, you know?

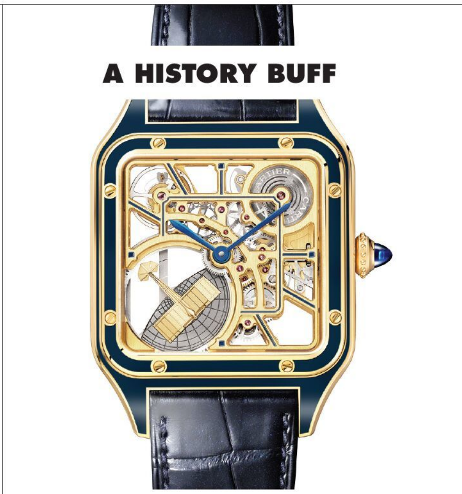
How much attention do you pay to the secondary market, the kind of pieces they're interested in?
With the internet, you can directly spot, OK, this piece is hot, this piece is less hot. Truthfully, I know it before that, because I know it from my own clients.

What I'm doing, actually, when it's a new model, is asking, "How come this one that I just started selling a few months ago is already in the secondary market?" That means that one of the retailers, including our own store in Geneva, has sold the piece to the wrong person. Someone who [flipped] it.

I'm buying those pieces back. Not all of them—there are too many. But we are buying a couple hundred pieces to check that. And then when I have it, I check the number. This number allows me to know that, OK, I sold it to Patek Philippe Rue du Rhône, so go to Rue du Rhône and ask my store manager, "Explain this to me. This watch, I bought it on the secondary market. To whom did you sell this watch?"

That's interesting!
And you know, the retailer sometimes didn't do anything bad. He says, "But I sold it to this gentleman. I never had a problem with him." He can be also tricked, you know? But sometimes, no. And if I see that this retailer doesn't play the game well—are you ready to lose Patek as a partner [to make money on] just one or two watches? OK, then we will close you. B

Tudor Black Bay 54
Smaller watches are becoming all the rage, after years of hefty steel chonkers hogging the spotlight. One of the most elegant executions we saw was Tudor's unisex Black Bay 54. The domed sapphire crystal, golden color flourishes and 37mm size give it a mature, vintage-cool feel. *$3,850*



Cartier Santos-Dumont Skeleton
The French maison continues to dive into its history with early aviator Alberto Santos-Dumont. Here, the *Demoiselle*, an aircraft designed by the pilot, appears on a micro-rotor on the skeletonized dial. Combined with the blue lacquer accents, it's a soaring feat of design. *$41,600, limited to 150 pieces*

Piaget Sautoir
This style of pendant watch looks modern, but it's been around for more than 100 years. Each link on the chain is worked by hand from a single gold wire, taking about 130 hours to build. It'll ensure the wearer stands out at any event—and always knows when it's time to hop to the next. *$193,000*

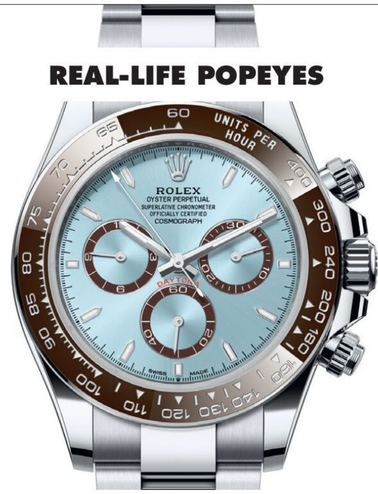
A WRIST-SPOTTING GUIDE FOR THE YEAR'S BEST NEW WATCHES

Vacheron Constantin Overseas Moon Phase Retrograde Date
The arc of the date counter at the top of the electric-blue dial and the celestial complication combine to turn this 41mm steel Overseas from a fairly traditional sports watch for folks on the finance desk into something more attention-grabbing. *€48,000 ($52,000)*

Jaeger-LeCoultre Reverso Tribute Chronograph
This year Jaeger-LeCoultre went all-in on models in the Reverso line, a brand signature wherein a first watch face can be flipped over to reveal a second. Here, a dramatic open-face chronograph dial hides on the reverse of a standard time-only one. *$37,400*

Patek Philippe Calatrava 24-Hour Travel Time
An exquisite way to embrace a continental-time mindset, this 24-hour design features 44 numerals and indicators, each hand-filled with luminescent material. Especially in person, it's stunning; the segmented dial is a real head-turner. *$48,500*

COURTESY COMPANIES



Rolex Platinum Daytona
In honor of the model's 60th anniversary, Rolex redesigned its Daytona line of chronographs. The highest-end version in 2023 is a heavy platinum edition with a chocolate bezel, sapphire caseback and ice-blue dial. Wearing it is a workout, just to lift your wrist. *$77,800*

Grand Seiko Tentagraph
Japan's Grand Seiko is so serious about accurate timekeeping, the brand has never done a mechanical chronograph—until now. The high-density titanium Tentagraph (here in a lovely blue) brings together high-beat precision and three days of reserve power. *$13,700*

Chanel J12 Cybernetic
This two-tone watch looks just as cool in person as it does in pictures. The black ceramic-and-steel case, which bleeds into a white ceramic pixelated pattern, houses a self-winding mechanical movement, so it may just outlast your investments in NFTs. *$13,900*

A total of 49 leading brands exhibited at this year's Watches and Wonders expo in Geneva, with more companies crammed into hotel suites and lobbies throughout the Swiss city. It's a lot of timepieces to take in, but here are the most interesting debuts, along with who you're most likely to see wearing one. *By Chris Rovzar*

A. Lange & Söhne Odysseus Chronograph
It took the German masters of complication six years to develop this first self-winding chronograph. After you've timed something and go to reset the chrono, the red seconds counter does a neat trick: It speedily rewinds back to start by as many turns as it recorded. *Price to be determined*

Oris ProPilot X Kermit Edition
In an enviable partnership with the actual Muppets, Oris created a titanium watch with a vibrant lime-green dial and a cute surprise: At 6 o'clock, in the little rectangular indicator where you might expect to see the date, you'll find Kermit the Frog's smiling face instead. *$4,600*

IWC Ingenieur Automatic 40
The legendary Gerald Genta designed IWC's long-discontinued Ingenieur in 1976—the same year he did Patek's Nautilus. This new-old model fits three current industry fads: steel sports watches with integrated bracelets, historic reissues and vibrant dials. *CHF 12,000 ($13,100)*

BORN OF FAMILY AND FRIENDS

In five years, Norqain has used industry connections and know-how to become a sports watch wonder

By Andy Hoffman

When Ben Küffer started Norqain SA in 2018, he knew it wouldn't be an easy sell. "We did it when nobody wanted another watch brand," says the 35-year-old chief executive officer. His family is Norqain's majority shareholder.

At the time, the industry was just recovering from a multiyear decline. In 2017 the chairman of watchmaking giant Richemont, Johann Rupert, lamented that retailers were being "force-fed" timepieces wholesale "like geese producing foie gras" and that stores were choking on the volume.

"We didn't listen, we just did it," Küffer says. With the backing of his parents and a childhood friend, he put the pieces together to begin a line of rugged sports watches with streamlined designs and Swiss-made movements.

The Wild One

Five years on, plenty of people want a Norqain. The company produced about 10,000 watches in 2022 and enjoyed its best sales year yet, with revenue surging 117% from 2021. The watches are available in more than 180 retail locations as well as Norqain boutiques in Singapore and Zermatt, Switzerland, with New York City and Zurich stores in the works.

Right from the get-go, "Norqain was bang on trend with a solid family of steel sports watches aimed at new and young converts" to mechanical timepieces, says Rob Corder, editor and co-founder of the trade publication *WatchPro*. Priced at a range of 2,000 Swiss francs ($2,175) to a little more than 6,000 francs, the watches fill a market gap in entry-level luxury as brands such as Omega move further upscale.

Many of its offerings are subdued and traditional, but the brand's Independence line is where Norqain's watchmakers showcase their mettle. The most exciting of these timepieces, the Wild One, was released in 2022 after being developed in collaboration with Swiss watch industry legend Jean-Claude Biver, the former head of watches at LVMH Moët Hennessy Louis Vuitton SE, where he made Hublot a top seller.

Biver agreed to help the fledgling company in the darkest days of the pandemic; Norqain's revenue had dropped from about 4 million francs in its first year of business to a low of 22,000 francs in April 2020. He became an official adviser to its board of directors in June 2022 and later an investor.

Küffer says the veteran executive pushed the young brand to create a timepiece that was unique and original enough to differentiate it from the usual Swiss offerings. The result: a featherweight watch housed in a proprietary carbon-fiber case (the brand calls its version of the material Nortec) with a shock-resisting system that makes it well-suited to mountain biking, skiing or trail running. Priced at around 6,000 francs, the Wild One is six times lighter than similar watches made of steel and three and a half times lighter than those made of titanium, thanks to the Nortec. Swiss manufacturer Kenissi SA, which also supplies to Tudor and Breitling, produces its NN20 movement.

WatchPro's Corder says Norqain's fast ascent to selling 10,000 watches a year is notable; it took English brand Bremont 20 years to reach the same milestone. The company's financial backing and connections to the Swiss watchmaking industry have been key, he says.

Küffer's father, Marc, was once the CEO and owner of white-label Swiss watch manufacturer Roventa Henex SA and now chairs Norqain's board; those ties led to a special setup in which Norqain watches are produced at Roventa Henex facilities in Switzerland. The younger Küffer worked for Breitling AG for 11 years as the brand manager in Switzerland and Asia; his former colleague and childhood friend Ted Schneider, whose family owned Breitling before selling in 2017, now sits on the Norqain board.

"I said, 'I can't let him do this alone,' " recalls Schneider, the director of business development at Swissroc Group, a Geneva-based real estate services firm.

Küffer says Norqain is now in the black and recently conducted a successful capital increase with shareholders. Although the early hurdle of starting a Swiss brand and boosting sales to a respectable level has been passed (it helps that the industry has boomed extraordinarily since Norqain was launched), challenges lie ahead. The brand wants to expand to regions beyond its core markets in the US, Japan and Switzerland and try to keep pricing at the entry level of the market for most models, even as inflation puts pressure on its costs.

And yet, Norqain's plans are mapped beyond 2025. "When you start a company with your friends, there's a real pressure," Küffer says. "But we always knew we'd do it together." B

COURTESY COMPANY

LUXURY, AHOY

Wempe and a superyacht designer bring the marine chronometer ashore.
By Matthew Kronsberg
Photograph by Hugo Yu

In the days before GPS, the accuracy of a ship's chronometer might be a matter of life and death. Navigators used them to determine longitude by measuring the local time via a sextant and a star map, then comparing it against the time at one's home port precisely tracked by the clock. For more than 85 years, Wempe's products have remained ruthlessly reliable, even if today's consumer creations from the Hamburg-based watchmaker are more likely to adorn the offices of captains of industry than bridges of ships. A collaboration with superyacht designer Tim Heywood, the $91,825 Coco de Mer marine chronometer, comes in gold-plated brass on a lockable gimbal, all housed in a box meant to evoke a *Lodoicea maldivica* coconut, known for its ability to float long distances unscathed.

THE COMPETITION

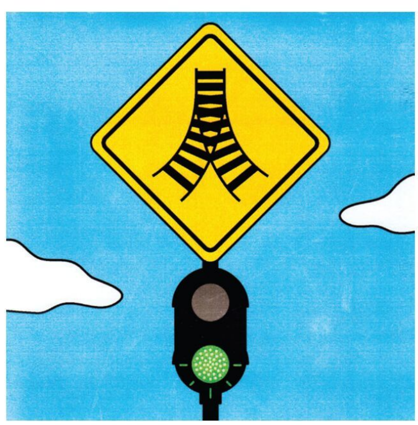
• Other table clocks that channel the spirit of travel include Jacob & Co.'s $120,000 Astronomia. A spinning blue-lacquered Earth, tourbillon, time display and actual meteorite fragment conjure a cosmic voyage as they rotate like satellites around an aventurine dial.
• Skip the bridge—Louis Vuitton's $5,750 Trunk table clock is made for the captain's suite. An 80-millimeter dual-time GMT clock comes in its own monogram case, and colorful flags on the dial lend it vintage nautical flair.
• The 39,375 Swiss franc ($43,000) Time Fast II from L'Epée 1839 might look like a toy, but the race-car body and chassis pay homage to 1960s speedsters in meticulous detail, from the compound rubber tires to an ignition key that turns on the V-8 engine pistons. Twin movements power the clock and automaton feature. To wind, just pull the car back.

THE CASE

Although the marine chronometer may be as anachronistic as celestial navigation, it isn't obsolete—many ships still keep a backup clock on board. Even in the face of roiling seas, Wempe's three-bridge movement and chain-and-fusee assembly, housed behind a single piece of borosilicate glass, keep rate variation to a maximum 0.3 seconds per day. On the 101mm deep-blue face, a subdial at 12 o'clock tracks the remaining 56-hour power reserve, essential because a stopped clock could lead to a lost ship. Here, though, the only real risk of tragedy would be keeping Heywood's callipygian Coco de Mer case closed away from admiring view. *$91,825; limited to an edition of 50; wempe.com*

Not All Big Mergers Are Treated Equally

By Brooke Sutherland



The North American railroad industry is headed for its first major consolidation since the 1990s after the US Surface Transportation Board on March 15 gave the green light to Canadian Pacific Railway Ltd.'s $31 billion merger with Kansas City Southern. These are the sixth- and seventh-largest railroads in North America by revenue, respectively, and the combined entity will still be the smallest of the major carriers.

A week before, the departments of Justice and Transportation launched an effort to block JetBlue Airways Corp.'s $7.6 billion acquisition of Spirit Airlines Inc. on the grounds that it would lead to higher prices and reduced competition. JetBlue and Spirit are the sixth- and seventh-largest US airlines by revenue, respectively. The combined entity would still lag the sales power of the four biggest US airlines. Sound familiar?

Some arguments made by the STB—an independent federal agency—in favor of the railroad tie-up are reminiscent of those JetBlue Chief Executive Officer Robin Hayes has made in advocating for the Spirit takeover.

The airline and railroad industries are heavily consolidated and capital-intensive. So the only way to get meaningful competition is to allow the smallest of the bunch to combine—or so the theory goes. The railroad merger will create a single-line service spanning North America, "which in turn will enable the new CPKC system to better compete for traffic with the other larger Class I carriers," the STB said. In a February interview with Bloomberg News, Hayes said: "You either accept a world where you have four large airlines who will call the shots…or you can create a true low-fare, high-quality national challenger to take on these guys."

President Joe Biden issued an executive order in July 2021 calling on agencies across the US government to curb abuses of power in consolidated industries, but big deals are still getting done. The two largest jet lessors—AerCap Holdings NV and General Electric Co.'s Capital Aviation Services unit—merged in 2021. S&P Global Inc. and IHS Markit Ltd. were allowed to create a financial data goliath last year.

Yet Lockheed Martin Corp.'s takeover of Aerojet Rocketdyne Holdings Inc. and Nvidia Corp.'s pursuit of chip designer Arm Ltd. faltered amid regulatory scrutiny. Regulators don't have unlimited time and resources, so it makes sense they would focus on combinations in controversial industries involving well-known companies.

Railroads were a relatively staid sector until a February derailment of a Norfolk Southern Corp. train carrying toxic chemicals thrust the industry's safety record into the spotlight. Even so, the STB said the merger would not have a significant impact on the risk of hazardous material spills and the overall rate of railroad incidents should remain low. The railroad combination is expected to shift 64,000 truckloads annually away from roads, where the accident rate is much higher, the STB said. ⓑ —*Sutherland is a columnist for Bloomberg Opinion*

ILLUSTRATION BY GEORGE WYLESOL

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