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Bloomberg Businessweek

June 3, 2024

Fixing Pixar

How the famed animation studio is getting past its duds and missteps 36


GAGGENAU
FOR THOSE WHO KNOW
18:18
GAGGENAU
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The difference is Gaggenau

Bloomberg Businessweek

June 3, 2024

◀ Pixar's campus in Emeryville, California

FEATURES

PHOTOGRAPH BY CAYCE CLIFFORD FOR BLOOMBERG BUSINESSWEEK

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■ COVER TRAIL

How the cover gets made

❶

"This week's story is all about Pixar!"

"Incredible!"

"Yes. Nice to have something fun for a change."

"It's good for the soul."

"I see what you're doing."

"What can I say? I'm a fan, inside out."

"Well, Pixar's other fans haven't been as enthusiastic lately. The company is hoping *Inside Out 2* will turn things around."

"What's this one about?"

"A teenage girl, plus Joy, Anger, Fear, Disgust and Sadness."

"Reminds me of making a news magazine."

"Really?"

"You start every publishing cycle with the fear of failure. Disgust with your own ideas. White-hot anger over some late change. Joy when it finally comes out. And then sadness that it's over."

"The bittersweet world of the media industry."

Cover: Illustration by Sean Dong

TECHNOLOGY: PHOTOGRAPH BY DINA LITOVSKY FOR BLOOMBERG BUSINESSWEEK

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IN BRIEF

● Samuel Alito dismissed calls from lawmakers to

recuse himself from Supreme Court cases involving Donald Trump and the Jan. 6 riot following revelations that flags associated with far-right causes flew outside two of his homes. The justice blamed his wife, Martha-Ann Alito, for the flags, saying, “She makes her own decisions, and I honor her right to do so.”

● War in the Middle East

► Israeli forces reached the center of Rafah in southern Gaza on May 28. Israel says it believes thousands of Hamas fighters and leaders are based there, along with some of the hostages the terrorist group captured on Oct. 7.

► The move on Rafah has drawn international outrage, with the UN saying 1 million civilians, most of whom had fled other parts of Gaza, have left the city. The Biden administration says Israel’s actions there have not crossed a “red line” that would lead it to freeze arms shipments to the country.

► Israel National Security Advisor Tzachi Hanegbi says it likely won’t be able to defeat Hamas before yearend.

● Survivors search the site of an Israeli strike on a refugee camp on May 27. Israel says the strike, which killed at least 45 people near Rafah on May 26, was a mistake.

● ConocoPhillips will buy Marathon Oil in an all-stock deal valuing it at about

$17b

The move will expand ConocoPhillips’ global reserves and vastly increase its footprint in US shale fields. The deal adds to a spate of recent megadeals, as producers who think oil and gas demand will remain hardy for years to come seek new drilling sites.

● Six of the 10 biggest US EV makers saw year-over-year sales growth of more than 50% in the first quarter. Ford, which cut capacity and curbed hiring plans at its Michigan battery plant in November, registered a scorching 86% increase in EV sales.

● Merck purchased Eyebiotech, which makes Restoret, an early-stage experimental antibody aimed at macular degeneration and other diseases, for as much as

$3b

And Johnson & Johnson will pay Numab Therapeutics

$1.25b

for the rights to an experimental eczema treatment.

● Rwanda sent 2,000 more soldiers into Mozambique.

Those troops join 2,500 who were sent in 2021 to dislodge a band of Islamic State soldiers in Cabo Delgado province. IS has ratcheted up its attacks this year, further delaying a pair of multibillion-dollar LNG export projects planned by TotalEnergies and Exxon Mobil.

● “Nobody is useless, nobody is superfluous, there’s space for everyone as we are.”

Pope Francis, apologizing for using an Italian slur to describe LGBTQ people in a conversation with bishops about allowing gay men into seminaries, reiterated his relatively progressive attitude that there is “space for everyone in the Church, for everyone!”

● China’s National Integrated Circuit Industry Investment Fund has designated

$47.5b

to develop a standalone chip supply chain that can withstand US trade curbs. China currently has no access to the top-notch silicon, such as Nvidia’s H100 GPU, it will need to build AI-capable semiconductors.

● The FDA on May 28 approved a supplement from Elanco Animal Health that reduces methane emissions in dairy cattle 30%, on average. Bovaer, added to cattle feed, suppresses an enzyme that generates methane. The UN Food and Agriculture Organization says livestock produce 14.5% of all human-induced greenhouse gas emissions.

Greenwashing's End Is Within Sight

By Michael R. Bloomberg

The problem of climate change can't be solved without capitalism. Governments have tried for more than three decades with little to show for it. Although more of them are now engaging partners in the private sector, the world still lags in deploying the full power of the market. A recent announcement by the Biden administration can help to change that, by beginning a much-needed overhaul of the market for carbon credits.

Global investment in clean energy has accelerated but is far below what's required to restrain rising temperatures. Governments won't make up that difference on their own. Much of the capital will need to come from the private sector. Businesses and investors are eager to provide it, but in one crucial area—carbon credits—a market failure is keeping them on the sidelines.

Carbon credits offer companies and investors many ways to reduce greenhouse-gas emissions. In addition to helping finance new clean-energy installations, these credits can drive capital toward projects with high upfront costs but high potential rewards. The possible demand for carbon credits is great. Many business leaders recognize that the costs of inaction are enormous—and that tackling climate change is in their companies' self-interest—and so they are setting ambitious decarbonization goals. That isn't altruism. It's capitalism.

Companies have far less control, however, of their so-called Scope 3 emissions, those generated by suppliers and customers. Allowing companies to purchase credits against these emissions—but only after they disclose and begin implementing robust plans aligned with the Paris Agreement—could drastically increase the demand for them.

For the demand side of the market to function, however, the problems on the supply side must be fixed. Right now, the market for credits is opaque and riddled with inefficiency. Buyers can't be sure which credits are credible, projects often don't deliver what they promise, and sellers can't be held accountable. This lack of transparency also opens the door for greenwashing, where companies claim to be making a much bigger difference than they are, which fuels public skepticism about the potential for private-sector leadership.

As a result, the market for carbon credits is much smaller—and far less productive—than it should be. This is a market failure we can fix, and the remedy starts with transparency. Transparency does for markets what spinach does for Popeye. The story of Bloomberg is a testament to that.

When we created Bloomberg in 1981, there was virtually no way for firms (especially smaller ones) to negotiate bond prices with sellers, because sellers had all the information. As a result, prices were inflated, commissions were enormous, and the market was inefficient. By creating real-time bond pricing and making it available to buyers as well as sellers, we helped level the playing field and allowed more capital to flow to productive assets, benefiting investors—no matter how small their portfolios—and driving economic growth.

For markets to work well, they must be transparent, trusted and standardized—three qualities that have largely eluded the market for carbon credits. But change is coming.

The Biden administration on May 28 released a policy statement and set of principles for building more transparent, responsible and effective voluntary carbon markets. It's an important step forward that builds on work led by the Integrity Council for the Voluntary Carbon Market and the Voluntary Carbon Markets Integrity Initiative.

Together these efforts have the potential to do for the carbon market what the Bloomberg Terminal helped do for the bond market in the 1980s. Through transparency and standardization, we can generate more trust that these investments are sound, turning a relatively small market into an enormous one and a relatively inefficient one into a powerhouse. That will help us unleash the market power that we desperately need on our side in this fight. *For more commentary, go to bloomberg.com/opinion*

AGENDA

ILLUSTRATION BY SHWETA SHARMA

▶ Europe's Right Turn

In elections for the European Parliament, June 6-9, political observers expect to see a lurch toward populist parties. For the first time, a right-leaning coalition of Christian Democrats and other conservatives could lead the body.

▶ Following the death of President Ebrahim Raisi in a helicopter crash on May 19, Iran has scheduled early presidential elections on June 28.

▶ The European Central Bank sets interest rates on June 6; the US Federal Reserve, on June 12; the Bank of Japan, on June 14; and the Bank of England, on June 20.

▶ The UN marks the International Day of Innocent Children Victims of Aggression on June 4—even as shocking numbers of kids are dying in conflicts in Gaza and Sudan.


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Alaska, Hawaii, and offshore destinations), or containing
hazardous materials or live animals may receive slower service.
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Why Inflation Could Whip Biden

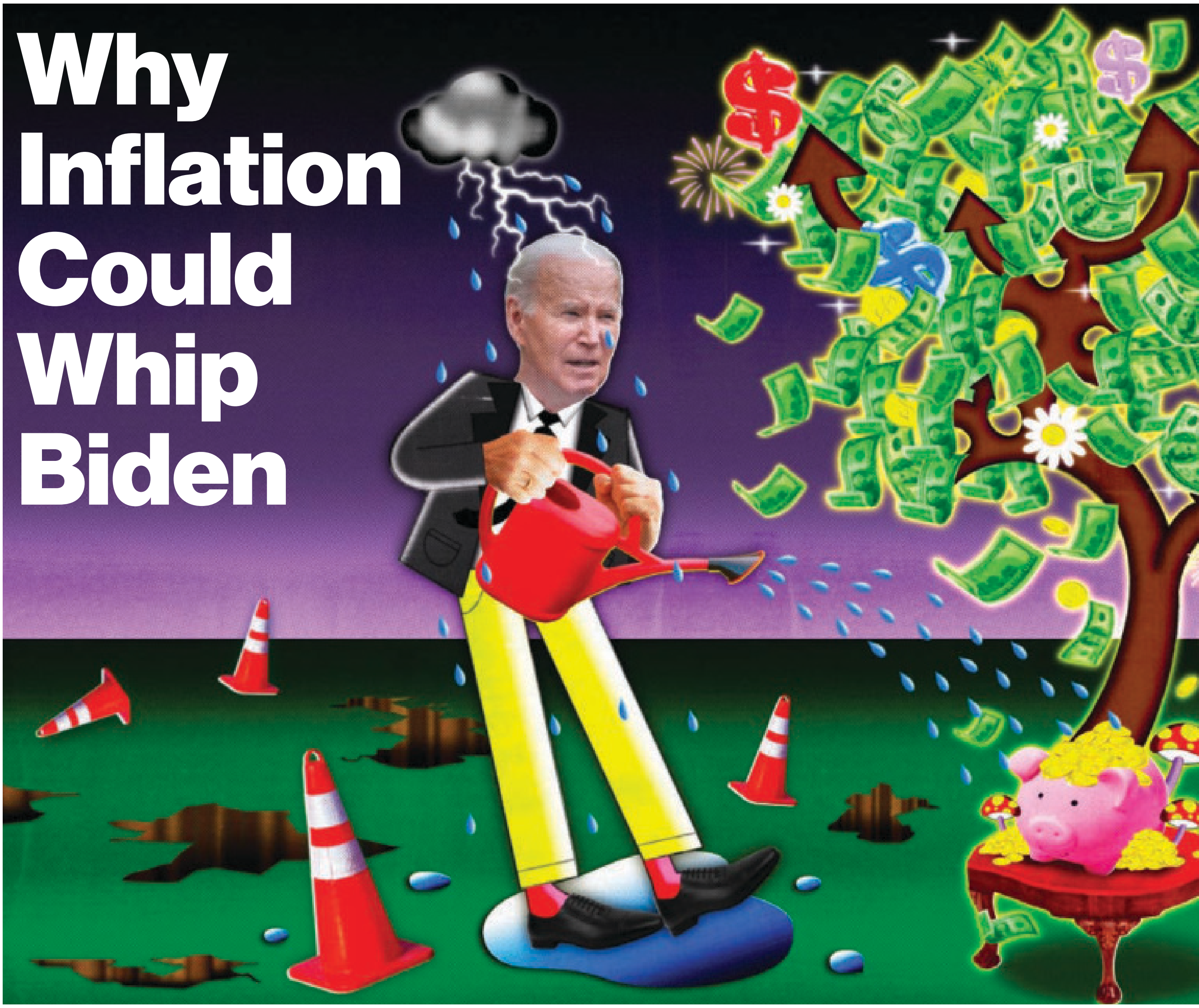

PHOTO ILLUSTRATION BY RUI PU; PHOTOS: GETTY IMAGES (13)

● The economy is strong, but people are mad about higher prices for food and energy, and many blame the president

● By John Authers

Stock markets are booming, regularly hitting new all-time highs. Unemployment is near a historic low, the economy is growing at a healthy clip and inflation continues to drop toward normal. So why are Americans convinced their economy is in deep trouble?

Opinion poll after poll shows strong majorities unhappy with the economy and blaming President Joe Biden for it. Some of this is in the face of verifiable facts. A Harris Poll survey for the *Guardian* last month found that 55% think the economy is shrinking, 49% think unemployment is at a 50-year high (not a low) and 49% think the benchmark S&P 500 stock index is down for the year. It's a matter of fact that all these beliefs are wrong. The S&P was up about 12% for the year when the poll was conducted and almost 29% over the previous 12 months.

It's not only opinion polls. Surveys of consumer sentiment, as carried out by the University of Michigan and the Conference Board, show optimism lower even than in 2008, the year of the global financial crisis. Such negativity can in turn deter people from taking risks and raise the risk of a recession.

The standard metrics that give the economy a good bill of health have their flaws, but they're not fake (whatever the conspiracy theorists say). So how do we explain why most of the population feels just as bad as they do during a recession?

The familiar evils of our age doubtless widen the divide. Political polarization has left much of the population determined to see only the worst under Biden. When the Michigan survey is broken down by party identification, it turns out that Republicans think current conditions are worse than at any point during the Great Recession. Online echo chambers amplify such sentiments, as do the lingering anger and discontent in the wake of the pandemic.

But polarization alone can't explain this away. The heart of the division lies in the economy, which has delivered a brutal one-two punch to people's sense of well-being. To the deepening inequality that had festered and intensified for decades was added the inflation shock after the pandemic. That led to the biggest one-off rise in the costs of essentials in decades. This makes the many who were already slipping behind even worse off, even though the overall economy is in decent shape.

Inflation measures are easy to distort and widely misunderstood. Take the distinction between inflation rates and price levels. To say that year-on-year inflation is back to normal for much of the economy isn't sophistry. It's undeniably true. But that doesn't mean prices have dropped back to where they were before. The price of eggs doubled during the first two years of Biden's term. Egg prices have since come down, but they're still 44% higher than at the beginning of 2021. Many people evidently think it's untruthful to claim that inflation is falling because prices remain far higher than they were when Biden took office, but there's nothing dishonest about it. Inflation is expressed as a rate of change—but it's the ongoing higher price level that matters more to most of us.

The concept of core inflation, which excludes food and energy, generates even more anger. It's widely denounced as a denial that these prices matter, which massages the numbers down. Such beliefs are a total canard. Food and energy are excluded because they're variable and largely beyond the reach of monetary policy. Central bankers need to know about core inflation to gauge how effective their policy is.

It's also not true that the core is a way to bring the headline numbers down. Food and energy prices are moving downward at present. Thus core inflation is higher than the headline number. Anger at pointy-headed economists excluding those prices is totally misplaced.

However, rage over core inflation does bring us to the heart of the issue. Not everyone buys the same things, and basic essentials, such as food and energy, take a bigger chunk of lower-income people's budgets. And this begins to show why things seem so bad to so many.

Jason De Sena Trennert of Strategas Research Partners constructed a Common Man Inflation index of items that people must buy regularly—food, energy, shelter, clothing, utilities and insurance. Nothing discretionary is included. In April, Common Man CPI grew at 3.8% year on year, higher than headline CPI for the ninth consecutive month. Common Man CPI so defined has topped headline inflation in 34 of the 40 months of the Biden administration to date. As Trennert comments, "As an election issue, President Biden may be running out of time to turn voters' perceptions of things around."

Another measure might be called the "anti-core"—an index including only energy and food. This measure had been steady for many decades but suddenly moved sharply higher in 2021. When Bloomberg's Carolyn Silverman and Jonathan Levin crunched the numbers using the relative weights for food and energy, they found that this anti-core had risen less than 5% in the eight years from 2012 to 2020—an annual rate of about 0.6%. Under Biden, it's risen an additional 26%. That rise was over by the summer of 2022, and anti-core inflation has now turned slightly negative, but prices are still more than 25% higher than they were in 2021.

We don't have the weighting measures going back to the start of the food and energy indexes in 1959. When I tried to create a crude measure of food and energy by adding the two index numbers directly, which should at least be a decent rule of thumb, it showed that anti-core inflation in 2022 was higher even than in the early 1970s. It had only ever been higher in 1980.

Anti-core inflation has now moved into slight deflation or outright declines in prices. Historically this is rare; food prices almost never drop. In previous inflation spikes, people knew this because they had lived through such waves of price rises in the past. This time was different. Price rises had been moderate since the mid-1980s and very low indeed in the decade after the global financial crisis. Consumers are used to the prices of essentials rising only very slowly and have no folk memory that these prices don't come down. No postwar president has presided over falling food prices. But Biden's food inflation, running at 6.5%, ranks second only to Richard Nixon's.

People have noticed this, and it's driving their economic negativity. A poll in seven swing states conducted by the *Cook Political Report* found only 6% of respondents named the stock market as the most important way to measure the economy, and only 13% picked low unemployment. Instead, 54% named the cost of living. They blamed the president, with 59% saying that the administration had the power to bring down prices.

There's little way out for Biden because the inflation that's causing pain afflicts the prices over which politicians and central bankers have the least control. Short of using taxpayers' money on subsidies, there's nothing the president can do about food prices. As for oil, driven of late by geopolitical events, Biden has already used his one most obvious weapon, to release barrels from the Strategic Petroleum Reserve.

In a further irony, the food and energy prices over which the president has the least control, and on which he's judged, have stopped rising. Services inflation remains high, and may well be down to policy errors such as spending too much on stimulus payments, which started under Donald Trump and continued under Biden, or the Federal Reserve's decision to leave interest rates at zero for two full years until 2022.

But that's not what drives the economic despair, and it's close to inconceivable that anything could happen between now and the election to ease that. It's true that the economy as a whole is in good shape and that the greatest pain isn't Biden's fault. None of that changes the fact that the cost of living grew much heavier under his watch, and many voters will judge him for that.


When's the best time to trust your instincts?
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◀ Greg Harden at the Walmart he manages in Grand Prairie, Texas

SHELBY TAUBER/BLOOMBERG

Yes, Walmart Store Managers Really Can Make $500,000

To boost retention, the retailer sweetened pay and stock incentives for its store chiefs, whose locations employ hundreds and can exceed $100 million in annual sales

Edited by James E. Ellis

◀ After working as a Walmart store manager in the Dallas area for more than a decade, Greg Harden has seen it all. Walmart Inc.'s procedures for managing schedules for hundreds of store associates, keeping track of delivery vehicle arrivals and even checking gasoline pumps for customers had all become second nature. But earlier this year he got some news about Walmart that took his breath away. The retailer redesigned its compensation scheme in a way that would significantly increase store manager pay with stock grants and bonuses. With the changes, Harden could make as much as $530,000 this year. "I almost fainted when I found out," he says.

The world's largest retailer is rethinking one of its most important roles after falling behind the competition. A couple of years ago, Walmart's attrition rate for store managers spiked to almost double that of other big-box retailers such as Home Depot Inc. and Target Corp., according to data from human resources analytics company Revelio Labs Inc. Departures first ticked up when Walmart cut management ranks in the late 2010s, saddling those who remained with more work and longer hours, according to two former managers who declined to be named. At the time the company was more focused on improving conditions for its hourly workers, investing billions of dollars in upgrading their wages.

From there, the manager attrition gap between Walmart and its competitors widened as the pandemic brought new challenges and obsolete technology made the job onerous and clunky. When Vanessa Bennett started as a manager at a Walmart in Grand Rapids, Michigan, nearly two years ago, she says she used an old computer with outdated software for scheduling shifts. "It was absolutely awful," she says of the technology. Manager Oscar Romero says his day began with 40 minutes of paperwork. "I'd have to go through reports to look at my sales. If I wanted to look at inventory, I'd have to go to another report," says Romero, who oversees about 550 people at a Walmart in Calexico, California, near the Mexico border.

Souped-up compensation is just the most recent in a string of changes made to improve managers' work life. New technology has cut down on hours of busywork, and new benefits include telehealth and doula services. The initiatives have helped boost retention and lowered turnover rates in the last year, says Cedric Clark, Walmart's executive vice president of store operations. Engagement scores that measure how managers feel about their jobs have also risen, he says.

The company declined to share exact figures for either metric, but according to Revelio's data, Walmart's annual attrition rate has fallen by about 2 percentage points in the last year to around 21%. Managers say they see a difference. "It's been night and day," Harden says.

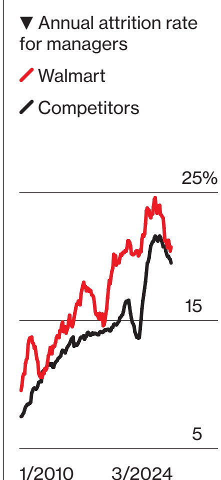
Walmart made one of the most significant changes for managers in years in January, when it announced it would substantially boost their pay. They'll now receive annual stock grants of as much as $20,000. Average base salaries for store managers were raised to $128,000 a year, from $117,000. The retailer also changed the way it calculates those managers' bonuses: It will continue to evaluate sales, of course, but the profit generated by a manager's store will play a bigger role. "If you hit all targets, your bonus could now be up to 200% of your base salary," according to a note to managers from Clark. So a successful manager of a high-performing store can now pass the $500,000 mark.

Running a Walmart is more complex than most retail jobs, says Jin Yan, a senior economist at Revelio. The retailer's Supercenters, which average 178,000 square feet, tend to be between 30,000 square feet and 50,000 square feet larger than a Costco or Target, and they offer more services, including auto body shops and pharmacies. Many have mini-warehouses in the back that move hundreds of pallets of products every day. And the sheer volume of sales is enormous. One Walmart manager estimates he sells a truckload of dog food a day.

Harden currently oversees 400-plus employees and more than $100 million in sales at one of the biggest stores in the Dallas region, in Grand Prairie, Texas. By 7 a.m. he's at the store getting feedback from overnight staff and checking the grocery section. Throughout the day, he makes sure aisles are full, price tags are visible and truck deliveries are on time. By the end of his 10-hour shift, he's walked as many as 6 miles and talked to about 200 people. Before recent changes, his days were even longer. "I worked 5 a.m. religiously, probably six days a week," he says.

The burnout risk is high: One former manager told *Bloomberg Businessweek* he left recently for a less intense job. The pay at Walmart didn't make the stress and long hours on his feet worth it.

Attrition is expensive for any company. For Walmart it comes with its own set of problems. Because the retailer tends to hire from within—about 75% of its field management team began their careers as hourly employees—Revelio's Yan says that when managers leave, they take many years of institutional knowledge with them. Managers say the job is like being the chief executive officer



"I almost fainted when I found out" how lucrative Walmart's new store manager pay plan can be

NANNA NAVNTOFT/BLOOMBERG. DATA: REVELIO LABS of a small business mixed with a local politician. When one departs, it also means losing a community leader. “I think you can run for mayor if you’re a Walmart store manager,” Romero says.

When a series of open mic listening tours revealed frustrations that managers have with their heavy workload, the company in 2021 rolled out the Me@Walmart app that it built, which allows managers to track sales, inventory, staff schedules and more, saving them time. Every employee who works at a Walmart store gets a phone with it installed.

Since then, the retailer has added more features on the mobile devices. Its VizPick app scans hard-to-reach top shelves and flags whether specific products are available, running low or out of stock. A profit-and-loss app breaks down sales, profits and other important metrics that were often handwritten before. Over time, the company wants to bring more functions to the Me@Walmart app.

Romero, the manager in California, checks the app first thing in the morning. Throughout the day, he uses his device to take photos of things to fix and to make to-do lists for his staff. “I can pull out my app, and it will tell me sales for the day, how many trucks am I getting in, whose birthday it is,” he says.

Ultimately, improving managers’ work life is meant to boost store sales, says Clark, Walmart’s store operations chief. “If we make it the best place to work, they in turn take care of the customer.”

Walmart’s business has been booming since the pandemic, even as some competitors have started to struggle. Sales have grown about 30% for its US business over the past four years, as the retailer wins over inflation-weary consumers of all income levels with its discounts and low prices. It plans to open new Supercenters for the first time in roughly two years.

Because compensation changes are now tied more closely to store performance, managers say they’re more motivated to improve sales. “I’m in control,” says Mustafa Tovi, who oversees a Walmart in Dallas. “I’m focused on growing the business and controlling profit.”

Although most merchandising is handled out of headquarters, managers have some say in what they stock and can be creative with how they drive sales—a holdover from when founder Sam Walton scoured the country for items to sell in the earliest Walmart stores.

One year, Romero decided to stock up on Mattel Inc.’s Hot Wheels model cars. He put up displays throughout his store, appealing to collectors and other fans. He sold more than any of the 4,600 other stores in the country. Walmart sent him a trophy for the occasion that he keeps in his office.

His latest gambit is putting plastic pools in pet aisles. After quickly selling out last summer, he reached out to the merchandising team about ordering more for this year.

“This year I said, ‘You know what? We need to get more pools,’” Romero says. —*Jaewon Kang*

THE BOTTOM LINE After the attrition rate for Walmart store managers spiked to nearly double that of some rivals, the retailer has raised compensation and reduced busywork to stem the tide.

Making Ozempic’s Secret Sauce

● Novo Nordisk needs more semaglutide, the key ingredient in new weight-loss drugs. So it’s expanding the plant where the magic happens

Michael Hallgren, the almost 7-foot-tall Dane tasked with boosting Novo Nordisk A/S’s production of the key ingredient in Ozempic, needs a car to navigate the sprawling factory complex rising on what were once fields of grain outside Kalundborg, a former fishing village of 16,000 in Denmark. Inside, it takes Hallgren a few minutes just to cross one of the company’s massive halls lined with two-story steel vats for drug ingredient production. The facility is scheduled to start churning out medicine next year, but Novo has said it doesn’t know when it will be able to satisfy global demand for Ozempic and its sister drug, obesity medicine Wegovy.

▼ Hallgren at the Kalundborg facility

◀ After vastly underestimating the demand that would exist for weight-loss drugs, the company is playing catch-up with an eight-year and more than $8 billion expansion project that's due to finish in 2029 at the Kalundborg site. Novo is battling US drugmaker Eli Lilly & Co. for the lead in the booming market for the pound-shedding meds. The longer it takes Hallgren to scale up ingredient production, the more sales Novo risks losing, either to Lilly or to the compounding pharmacies that are supplying copies of Wegovy, thanks to a US regulatory loophole that allows them to provide a version of the drug as long as it's in shortage.

"There's always some troubles in the beginning when you ramp up something that is brand-new," says Hallgren, whose official title at Novo is senior vice president of active pharmaceutical ingredients manufacturing. "I'm very confident that we will be fast in full operation—and then you ask me how fast, we will do our very, very best to be very fast."

Kalundborg is one of only two places in the world where Novo makes semaglutide, the active ingredient in Ozempic and Wegovy, Hallgren says. The other is a factory in North Carolina. Just how closely investors are watching the coastal Danish town became clear in mid-May when news of a rooftop fire at the construction site briefly wiped more than $20 billion off Novo's market value. The drugmaker has now halted all roof repairs while it tries to figure out what went wrong, Hallgren says.

Novo has an enormous amount riding on the success of Ozempic and Wegovy, which analysts estimate will have combined sales of more than $26 billion this year. Weight-loss drugs will probably become a $100 billion market by 2030, according to Goldman Sachs Group Inc.

Wrestling with production challenges is nothing new for Novo. It spent the first half-century of its existence trying to figure out how to boost yields for its other signature product, insulin. Its founders in the 1920s worked in their basements to extract insulin out of pig pancreases. By the mid-'80s, the Kalundborg site was processing 25 tons of pig pancreases a day from slaughterhouses all over the world, Hallgren says. Then the advent of genetic engineering made it possible to program yeast cells to make insulin instead, vastly increasing the number of people who could be treated. When it came time to make the new GLP-1 class of diabetes medicines, the drugmaker decided to use the same process.

Novo's yeast cultures are essentially tiny drug factories. Based on baker's yeast, they're genetically modified to produce the company's altered version of the GLP-1 hormone that the body produces after a meal. That compound lowers blood sugar levels, slows the movement of food from the stomach and makes patients feel full faster and longer, resulting in weight loss.

Unlike Eli Lilly, which has turned to external contract manufacturers to help make its rival GLP-1 drug Zepbound, Novo is keeping Wegovy and Ozempic ingredient production in-house. That's a relatively uncommon step for a drugmaker. But Novo wants to protect its production secrets by housing them in only a few places, Hallgren says.

"Nobody else in the world is doing what we're doing," he says. "That's our crown jewel."

Using yeast means it takes longer to scale up production than it would if Novo used chemicals to produce the active ingredient—as Lilly does in Zepbound's production. But when done right, it's cheaper and generates less waste, Hallgren says.

It all starts with a tab of yeast the size of your pinkie fingernail. It's put into a nutrient broth in a glass flask, then moved to a fermenting tank. There, given vitamins, lots of sugar, the right temperature and pH, and a huge amount of sterile air, it multiplies wildly. The progeny of a single fingernail of yeast can churn out drug ingredients for weeks—in the case of insulin, enough to treat 500,000 people with diabetes for a year. "That's the reason why we think that yeast is the most efficient," Hallgren says. —*Naomi Kresge and Sanne Wass, with Madison Muller*

▲ Purification machinery at the Kalundborg plant

NANNA NAVNTOFT/BLOOMBERG

THE BOTTOM LINE After underestimating demand for its GLP-1 weight-loss drug, Novo Nordisk is racing to boost production and avoid losing ground to rival Eli Lilly.

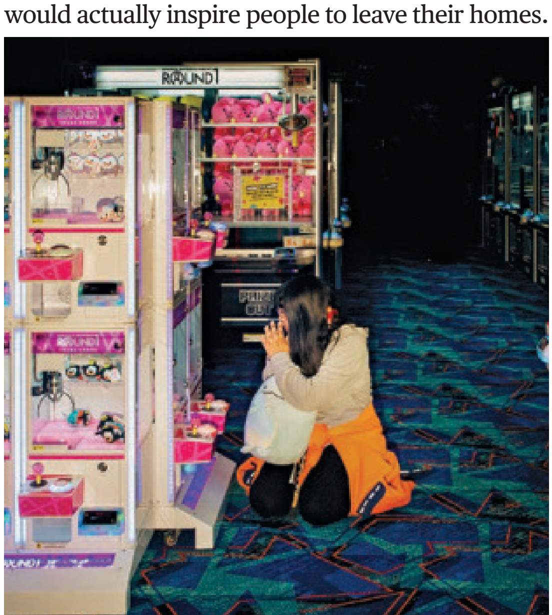

TURKISH AIRLINES
A PERFECT MOMENT TO
ENJOY DELIGHTFUL FLAVORS
Connect with our award-winning meals.
A STAR ALLIANCE MEMBER
Products and services are subject to change depending on flight duration and aircraft.

US Malls Are the New Japanese Arcades

● Round One is accelerating its push into shopping centers

In November 2021, Eric Bunyan led a group of Japanese businesspeople through an empty space in the Danbury Fair mall that had once been a Forever 21. The girly-pop retailer had vacated the two-story, 60,000-square-foot location after going bankrupt in 2019, during a grim yearlong stretch in which the Connecticut mall had also lost its Sears and its Lord & Taylor.

Bunyan, who was in charge of leasing for the mall's owner, Macerich Co., recognized that department stores weren't returning to glory. The internet, he says, meant "there are better, faster, cheaper options" for buying underwear and T-shirts. He thought his guests, representatives from the Japanese arcade chain Round One Corp., might offer a way to turn the massive space into something that would actually inspire people to leave their homes.



Edited by
Joshua Brustein

◀ Round One's arcade at the Danbury Fair mall in Connecticut

By the time Round One's employees checked out Danbury Fair, the company had more than a decade of experience striking deals with struggling mall owners. Dozens of American malls were already housing its locations, with their LED-lit Japanese video games and Sapporo beer. Round One, which sees US malls as a way to reduce its reliance on Japan as that country's population ages out of the prime arcade-going demographic, has been accelerating its efforts to build out its operations in the US. For US malls, arcades look like a way to help pull out of what many people have long assumed was an irreversible death spiral.

Round One opened its location in Danbury Fair in March. It is its 54th arcade in the US and, like the other 53, a bet on cross-cultural entertainment. The arcade offers American favorites such

▲ Emmanuel Vargas and his dad play *Fast & Furious* in Burbank, California

as bowling and chicken fingers alongside Japanese staples including fried octopus balls, karaoke, claw machines and—perhaps most notably—the arcade blockbuster *Dance Dance Revolution*. Copyright restrictions make exporting Japanese arcade machines surprisingly tricky, and their presence means Round One can count on ravenous gamers traveling from hours away, leading to a festive atmosphere that sparks curiosity among newcomers, too. "We're aiming to give people who can't go to Japan a glimpse of it," says Peter Yu, the company's senior director of operations, as he weaves between rows of claw machines just before the opening. Each one is labeled with the type of plushie that will fill it, like a panda steeping in tea or an anthropomorphic s'more.

Round One started in an Osaka roller-skating rink that the company's president, Masahiko Sugino, took over from his father when he was still a college student in 1980. The rink was losing ▶

FROM LEFT: PHOTOGRAPHS BY DINA LITOVSKY FOR BLOOMBERG BUSINESSWEEK (3). PHOTOGRAPH BY MAGGIE SHANNON FOR BLOOMBERG BUSINESSWEEK (1)

◀ Takahashi

◀ money, and Sugino's father wanted to shut it down. Sugino suggested instead expanding into other forms of entertainment. That basic idea would evolve into the modern Japanese arcade—LED-lit palaces filled with grunting gamers and baby-voiced anime games—and turn Round One into a billion-dollar company. Its most famous location, an 11-floor complex in Osaka featuring game machines, bowling, batting cages, basketball courts, karaoke and go-karting, draws large numbers of US tourists in addition to Japanese gamers.

Around 2010, Round One executives decided to act on growing concerns about stagnation. It had 105 Japanese locations but saw the country's low birthrate as a serious threat. "We have to think about the next 20 years or so," says Hirotoshi Takahashi, Round One's US president and chief executive officer. "We can't just keep expanding in Japan."

That same year, Round One opened its first US location. It chose the Puente Hills Mall, a struggling shopping center in the Los Angeles suburbs whose claim to fame was that Doc Brown used its parking lot to drive a DeLorean back in time in the 1985 movie *Back to the Future*. The company has steadily expanded in the US since then, and in its most recent fiscal year, which ended in March, US stores accounted for 37% of its overall revenue, up from 16% five years earlier.

Round One's US locations are significantly more profitable than those in Japan, mostly because they attract larger crowds. The company plans to open about 10 stores a year until it's reached almost 200—twice the total number it had planned in 2017. Its closest regional competitor, Texas-based Dave & Buster's Entertainment Inc., operates 220 locations in the US and Canada.

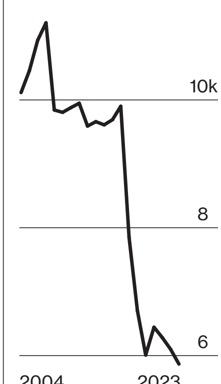
Round One executives say they're not competing directly with Dave & Buster's, which straddles the line between a sports bar and a kids' birthday party spot. Round One also looks to draw kids but aims to please gamers and *weeaboo*, slang for Westerners obsessed with Japanese anime and video games. It leans heavily on American affection for Japanese cultural exports, which have gone through a streaming-era spike in popularity. Weeaboo are well aware that Round One is one of only a few licensed importers of Japanese arcade game machines, some of which can't even turn on without a connection to their parent companies' servers.

Skylar Damiano, 33, estimates he spends about \$60 a month on Konami Group Corp.'s *DanceRush Stardom*, a successor to *Dance Dance Revolution* that involves tapping out the rhythm to Japanese pop songs on the machine's foot pads. Between his weekly visits to his local mall in Aurora, Illinois, Damiano monitors Discord chatrooms where gamers discuss which titles are available at which Round One locations. In April he flew to Texas to compete in a *DanceRush Stardom* tournament at a Round One location near the Dallas-Fort Worth airport. "I can walk into any location around the world and potentially meet up with online friends, or make new friends," Damiano says.

While gamers are probably Round One's most passionate customers, the company's most lucrative offerings are the claw machines, where patrons spend about \$2 a pop to try to snag toys tied to popular anime properties. The company is increasingly repurposing space it had dedicated to video games for more claw machines, in an initiative it's dubbed "Project Mega Crane." Round One's success doesn't necessarily translate into success for its host mall. The Round One location at Puente Hills is the company's highest-grossing location nationwide, even though the mall's occupancy rate hovers around 60%. Being in a struggling shopping center isn't necessarily a problem, says Sugino. "If we keep working on improving stores and raising awareness of our brand, I don't think we need the malls to be full of people," he says.

But in other places, novel entertainment experiences have been key to a rebound in malls' fortunes. Mall operators are experimenting with other offerings, such as playgrounds for adults ▶

▼ Department stores in the US



"We're aiming to give people who can't go to Japan a glimpse of it"

PHOTOGRAPH BY MAGGIE SHANNON FOR BLOOMBERG BUSINESSWEEK. DATA: IBISWORLD

◀ and obstacle courses based on the TV show *American Ninja Warrior*.

For upscale malls, sales are up 7% from pre-Covid levels, according to data from Green Street, a real estate data analysis firm. In roughly the first two months after the Round One opened at Danbury Fair, the mall's overall traffic was up 18%, says Bunyan. Beaming from behind one of Round One's concession booths, Danbury Fair's general manager, Maura Ruby, says she's confident they've hit on the social element that's always been key to getting people out of their houses and to the mall. "We want to offer something that can't be captured on an internet platform," she says. "A life experience." —*Cecilia D'Anastasio and Takashi Mochizuki*

THE BOTTOM LINE Round One is interested in the US as a hedge against an aging population in Japan, and US malls are eager for new ways to get people in their doors.

Cosmic Particles and Secret Tunnels

● Israel's archaeologists and its military are testing muography as a way to map underground areas

In a cave and tunnel under ancient Jerusalem's City of David, two machines the size of dressers have spent months tracking subatomic particles as they fall from space and penetrate deep underground. These fleeting particles, known as muons, travel at almost the speed of light and exist for fractions of a second. Observing them during their short life can help map areas that aren't visible to the bare eye—in this case, an underground area near the site known to Jews as Temple Mount and to Muslims as Haram al-Sharif, a place whose religious significance means archaeologists try to avoid any unnecessary digging.

While most of the physicists working at the site are academics, several work for Rafael Advanced Defense Systems Ltd., one of Israel's state-owned defense contractors, which has an additional agenda: refining the technology to help map the network of tunnels Hamas has built under the Gaza Strip. Rafael began talking with physicists at Tel Aviv University about using the technology at least a decade ago, says Erez Etzion, an experimental particle physicist and professor at the university. "Obviously the security needs of Israel triggered us to move in that direction," he says.

The work in Israel, a hub of archaeological and defense research, is part of a global revival of interest in muon tomography, also known as muography. The technology observes muons as they strike every square centimeter of the planet at the rate of about one particle per minute. The particles penetrate the surface and travel as far as 500 meters (1,640 feet) below ground before they dissipate. If the particles dissipate rapidly, that indicates they're encountering high-density materials. If they pass through empty space (such as a secret tunnel), more of them will penetrate more deeply into the earth. That data can be converted into three-dimensional visuals, complete with chemical composition analysis.

▲ Yan Benhammou (left) and Etzion, both professors at Tel Aviv University, working with a muon detector

PHOTOGRAPH BY OFIR BERMAN FOR BLOOMBERG BUSINESSWEEK

There have been academic studies based on muography since the 1950s. Nobel Prize-winning physicist Luis Alvarez popularized the technique in the '60s, when he used it to rule out the existence of secret chambers in parts of the Great Pyramid of Giza. In 2017 researchers with the ScanPyramids project used muon detection to find such chambers in a different part of the same pyramid. Muon detectors have also been positioned at the edges of volcanoes to measure lava flow and predict eruptions, used to scan the nuclear reactors in Fukushima, Japan, and used to appraise weaknesses in infrastructure believed to be at risk of collapse. Academics in Japan have proposed using ▶

◀ muon-based navigation systems underwater and underground, where the GPS is weak or unavailable.

Los Alamos, the New Mexico lab where the atomic bomb was developed, produced a muon-scanning system that a startup spun out of the lab is applying to border security. The company, Decision Sciences, has been selling its tech since 2012 and says it can quickly scan containers for narcotics, evidence of human trafficking and explosives.

The price of detectors on the market, which can cost about $100,000, has meant limited growth. But technological advances can change that. In Estonia the startup GScan aims to reduce the low-end price of its detectors from €100,000 ($108,000) to €60,000 this year, then move to wider production in 2025.

The technology is a tempting fit for Israel's challenge of mapping tunnels in Gaza and Lebanon. Since Oct. 7, Israeli ground forces have been using a combination of sensors, ground-penetrating radar, remote-controlled bulldozers, flooding, cameras, trained dogs and drones—in addition to other unspecified "technological means"—to find and destroy Hamas' tunnels, says Nir Weingold, head of the planning, economics and IT division at the Israeli Ministry of Defense's research and development center. "Every solution works partially, and we need to build the best and the most robust solutions," he says. "But we still didn't find one solution or 'one size fits all.' It doesn't exist." Weingold declined to comment on muon tomography.

Using muon detectors in this context has significant challenges, not least the requirement that they be placed below the area they're scanning. To find "any sort of hidden tunnel, you need another tunnel," says Vitaly Kudryavtsev of the University of Sheffield in England. "So by digging this tunnel, you already think that you know where the tunnel in question is located or could be located."

In theory the detectors could be buried under areas where Israel suspects Hamas tunnels are likely to be rebuilt. Detectors could also be permanently established to monitor the entire border, alongside other sensors already in use.

It's unclear how Israel's pursuit of muography for military purposes overlaps with its archaeological uses. The researchers at the Jerusalem site hint at field testing for defense purposes and say Israel's security is their top priority. But they also say they can't disclose specifics, which are classified. Israel's Defense Ministry declined to comment.

A team of physicists showed up at the City of David one day in March to check the muon detectors and perform some maintenance. At ground level, the chatter from Hasidic boys on a field trip was drowned out by a mosque's call to prayer. Getting to the detectors involved descending into caves that were part of a national park, then climbing into a crawl space, where the tarp-covered device was leaning against a wall at a 45-degree angle.

◀ Etzion in the City of David

PHOTOGRAPH BY OFIR BERMAN FOR BLOOMBERG BUSINESSWEEK

Excavations nearby have unearthed underground rooms as recently as 2020. But at this particular spot, digging is too fraught, and no one knows what's behind the ancient stone walls of the crawl space. According to Etzion, many archaeologists believe it conceals a direct route that led from a spring that was the main water source of ancient Jerusalem to the site of the Jewish temples. The researchers hope muography can confirm that hunch.

Their operation isn't without complications. The internet connection used to gather data remotely sometimes goes out. The devices are sensitive to heat and humidity, and park workers have sometimes unplugged them accidentally. In one instance a detector got stuck in one tunnel shaft, then had to be dismantled and rebuilt inside another.

In May the researchers returned to the spot, carefully moving the muon detector along the wall to scan a nearby area where previous data suggested an anomaly. It's too early to tell whether there may be a secret chamber or anything else of significance there. Dozens of detectors would be needed to map out a whole tunnel, according to Etzion. If you use "enough detectors from enough angles," says Yiftah Silver, a Rafael physicist, "you can really perform a tomography of the underground in the same way that a CT scan works on your stomach or brain." —*Marissa Newman and Ott Tammik*

THE BOTTOM LINE Tracking muon particles to examine inaccessible areas is becoming useful for a wider range of applications, as sensors get cheaper and software improves.

Playing the Markets

FINA

The Origins of The WallStreetBets Revolution

Edited by Joshua Brustein

● An excerpt from Nathaniel Popper's *The Trolls of Wall Street*

By the end of 2011, Jaime Rogozinski, 29, had fallen into a rut. He spent his days in front of a computer screen in a windowless office at the Inter-American Development Bank in Washington, DC, where he had an unexciting job helping to maintain the endless databases of economic statistics that the executives used. After work, he took the train home to his bland condo in the suburbs that he hadn't bothered to decorate. When he came in at night, he generally made a beeline for his bedroom, where he spent more hours in front of a different computer screen, scrolling through the dribs and drabs of other people's lives on social media.

Rogozinski had not always been such a sad sack. Growing up in Mexico City, he'd been the kind of kid who did well in math, got along with the theater nerds and managed to win the title of class clown. He had a muscular jawline and a thick head of black hair that made it easy for him to get girlfriends. But the alcohol that was a social lubricant in college became an addiction in the years afterward. By 2011, six years after graduating, he generally drank alone, avoiding family and friends so no one would comment on the many red flags pointing to his dependence.

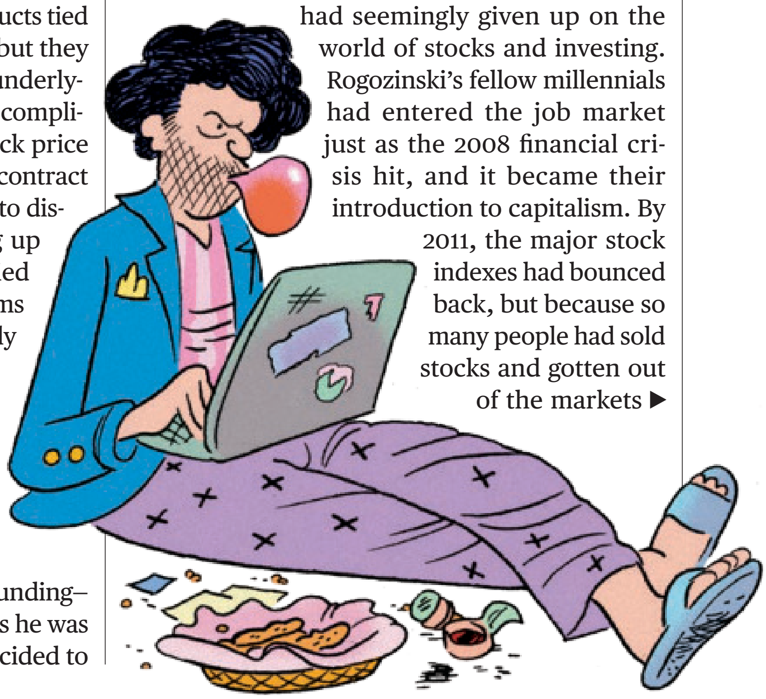
To fill some of the empty hours, Rogozinski had opened a brokerage account in 2011 and quickly moved from buying a few stocks to dabbling in options trading. Options are financial products tied to an ordinary stock, like Apple or Ford, but they move in much wilder patterns than the underlying security, because of a whole bunch of complicated factors, like the volatility of the stock price and the amount of time until the options contract expires. All of this was more than enough to discourage most young people from taking up options trading. But Rogozinski still carried the love of puzzles and complicated systems that he'd had as a child, when he'd gleefully taken apart radios and TVs.

To the few people with whom Rogozinski was still close, his antisocial behavior in these months looked like a cry for help. But as unlikely as it seemed, his evenings at the computer screen helped lay the foundation for a major—and, to many financial professionals, completely confounding—cultural movement in American finance. As he was drawn deeper into options trading, he decided to start an offbeat online community that would later become the voice of a new kind of financial trader who was glued to social media and eager to use speculation as a way to bond with like-minded people, while also being deeply cynical about the traditional financial system. The ramifications of this shift are still becoming clear, but the changes it's wrought seem to be enduring.

WallStreetBets, the bizarre and often offensive message board that Rogozinski started on Reddit, would eventually come to occupy a key position at the center of a movement that turned millions of young Americans into investors and traders. The world got its most recent reminder of this community in May, when some of its members briefly sent the stock price of GameStop soaring almost 500% over two weeks. (It quickly came back down, and as of May 29, it was below its price from a year earlier.) Most meme stockers aren't rich, or anything close to it, but when they come together on the internet, they have the power to send tens of billions of dollars into the stock market and the real-world companies the markets feed. It's a new kind of community and social movement, where people hang around after they're done trading because they're stuck at home and eager for company. The brash and aggressive attitude that's come to dominate the forum looked incomprehensible to many outsiders, but it spoke to a deep dissatisfaction and yearning for status and purpose in many of the people who became regulars.

The community is so remarkable, because it grew out of a moment in 2011 when Americans had seemingly given up on the world of stocks and investing

The community is so remarkable, in part, because it grew out of a moment in 2011 when Americans, and particularly young Americans, had seemingly given up on the world of stocks and investing. Rogozinski's fellow millennials had entered the job market just as the 2008 financial crisis hit, and it became their introduction to capitalism. By 2011, the major stock indexes had bounced back, but because so many people had sold stocks and gotten out of the markets ▶



ILLUSTRATIONS BY SAMMY HARKHAM

◀ during the crisis, the wealthy were the main people who benefited, exacerbating the inequality in the country. While the share of Americans who trusted banks fell to 32% in 2011, the proportion who trusted the stock market plunged even lower, to 12%.

Rogozinski got a daily reminder of this sentiment on his way to work each day, when he passed the local encampment of Occupy Wall Street, just a few blocks from the White House. Like the protesters, he'd gotten angry at the glaring inequality in society while watching Jon Stewart sound off about the state of affairs on nightly episodes of *The Daily Show*. In 2008, Rogozinski voted for Barack Obama. But he viewed his interest in trading as something of an unlikely offshoot of the principles motivating Occupy Wall Street. He wanted to understand the opaque financial products and buried risk that had made the economy so prone to crises.

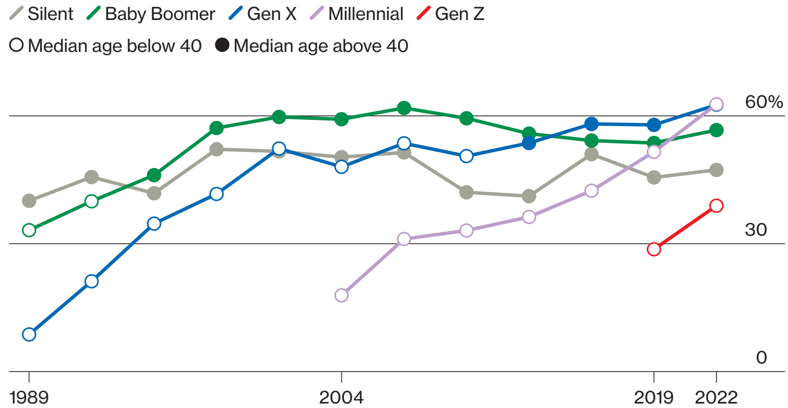
To find people who were investing, he went to Reddit, his preferred social media network, to have some semblance of a social life without anyone seeing his red, watery eyes or hearing his slurred speech. On Reddit, he was not Jaime Rogozinski the alcoholic; he was jartek, the screen name he'd created by mashing his initials with the word "technology."

For months, Rogozinski checked in daily on r/investing, the most popular Reddit forum dedicated to stock trading. But by early 2012, he had a yearning for something more. In part, he was looking for an even wonkier conversation about options. But he knew he also loved the more forbidden, irrational side of the markets—the part where the flashing digits shot adrenaline through his body and made him wake up in the middle of the night wondering what had happened since he'd last checked. This was a kind of drama he didn't get enough of in his staid life maintaining databases.

Reddit allowed its users to start their own forums, called subreddits, and he decided to take advantage. In late January 2012, as he ran through names associated with the risk he loved so much, he hit on the notion of betting, like in a casino. That and all the talk about Occupy Wall Street coalesced in his mind into a distinctive name: WallStreetBets. That was the kind of bet he wanted to make. Not the risks little kids take, but a real bet, the sort a trader at a Wall Street bank might make.

Buying In

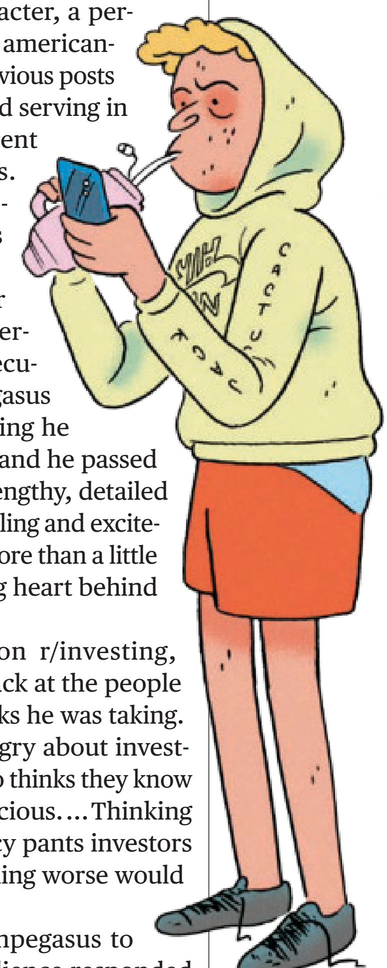
Share of each generation that owns equities, directly or indirectly



DATA: FEDERAL RESERVE SURVEY OF CONSUMER FINANCES

In the days after Rogozinski set up his subreddit, a few dozen people trickled in and subscribed, contributing posts about recent buys and sells they'd made. One of Rogozinski's most successful early posts was a jargon-filled description of a pair of offsetting options contracts, known as a straddle, that he'd purchased to bet on the price of Apple's stock. After a few weeks of this sort of thing, WallStreetBets wasn't amounting to anything memorable. It seemed his experiment might be short-lived.

But in one of his trips back to r/investing, Rogozinski spotted a new character, a person who went by the username americanpegasus. This user had lots of previous posts about growing up in poverty and serving in the US Air Force—a very different background from Rogozinski's. He seemed to share an obsessive curiosity about how things worked, something that had recently led him to discover penny stocks, the cheap, generally volatile shares in small speculative companies. Americanpegasus appeared to have read everything he could find about penny stocks, and he passed along what he was learning in lengthy, detailed posts. His writing sizzled with feeling and excitement. Even if some posts were more than a little naive and overdone, the pulsing heart behind them was obvious.



In one of his first posts on r/investing, americanpegasus had struck back at the people who got angry at him for the risks he was taking. "Most people seem to be so angry about investing, and so hateful of anyone who thinks they know anything they get downright vicious.... Thinking you're smarter than all the fancy pants investors can be disastrous.... The only thing worse would be to listen to their advice."

Rogozinski invited americanpegasus to join WallStreetBets, whose audience responded

ILLUSTRATION BY SAMMY HARKHAM. PHOTOGRAPH BY MARIAN CARRASQUERO FOR BLOOMBERG BUSINESSWEEK with appreciation to his contagious energy. This gave Rogozinski an idea. He liked options; americanpegasus liked penny stocks. They could have a contest where they each traded on behalf of the other to see who could make more money, with the winner keeping the proceeds. Rogozinski mentioned the idea to americanpegasus, and within days they announced their contest and got it up and running. To limit the risk of what they were doing, they kept what they put into the pot to $500 each.

During the first few days of the competition, americanpegasus pulled ahead, thanks to a bet on a tiny company that provided equipment to the energy industry: AGR Tools. Rogozinski didn't mind falling behind, because the contest was bringing a whole new crowd to his subreddit. The number of subscribers jumped to a few hundred in a matter of days. Rogozinski attempted to imitate his opponent's style. After a day with little action, he worked to convey the tension of deciding when to pull the trigger on a trade:

"Think of it as the duel scenes in the old clint eastwood movies where they stare each other down with the *waaweee waaweee waaaaa* music. Quite tense."

It was americanpegasus, though, who won over the crowd with his instinct to put everything in plain, personal terms without taking himself too seriously.

"I am a rookie and an idiot when it comes to trading," he said in one post. "Only a fool would make any trading decisions based off what I think."

The audience saw the potential. "This could easily be formed into a book, which then could eventually be turned into a movie, albeit a shitty one," one follower wrote. "Keep it up boys."

In the second week of the competition, the penny stock that americanpegasus had picked went south. This not only killed any chance he had of winning but also ate up most of the $6,000–his life savings–that he'd put into the stock. After he wrote a post about his losses, followers gave him a comforting pat on the back and said he'd managed to turn the minutiae of trading into genuine entertainment–the first time most users realized that was possible.

"This subreddit has officially become my first stop online," one commenter wrote.

"10/10 would read again," another member chimed in.

But americanpegasus had lost his entire savings in a matter of days, providing a reminder of why most people avoided actively trading stocks and why those who did try usually stopped after a first taste. This didn't seem like a drama that was likely to be repeated. In fact, though, it turned out to be a sign of big things to come.

▲ Rogozinski at his home in Mexico City in May

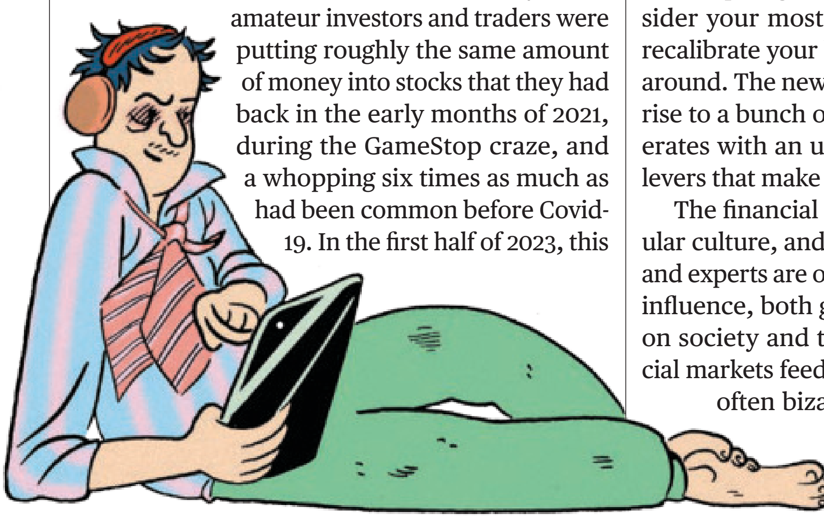
It was almost a decade between the launch of WallStreetBets and the beginning of the coronavirus pandemic. By then, millions of people had found Rogozinski's subreddit and the strange culture that had grown out of that early trading contest. This had given a motley crew of teenagers and young adults an unlikely obsession with stocks, monetary policy and financial infrastructure, turning arcane topics into fodder for viral Reddit threads and racy TikTok videos. That would only increase once everyone was locked at home with little to do and, in many cases, with more cash sitting around than usual.

Rogozinski had, by then, kicked the booze and started a family. But he saw the viral promise of what he'd created, and he tried to make it bigger. He wrote a self-published book about his subreddit and began putting together a trading game show, using the WallStreetBets name, just as the pandemic began. Unfortunately for him, a younger generation of self-proclaimed "degenerates" had taken over much of the day-to-day work involved ▶

◀ in running WallStreetBets. When Rogozinski showed up with his big ideas, they revolted and got Reddit to remove him from his top position on the forum. He fought, in vain, to win back control of the community he'd founded. But in the meantime, the moderators who took over built upon the culture he'd encouraged early on and attracted millions more members who were drawn in by the strange combination of dark comedy and dangerous trading practices.

The foolhardy trading that was performed on WallStreetBets, which violated all the established rules of investing, was a form of rebellion and a sign of the pervasive distrust of the old ways of doing things that had emerged in the wake of the financial crisis. This behavior was fueled by social media and was particularly strong among young men, who made up most of the members of WallStreetBets. A growing body of evidence indicated that after generations of occupying the top of society's food chain, young men were falling behind their female peers. In trends that accelerated after the financial crisis, they were now less likely than young women to have friends, earn good grades, graduate from college and secure jobs. Speculative trading promised an easy way to get out of a financial rut, while also feeling like a way to flip off the experts and boomers who'd laid the groundwork for so much of what seemed to be going wrong. These newly converted investors also became entwined with the community and ideas that had sprung up around Bitcoin and other cryptocurrencies.

Many people woke up to this new universe during the GameStop frenzy of 2021, and then assumed, soon after, that it had disappeared just as quickly, like so many other online flashes in the pan. But it's becoming clear over time that the youthful crowds have maintained their outsize interest in the financial markets. In early 2024, amateur investors and traders were putting roughly the same amount of money into stocks that they had back in the early months of 2021, during the GameStop craze, and a whopping six times as much as had been common before Covid-19. In the first half of 2023, this amounted to $145 billion flowing into stocks from amateur traders, compared with $21 billion in the first half of 2019, according to Vanda Research, a firm that tracks retail investors. The percentage of Americans who own stocks reached an all-time high in 2022, with the youngest generations diving in at the fastest rate, data from the Federal Reserve showed.



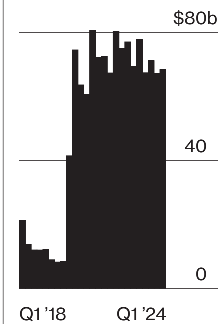
The generations that came before WallStreetBets generally opted for staid mutual funds. Only some dabbled in trading individual stocks or more speculative bets. In contrast to that, more than half of all members of Generation Z own digital tokens, according to a revealing report by financial regulators and academics in mid-2023. Individual stocks come in next, far ahead of the boring old mutual funds that used to dominate.

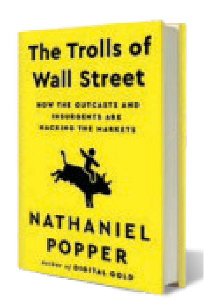
Many outsiders imagine trading as nothing more than gambling, no different from going to a casino or playing the lottery. And it can easily be just that. But unlike casinos, the markets are not zero-sum games. Stocks provide a way to channel savings into the economy, where they can be put to work building things and hiring people. When trading is approached correctly, both sides can come out winners. The novel ways that the young traders from WallStreetBets are investing are changing how companies raise money for their real-world operations. And there are early signs that the broadening ownership of stocks among ordinary Americans has helped boost the household wealth of many who didn't benefit from rising markets in the past.

Even when people lose money on their trades, the experience can offer a kind of education that isn't available to passive observers who think they understand the world by reading books or perusing the news. There's nothing like losing a week's paycheck to make you realize how an overconfident expert got it wrong or to force you to reconsider your most strongly held assumptions and recalibrate your behavior and ideas the next time around. The new world of online money has given rise to a bunch of self-described trolls and degenerates with an unprecedented knowledge of the levers that make the economy work.

The financial realm has become a part of popular culture, and that isn't going away. Academics and experts are only beginning to contend with the influence, both good and bad, that this will have on society and the real economy that the financial markets feed. What's clear for now is that this often bizarre new universe of money and trading sets this generation of Americans apart from any that came before. Ⓑ

▼ Net value of individual stocks purchased by retail investors





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Taking the Measure of Mexico's Next President

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● Claudia Sheinbaum is playing it safe as she campaigns on a platform of continuity

"It would take a meteorite of the kind that killed the dinosaurs" for Claudia Sheinbaum to lose Mexico's presidential election, said Pedro Miguel, one of the founding members of the ruling Morena party, back in September. "Not because of who she is," he said, "but because of what she represents."

It's true that with just days to go before the June 2 vote, a sense of inevitability hangs over the race. (Under Mexico's rules, media are barred from reporting poll results on the eve of an election.)

On the campaign trail, people scream "Claudia!" at the top of their lungs. Yet the former Mexico City mayor doesn't inspire the same level of fandom as her mentor, President Andrés Manuel López Obrador, known as AMLO. At her rallies, people wear T-shirts with a cartoon image of AMLO, ask her to sign a copy of his most recent book and give her letters to him thanking him for his service.

Speculation abounds as to how far Sheinbaum will diverge from the path set out for her by AMLO after she takes up residence in the presidential palace—and the degree to which she will confront head-on the problems the country faces. "The decision is simple," said Sheinbaum at an April 20 rally in Tila, a town in the state of Chiapas known for its Black Christ figure that attracts pilgrims from other parts of Mexico. "Do you want to continue the transformation started by President López Obrador, or do we want to return to a past of corruption and privileges?"

Her emphasis on continuity may explain why markets have been oddly calm for an election year. The Mexican peso has been a top performer among 16 major currencies tracked by Bloomberg this year. Rating agencies have shown no sign that Mexico could be headed for a downgrade, despite the president's spending on a plethora of new social programs and contested moves to support the indebted state oil company. Ask business leaders, and most seem to think they know what they're in for.

The paradox is that Sheinbaum offers some strong contrasts to the president. She was born into a family of scientists in Mexico City, while ▶

Edited by Cristina Lindblad

◀ he grew up in the faraway state of Tabasco, the son of store owners. She trained as an engineer and peppers her speeches with statistics; he's a lifelong politician with a penchant for staging show-stopping street demonstrations. And at 61, she's almost a decade younger and, not least, a woman in a political landscape traditionally dominated by men.

López Obrador has been the face (and brains) of the Morena party since its birth a decade ago, and his three presidential bids before he won in 2018 made him a household name. Not so Sheinbaum, who served as Mexico City's environmental secretary in the early 2000s when AMLO was mayor, then was a borough president. Later, she was handily elected mayor herself.

Despite her being relatively unknown to voters at the start of the race, especially outside the capital, support for López Obrador has quickly translated into backing for Sheinbaum. On the campaign trail, she's been cautious about letting slip any proposals that might suggest a departure from the course charted by the incumbent.

When questioned about her record, she rattles off statistics, boasting during a presentation to businesspeople in April that, on a per capita basis, Mexico City had a lower homicide rate than Los Angeles or Washington, DC. As president, she'd add a few programs such as grants for all public schoolchildren and assistance for middle-aged women not yet eligible to receive a pension—the kinds of changes nobody would quarrel with. But largely, she's sticking to his script.

"One of the biggest questions right now is, who really is Claudia Sheinbaum?" says Ernesto Revilla, chief Latin America economist at Citigroup Inc. "Everybody points to her credentials and her degrees as evidence of pragmatism and moderation, and others point to her involvement in Mexican left-wing parties and her political trajectory as evidence of being more similar to AMLO. And honestly, I think all of that is speculation and nobody really knows."

Sheinbaum has an academic record that includes a doctorate in energy engineering from the prestigious National Autonomous University of Mexico and contributions to two influential reports by the United Nations' Intergovernmental Panel on Climate Change. Businesspeople see her as potentially more market-friendly than AMLO and open to change in policy areas such as energy and private investment.

It's true that Sheinbaum "shares a vision of government and fundamental principles" with AMLO, says Luz Elena González, whom Sheinbaum tapped as administration and finance chief for Mexico City.

◀ AMLO and Sheinbaum dolls for sale in Mexico City

But calling her AMLO's heir "seems disrespectful," given that she achieved "results like nobody else" in the capital, González says.

During her tenure as mayor of Mexico City from 2018 to 2023, she was praised for making the capital safer and for being quicker than the federal government to respond to the Covid-19 pandemic. Yet her administration—along with the federal government—was also faulted for underreporting deaths from the coronavirus. And following the 2021 collapse of an elevated subway line that killed 26 people, she was criticized in the media for not owning up to the city's infrastructure shortcomings.

Xóchitl Gálvez, the candidate for the opposition coalition Strength and Heart for Mexico, hasn't made much headway with her attempts to raise doubts about the incumbent's record and Sheinbaum's clean image. Also, memories are still fresh of the failed strategy to target drug cartels and the corruption scandals that characterized the presidencies of the PAN and the PRI, the two main parties in Gálvez's coalition.

If AMLO were not constitutionally barred from seeking a second term, it's all but certain he'd easily win. He's endeared himself to a vast swath of the Mexican population, partly through political grandstanding, partly through adept policymaking. In his six years in office, he almost tripled the minimum wage in nominal terms and expanded welfare programs to reach many more households. He also hammered an anticorruption message into voters' minds while managing to shrug off scandals involving those near him with folksy banter.

"One of the biggest questions right now is, who really is Claudia Sheinbaum?"

Sheinbaum has vowed to build on his legacy, always framing his work positively. But AMLO has at times been a confounding leader—one who's expanded the role of the military and the National Guard and poured money into Petróleos Mexicanos (Pemex), the state oil company that's more than $100 billion in debt. He's also turned a deaf ear to protesters calling for an end to a culture of impunity that abets criminality, since murderers and kidnappers are rarely brought to justice.

Given Sheinbaum's prior work on climate and energy, there's anticipation that she could open the door to a greener energy market. During an interview with Bloomberg News in April she spoke of the need to lay out "a vision of decarbonization of the economy." The candidate has outlined more than $13 billion in new projects, including building out solar farms, wind turbines and gas-fueled power plants, but has shown no sign that she would veer away from the current policy of maintaining the state's dominance in energy. And like AMLO, Sheinbaum has been steadfast in her support of Pemex.

Raúl Martínez-Ostos, chief executive officer and chairman of Barclays Plc's Mexico subsidiary, whose team has met with Sheinbaum's, says the presumptive next president "recognizes that she cannot spend what she doesn't have" and consequently will exercise fiscal discipline. "To generate the conditions to implement your projects and your plans, you're going to need to work hand in hand with the private sector," Martínez-Ostos says. "And I believe that will happen much more quickly."

The biggest challenge, "as the polls will tell you, is security," says Antonio Santos, who knows Sheinbaum from their days as student activists and is working for her as a political aide in Chiapas, a state that's recently had an uptick in border-related violence. "She's going to govern in her own style," he says.

López Obrador has his decision to expand the military's footprint as part of his administration's crime-fighting strategy. But government data show that in his time in office there have been more than 170,000 murders, compared with around 135,000 during his predecessor's term.

During her campaign swing through Chiapas in April, a group of people in ski masks flagged down Sheinbaum's silver car on a highway. In an exchange recorded by a reporter present at the scene, members of the civil patrol group told the candidate that armed gangs were an ever-present danger in the area. "When you're in power, remember the mountains and remember the poor people," one said.

Sheinbaum later suggested the incident might have been staged for the benefit of the media, but in the moment she remained inscrutable, leaving them guessing about what she might do to help them. "Thank you," she said curtly, before her car pulled away. —*Maya Averbuch*

THE BOTTOM LINE Sheinbaum, the ruling party candidate in Mexico's presidential race, has been careful not to diverge from the policy positions of the incumbent, who remains highly popular.

FROM LEFT: AUREA DEL ROSARIO/AP PHOTO; ELENA ROSTUNOVA/ALAMY

Is Israel Headed for Another Lost Decade?

● The lesson from history is that the ramp-up in military spending will carry an economic cost, though no one can yet say how high

It was an intelligence failure most of all: Across the security establishment, there had been the conviction that the enemy next door was deterred. Yes, it had been observed carrying out military exercises, but it wouldn't dare attack. Then, as hostile fighters poured into Israel, where soldiers were on home leave for a Jewish holiday, death and destruction mounted rapidly. Israel had to lean on the US for equipment and ammunition. It was a lesson, leaders said, that the country needed to vastly increase military preparedness and spending.

▼ Economists fear war will sap strength from Tel Aviv's economy

That may sound like Israel today as it fights an unforgiving war against Hamas in Gaza. But it's in fact an account of the 1973 Yom Kippur War, when Syrian tanks rumbled across the Golan Heights unimpeded. After 18 days of extremely bloody conflict, Israel spent years recalibrating the balance between defense and development.

What happened then is being viewed by economists as a cautionary tale. The insistence that Israel should never again be caught flat-footed led to a huge ramp-up in defense spending, which averaged almost 29% of gross domestic product in 1973-75. The side effects were devastating. The government deficit blew out to 150% of GDP, fueling 500% annual inflation. The period, known in economic circles as "the lost decade," ended in the 1980s when the country enlisted outside ▶

◀ specialists to help draft tough reforms that slashed state spending, stabilized the shekel and attracted foreign investment.

Israel is a very different country today, but the parallels are haunting. The war in Gaza is the most expensive in the country's history: The central bank has estimated the total cost of the conflict will reach 250 billion shekels ($67.4 billion) through 2025. The fourth quarter of 2023 had a 21.7% annualized drop in economic output.

Defense spending before the war was at an all-time low of 4.5% of GDP. It's set to double this year, says Manuel Trajtenberg, a professor emeritus in the economics department of Tel Aviv University. (By comparison, the ratio is 3.4% for the US and 1.5% for Germany, according to data compiled by the Stockholm International Peace Research Institute.) "The decisive test will be the government's ability to lower the defense-spending-to-GDP ratio back to reasonable levels within several years," he says. "Otherwise, we may slide back into another lost decade."

Some scholars say the Israel of 1973—isolated, poor and with a state-led economy—was so much worse off that the comparison is specious. In the past 15 years, per capita GDP has risen above that of Britain's, France's and Japan's. The number of multinational companies with operations in the country has grown to more than 400, from fewer than 150. David Brodet, a former director-general of the finance ministry, points out that Israel entered the current conflict with a large stock of foreign currency reserves and a comparatively low debt-to-GDP ratio of around 62%.

Still, some experts warn that the country's growth streak—a more than two-decade-long run, interrupted only by the pandemic—is in jeopardy. Perhaps the biggest risk is a reversal in investment flows into the all-important technology sector, if global giants pull up stakes and startups decamp to other locales in search of workers. "We can't even begin to measure how many people have decided not to invest in Israel in the short term, let alone on a permanent basis," says Dan Ben-David, a macroeconomist who runs the Shoresh Institution, a policy research center in Tel Aviv.

"Unlike almost every other war in our history, this isn't going to be a short episode from which we can quickly bounce back," says Gad Yair, a sociologist at the Hebrew University of Jerusalem. "This is going to stretch out for at least two to three years as we figure out how to defend our borders." Besides Hamas, which the US and European Union consider a terrorist organization, Israel faces security threats from Iran-backed militias including Hezbollah in Lebanon and Yemen's Houthis.

Zvi Eckstein, an economics professor at Reichman University, says preserving Israel's success as a technology exporter depends on continued investment in the country's high-quality workforce. Yet it's precisely areas such as education and health, where Israel already lags rich countries in spending, along with transportation and welfare, that will be targeted for spending cuts in the coming years, as policymakers look to free up funds for military upgrades.

The government has made some modest spending cuts and introduced new taxes, but it's mostly relying on much higher bond issuance to cover a widening budget gap—a formula economists call unsustainable.

The budget pressures caused by the war are accentuating the divisions within Israeli society, where the top two deciles of the population contribute 60% of revenue from direct taxes. Those earners are also the core of the military reserve force. When Hamas attacked and about 300,000 reservists rushed into uniform, the tech industry suddenly found itself short of labor, while businesses in and around the Tel Aviv area lost some of their best customers.

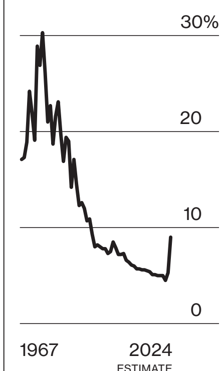
Prime Minister Benjamin Netanyahu is under increasing pressure to cut back some of the billions of shekels in spending he's committed to the ultra-Orthodox and right-wing parties in his coalition government.

A letter to the government signed by scores of economists warns of a "spiral of collapse" in which better-educated, high-earning Israelis choose to emigrate rather than shoulder the burden of supporting the Haredim and their large families. It calls to end public support for schools that don't train students for the modern labor market and for doing away with the draft exemption for the ultra-Orthodox.

Many say it would take an election to force through such changes. (Under parliamentary rules a vote isn't due till 2026, though many Israelis want one earlier.) But though many say that Netanyahu has used up his nine political lives, there's no guarantee that whoever succeeds him as prime minister will be able to govern without the support of right-wing parties. Says Brodet, the former finance ministry official: "If the next government is also dominated by extremists and the ultra-Orthodox, we could be facing not one lost decade but several." *—Galit Altstein and Ethan Bronner*

THE BOTTOM LINE The war in Gaza is the most expensive in Israel's history and threatens to crowd out investment in areas such as education that are vital to the economy's long-term success.

▼ Israel's military expenditure as a share of GDP



DATA: ISRAEL CENTRAL BUREAU OF STATISTICS, STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

Fixing

Pixar

After duds and missteps, the animation studio is looking to *Inside Out 2* to help it recapture the magic

By Thomas Buckley
Illustrations by Sean Dong

Across the bay from San Francisco, some 400 miles up the coast from Walt Disney Co.'s headquarters in Burbank, sits the Steve Jobs Building, an industrial amalgam of glass and red brick that's home to Pixar Animation Studios. Between hula-hoop classes, lengths in the outdoor heated pool, sword-fighting tutorials and seminars on drawing the perfect goose, the workforce of about 1,000 employees who created *Monsters, Inc.*, *Finding Nemo* and *Up* is scrambling to restore Pixar's status as the vanguard of computer animation technology and storytelling.

Starting with its first feature film, *Toy Story*, in 1995, Pixar enjoyed an uninterrupted run for almost three decades as a maker of movies that generated billions of dollars at the box office and won countless awards. Such was the threat from Pixar's success to Disney's animation business that, in 2006, Disney Chief Executive Officer Bob Iger finalized a deal with Jobs, then Pixar's majority owner, to buy the company for $7.4 billion.

It proved to be one of the smartest acquisitions in Hollywood history. Pixar franchises including *The Incredibles* and *Cars* became revenue powerhouses for Disney, driving sales of movie and theme park tickets as well as merchandise. And even as rivals gained on the company—DreamWorks with *Shrek*, Illumination with *Despicable Me*—Pixar occupied a unique position in the American imagination. It was renowned as a pioneer of software breakthroughs that made animation feel more lifelike and as a creative force behind films that expertly bridged childhood and adult concerns about family bonds, the pain of grief and the need to find one's purpose.

That held true until 2018, when Pixar suffered a spectacular downturn. John Lasseter, who directed early hits such as *A Bug's Life* and led much of the studio's success as chief creative officer, was forced to resign under a cloud of sexual misconduct allegations. Then, in the wake of pandemic lockdowns, with people still largely stuck at home, Pixar made three original films—*Soul*, *Luca* and *Turning Red*—available to subscribers on the new Disney+ streaming service instead of holding them for release in theaters. The decision trained audiences to expect Pixar pictures to premiere on their phones and in their homes instead of in cinemas.

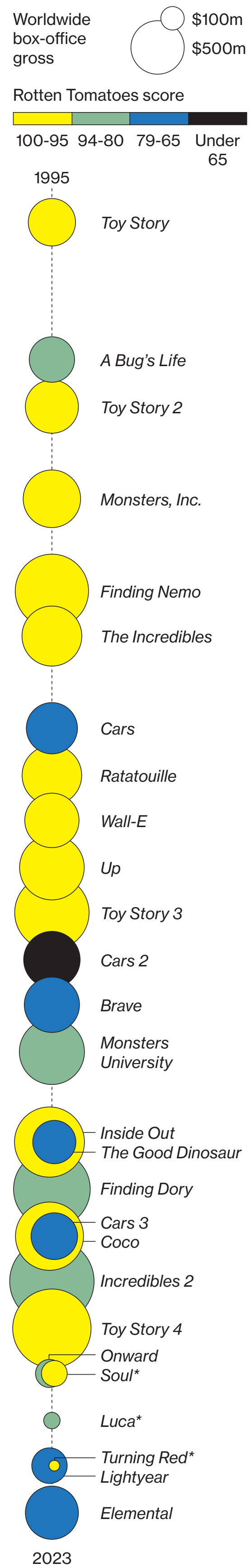
When Pixar finally returned to theaters in 2022 with *Lightyear*, a *Toy Story* spinoff, the film's dour tone failed to impress critics and moviegoers, while a scene with a same-sex kiss resulted in its being banned in most countries with predominantly Muslim populations. In June 2023, Pixar's *Elemental*, a film in which characters embodying fire and water fall in love, opened in cinemas to the worst box-office numbers in the company's history. "We were all kind of gut-punched, and it was tough on morale," says Jim Morris, Pixar's president. "I thought it was a good film with a Pixar feel, so when it didn't work, that was like, 'Whoa.' I was thinking, 'Do people just not want to see the kind of film we make anymore? Is that done?' "

Morris' strategy to turn things around involves balancing original movie ideas with sequels and spinoffs, the better to remind audiences what they once loved about Pixar. Every hit of yesteryear is being considered for a reboot, with *Finding Nemo* and *The Incredibles* regarded as particularly strong candidates for new titles. Morris aims to make three movies every two years—historically it's been closer to one a year—with every other title a sequel or spinoff and the rest standalone concepts or potential seeds for new franchises. On May 21, Morris also announced Pixar's largest restructuring, cutting 175 jobs as the studio refocuses on big-screen films instead of Disney+ projects.

The move comes at a pivotal time for Disney's movie studio, which hasn't turned a profit in the division that includes theatrical film releases since April 2022, in part because of the lackluster performances of *Lightyear* and *Elemental*. Iger returned to lead the world's largest entertainment company in November of that year, after a period of turmoil that saw Florida Governor Ron DeSantis attacking Disney for its opposition to the state's "Don't Say Gay" bill and activist investors casting its business as floundering and lacking appropriate governance. Iger has made fixing Disney's movie output a priority, delaying some titles as far out as 2031 to ensure quality control.

The first major test of Morris' strategy is the release of *Inside Out 2* on June 14. The movie is a sequel to the 2015 coming-of-age film about the personified emotions

Bugs, Toys and a Mixed Bag at the Box Office



PHOTOGRAPH BY CAYCE CLIFFORD FOR BLOOMBERG BUSINESSWEEK. *NOT INITIALLY RELEASED IN THEATERS. DATA: PIXAR, BOX OFFICE MOJO, ROTTEN TOMATOES of Joy, Disgust, Fear, Anger and Sadness, who direct the thoughts and actions of a young girl. *Inside Out* grossed $859 million at the box office and won the Academy Award for best animated feature. Pixar is confident enough in the sequel that it's giving *Inside Out 2* a run of about 100 days in theaters—an extraordinarily generous amount of breathing room in the Age of Streaming, when some films are released in cinemas and online simultaneously. Pixar is also releasing a television series based on *Inside Out*.

If families show up for *Inside Out 2* in the kinds of numbers Pixar used to see, it will reaffirm the studio's standing. But if the movie fails, it will fuel concerns about the company's relevance in an increasingly crowded animation industry and call into question whether its next films—*Elio* in 2025 and *Toy Story 5* in 2026—are just more bets in the wrong direction. Fittingly, Pixar is introducing a new personified emotion in *Inside Out 2*: Anxiety.

Morris

"With a sequel, if you put something out there that doesn't have the goods, then you will be punished for it," Morris says. "Having had the doldrums we did, it will certainly be a good test with *Inside Out 2* for us to see: Does this stuff still work, or does it not?"

Pixar started in 1974 when Alexander Schure, who'd founded the New York Institute of Technology and owned a traditional animation studio, recruited computer scientists including Ed Catmull, who shared his ambition to create the world's first computer-animated movie. In 1979, Lucasfilm, flush with cash from *Star Wars*, hired those scientists to form a subsidiary called the Graphics Group, renaming it Pixar a few years later. It came to own hundreds of patents related to digital-image composition.

Jobs, the co-founder of Apple Inc., acquired Pixar in 1986 and agreed to a distribution deal with Disney for its films, all of which from the late nineties through the late aughts became blockbusters. Iger persuaded Disney's board to acquire Pixar to right its animation business after the failure of titles such as *Fantasia 2000*, *The Emperor's New Groove*, *Treasure Planet* and *Piglet's Big Movie*. A half-hour before the deal was announced, Jobs gave Iger a chance to back out, saying his pancreatic cancer had returned and was likely to be terminal. Iger proceeded nonetheless.

Over the years, Pixar's films have grossed more than $15 billion at the box office and won 23 Oscars, 11 Golden Globes and 11 Grammys. Catmull, who served as president of both Pixar and Disney's animation business for more than a decade following the acquisition, outlined the steps to make a great Pixar movie in his 2014 book, *Creativity, Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration*.

First, hire great people, because great people will come up with great ideas. One such idea was an animation program called Fizt, which Pixar developed for *Monsters, Inc.* to bring the genial horned mammal Sulley to life. The software determined how the 3 million individual strands of hair in his speckled blue fur moved in the wind or rain. Another program, Transblurrency, accurately rendered how sunlight passed through water and jellyfish in *Finding Nemo*. Great employees were why Pixar rarely had to source a script from anyone who wasn't already a colleague and why directors of its later films had typically climbed the ranks working on earlier ones.

Second, Catmull wrote, be candid, because candor produces great results. Pixar has a team of directors it calls the brain trust, which has no editing control over a fellow director's movie but provides feedback on first cuts. The brain trust hated the character of Woody, voiced by Tom Hanks, in the first iterations of *Toy Story*, because he was a jerk. It took dozens of alterations to transform him into one of Pixar's most treasured protagonists.

Third, embrace failure, because failure is a learning opportunity that leads to better ideas. Pixar has shut down several projects it was developing, Catmull wrote, without specifying which ones, because the films didn't meet the company's standards.

Pixar's early successes led to rivals quickly replicating its animation technology and storytelling methods. In 1998, DreamWorks—founded by former Disney film studio chief Jeffrey Katzenberg, director Steven Spielberg and music mogul David Geffen—released its first animated film, *Antz*, about a worker ant who falls in love with the colony's princess. DreamWorks had paid its animators bonuses to work overtime so it could release the picture six weeks before Pixar's *A Bug's Life*, also about a worker ant who falls in love with the colony's princess. (Pixar claimed Katzenberg stole the idea; Katzenberg denied it.) ▶

◀ That seeded an ongoing battle for family dollars between Pixar and DreamWorks, which developed the popular *Shrek*, *Madagascar* and *Kung Fu Panda* filmographies. In 2016, DreamWorks was acquired by Universal Pictures parent Comcast Corp., as it sought to challenge Disney more directly on screen and at its Universal Studios theme parks. Universal also finances and distributes the films of Illumination—founded in 2007 by *Ice Age* producer Chris Meledandri—which has developed multibillion-dollar franchises including *Despicable Me* and *The Secret Life of Pets*. Meledandri has also had success adapting long-beloved brands for the big screen, notably with *The Super Mario Bros. Movie*; the joint Universal and Nintendo Co. release brought in almost $1.4 billion in 2023. It was the second-highest-grossing film of the year after *Barbie*, and it had close to three times the ticket sales of Pixar's *Elemental*.

"The world is more crowded. There's just so much out there, and it's harder and harder to surprise people," says Pete Docter, the director of *Monsters, Inc.*, *Up*, *Inside Out* and *Soul* and Pixar's chief creative officer since he replaced Lasseter in 2018. "That means we have to work harder."

As Pixar's competition thrived, the company saw a brain drain at the brain trust. Following the allegations of misconduct, Lasseter, who'd either directed or produced all of Pixar's biggest hits, took a six-month leave of absence, then left to join Skydance Media LLC as head of animation. (In an email to Pixar employees announcing his departure, Lasseter apologized for "missteps" that made some staff members feel "disrespected or uncomfortable.") Brad Bird, director of *The Incredibles* and *Ratatouille*, left in 2019. Lee Unkrich, who directed the critical and commercial sensation *Coco*, and Catmull also left that year.

Along the way, a change in Disney's priorities, which saw the company racing to feed its nascent Disney+ streaming service, spread animators thin. Its decision to release Pixar films on the platform instead of in cinemas robbed the company of the prestige and pageantry that had accompanied its big-screen debuts for more than 25 years. And a wider restructuring under Iger's predecessor, Bob Chapek, centralized budgetary and distribution decisions in Burbank, with Pixar's artists and managers having no clue whether their movies were bound for a theater or an app, let alone a say in the decision.

Although many studios rushed to release movies online during the pandemic, those that held back were later rewarded. The premiere of *Top Gun: Maverick* was serially delayed from 2019 until 2022, when it grossed $1.5 billion worldwide, Paramount Pictures' second-best box-office performance ever, after *Titanic*. When Disney, striving to emulate Netflix Inc.'s business model (and valuation), threw *Soul*, *Luca* and *Turning Red* straight onto its subscription service, it "felt a little like a death," Docter says.


Docter

After *Lightyear* lost millions of dollars in 2022 and *Elemental* had Pixar's worst-ever opening-weekend performance the following year, "there was a real and intense period of self-scrutiny and feeling like we messed up in some way," Docter says. Executives hosted postmortems to determine how to revitalize the studio, he recalls. They arrived at mentoring Pixar's upcoming directors to focus less on autobiographical tales—*Luca* had been inspired by its director's childhood in Italy; *Turning Red*, by its director's relationship with her mother; and *Elemental* (which did gain some momentum overseas and online), by its director's immigrant family. Pixar would instead develop concepts with clear mass appeal, many of which—in the case of sequels and spinoffs—had already been proven.

The studio's movies should be less a pursuit of any director's catharsis and instead speak to a commonality of experience, Docter says. "I don't think we can ever let ourselves off the hook of making sure that we deliver the best possible and most relatable films."

In retreading characters and plotlines that have worked for Pixar in the past, the studio is breaking from a strategy, formulated about a decade ago, of favoring new ideas. Five of Pixar's last six movies were based on original concepts. Its first film of 2024 was also going to be an original: *Elio*, directed by *Coco* writer Adrian Molina, about a boy who becomes Earth's intergalactic ambassador. But when the writers' and actors' strikes last year forced Disney to push back *Elio*'s release to 2025, Pixar's chances of a blockbuster comeback came to rest instead on *Inside Out 2*, which was much further along.

"It may have been serendipitous for us that it worked out that way," Morris says. "*Elio* seems like it's a good film, but with *Inside Out 2*, at least we'll get to see if a dyed-in-the-wool Pixar film with known intellectual property still works."

In one sense, sequels and spinoffs are harder to get right, Morris says, because

PHOTOGRAPHS BY CAYCE CLIFFORD FOR BLOOMBERG BUSINESSWEEK the studio is reengaging a protective fan base that will judge new titles against the originals. *Toy Story* got three wildly successful and well-reviewed sequels, but *Lightyear* proved that the franchise's relationship with audiences can be fickle. Executives maintain that if a new installment stays faithful to the storytelling that made earlier titles work, it should draw those fans back.

Pixar's campus

When Pixar determined it needed to return to its roots in 2022, it appointed Lindsey Collins to be senior vice president for development. Part of her job was to help Morris and Docter establish which Pixar stories were worth revisiting. Collins, who's been at the company since 1997 and produced award-winning titles such as *Wall-E*, is advising on development for movies to be released in 2027 and beyond. That means her projects are, for now, commercially sensitive secrets, though she sometimes runs hypotheticals by her teenage children. Her son, Cash, reminds her that sequels shouldn't feel opportunistic. "The other day, I was like, 'What if I told you we were making an *Incredibles 3*?' " Collins says. "And he was like, 'Money grab.' And I was like, 'F---.' Sequels are a double-edged sword, because the audience can be brutal and so quick to judge. Unless they're worthy."

Shortly after Collins stepped into her role, Pixar announced it was making *Inside Out 2*. When Docter conceived the original, he didn't consider stretching its story beyond one film. *Inside Out* was based on his experiences with his daughter, who inspired Riley, the 11-year-old whose mind is governed by five anthropomorphized emotions. He reconsidered after *Inside Out* grossed almost $1 billion and won the Oscar for best animated feature. Kelsey Mann, who'd worked as a story supervisor on Pixar's *Monsters University*, *The Good Dinosaur* and *Onward*, pitched Docter on a follow-up about a teenage Riley, inspired by Mann's experiences with his own daughter.

Mann's first screening for the brain trust counted nine new anthropomorphized emotions, including Schadenfreude, Guilt and Jealousy. On the advice of colleagues and with the waywardly sullen tone of *Lightyear* in mind, he culled the number of main new emotions to four and focused on their potential for levity to complement Pixar's characteristic earnestness. *Inside Out 2* will feature Anxiety, depicted carrying baggage; Envy, sparkle-eyed and obsessed with others; Embarrassment, replete with sweaty palms and a plumber's crack; and Ennui, a perpetually bored, French-accented couch potato.

Expectations are as high as they've ever been for a Pixar title: When the first trailer was released online in November, it got 157 million views in 24 hours—surpassing *Frozen II* as the most for a Disney animated movie. At the top end of estimates, industry tracker *Boxoffice Pro* forecasts that *Inside Out 2* could be the first picture of 2024 to gross more than $100 million on its opening weekend in the US and Canada. (*Dune: Part Two*'s $82.5 million opening is the biggest of the year to date.) Docter also sees great potential in a return to *Finding Nemo*; that film and its sequel, *Finding Dory*, together grossed close to $2 billion. "Where else have we not gone in the ocean? The ocean's a big place. I think there's a lot of opportunity there. We're kind of fishing around—ha-ha," Docter says. If *Inside Out 2* works, it could lead to a theatrical release model that buttresses Pixar's original films, such as an undisclosed project from *Turning Red* director Domee Shi, who was recently elevated to the brain trust.

Even as Pixar returns to its emphasis on theaters, the company has been doing its part for Disney+ by developing series based on original and existing ideas. Later this year it will release *Win or Lose*. Each of its eight episodes focuses on a different character associated with a middle school softball team. *Dream Productions*, set in the *Inside Out* universe of Riley's dreams, will air next year. (As part of its restructuring, Pixar will see how these shows perform before committing to more titles for the streaming service.) "I hope that we will not release another feature film on Disney+," Morris says. "If we do more stuff for Disney+, it should be a series, and then that makes a clean demarcation between what we do for theaters and what we do for streaming."

In the run-up to *Inside Out 2*, Pixar gave *Soul*, *Luca* and *Turning Red* short releases in cinemas, hoping to rebuild the connection between Pixar and moviegoers. This April about 35 minutes of *Inside Out 2* was privately screened in Las Vegas to executives of the world's largest theater chains. Some attendees said the story and visuals suggested it could be the best Pixar film in a decade.

In one scene, an emotion, Nostalgia, makes a cameo when she attempts to enter the conversation but is turned away because she appears too early on in Riley's development. It unwittingly reflects Morris' view of Pixar as a whole: There's no point feeling nostalgic about an earlier era if the studio's best pictures are yet to come. "There's a flavor of film that we make that's a little bit unique. They're small stories written on a large canvas, and when they're at their best, they've given the audience something to laugh about, cry about and think about a little bit," he says. "I'm optimistic that *Inside Out 2* will tell us that there is still a place for those kinds of films." Ⓑ

A fisherman brings a delicious nightmare into the Norway King Crab factory in Bugøynes

THE CRAB KINGS

How Stalin, Putin and climate change turned Norway's most desperate village into a global seafood capital

By Andrew S. Lewis Photographs by Thomas Ekström

This story was produced with support from the Pulitzer Center in collaboration with the Food & Environment Reporting Network, a nonprofit investigative news organization.

Near the end of 1991, the residents of Bugøynes, then a village of about 300 people in Norway's Arctic north, ran an ad in the national newspaper *Dagbladet*, begging somebody to relocate them en masse. Cod and other whitefish, once Bugøynes' bread and butter, were disappearing, and no one was quite sure why. The hamlet's only fish plant had closed years earlier. The local fishing industry had essentially collapsed, leaving the villagers near the Russian border stuck with few ways to earn a living. "The time has come," their ad read, "to put everything behind us and start again somewhere else."

One cold afternoon this past February, Leif Ingilæ rolls a cigarette and laughs hoarsely as he recalls the results. "We got offers from French vineyards to move all the residents there to pick grapes," he says. "But we figured if everyone goes, we would all become alcoholics." Mostly, the younger generation moved south in search of work, while the lifers survived on unemployment benefits. Ingilæ, whose family goes back generations in Bugøynes, first went to sea in 1967, when he was 15 years old. When the newspaper ad ran, it seemed his time in the area was up; his boat was one of just three anchored in Bugøynes' harbor. Still, he stayed. A year later, on a routine fishing trip in Varangerfjord—the wide, clear fjord that links Bugøynes to the Barents Sea—he found in his gill net a huge, strange crab.

Its claws were exceptionally muscular, its six legs studded with spikes, its mouth wreathed with tiny "jaw legs" reminiscent of the Predator. Scores more, some pushing 25 pounds and with leg spans beyond 5 feet, started appearing in other people's nets. The community quickly learned that the crabs' powerful limbs could wreak havoc on fishing gear—tangling or tearing nets, stealing bait from longlines—and that the creatures could devour most any small marine life in their path. They seemed to be vacuuming the sea clean of the food sources many whitefish species need to survive, including bivalves, sea stars, even larvae.

"We hated them," Ingilæ says. He called Norway's Institute of Marine Research (IMR), which identified the interloper as *Paralithodes camtschaticus*, the Kamchatka red king crab. It was an invasive species from Alaska, one that Soviet researchers had brought to Russia's side of the Barents Sea decades earlier. It also happened to be a delicacy, worth billions of dollars a year.

The crab's popularity with wealthy diners started to change things for Bugøynes. Its numbers would need to be controlled to prevent it from spreading west and chewing up Norway's primary fish stocks, but for the locals here, perhaps it could take the place of the old cash crops. The Norwegian government established an experimental crab fishery in the region in 1994 and permitted commercial fishing of the species about a decade later. The desperate village, as well as others in the region, began to eke out a living catching crab instead of fish, alongside a much bigger Russian industry. In the meantime the original stocks of the crab in Alaska collapsed. An ▶

◀ Alaskan fishery had harvested them aggressively while water temperatures rose beyond what the species could take.

By 2022, Russia controlled 94% of the multibillion-dollar global market. That was until Vladimir Putin invaded Ukraine that February and the US, along with many of its allies, banned the import of Russian seafood. In the weeks before the ban took effect, some importers raced to pack their warehouses with frozen legs and claws. California-based Arctic Seafoods Inc. paid more than $300 million for a massive order of Russian crab, about 6.5 million pounds. It was also swindled out of 6,000 pounds of that haul, according to an indictment against a Florida man who allegedly fooled the company by posing as a buyer for Safeway. (Arctic Seafoods didn't respond to requests for comment.)

As it turned out, most major US and allied retailers immediately pulled all

"I think it will be four or five years before the bigger crabs return"

Russian seafood from their shelves. Red king crab can be kept frozen for as long as two years, but the negative publicity didn't seem worth it. A historical accident at the intersection of geopolitics and climate change had left only one place able to sate American appetites for the stuff: Ingilæ's backyard.

Sitting with legs crossed in the cabin of the same stout 36-foot trawler he's owned for four decades, Ingilæ leans the elbow of his smoking hand on a dinette table. He's wearing a traditional Norwegian wool sweater, a gray beanie and black-framed glasses. His face is as creased and ruddy as you'd expect from someone who's spent a lifetime at sea. Across the harbor, boats line up at the dock of the old fish plant, now home to the exporter Norway King Crab. In the early years of catching the crabs, Ingilæ recalls, he was paid less than 5% of today's going rate. This particular morning, Norway King Crab is offering an all-time high of $27 a pound. It's selling the catch for close to double that price.

Now, Ingilæ's boat is one of 917 in the area. While Russia is still catching vastly more red king crab (a quota of 28 million pounds last year) than Norway, the latter exported just about all its haul of 5.4 million pounds in 2023, a 43% annual increase worth $115 million. At Norwegian prices, US importers want the crabs alive, because ultrahigh-end restaurants can get far more for them that way. "We have places that will charge $900, $1,000," says Roman Tkachenko, chief executive officer of Direct Source Seafood LLC in Washington state. "The days of buying [frozen] king crab at 35 bucks and selling it at retail for 45, they're gone."

In Bugøynes there's no longer talk of a mass exodus. Its fishermen, including Ingilæ, describe a comfortable life complete with annual vacations to the Mediterranean or the Caribbean. Whatever doesn't get exported forms the backbone of a growing crab-themed tourism industry. For Ingilæ the turnaround has yielded a rare sight among fishing towns everywhere these days: Both his son and grandson work on his boat. Today his younger peers can scarcely imagine a time without the crabs. There are, however, some signs that they might have to.

A woman with a red king crab in Kodiak, Alaska, circa 1970s

WIEN COLLECTION/ANCHORAGE MUSEUM

In just three decades, the crabs have gone from scourge to savior. They still need to be managed as an invasive species, but now that they've become a pillar of the regional economy, the Norwegian government needs to take care to sustain them, too. Last year, after the IMR discovered a significant decrease in the weight of adult male crabs, the government cut the 2024 quota by almost 60% and ordered a two-month pause in fishing from March to May. A generation too young to remember the *Dagbladet* ad is getting a taste of the fear Ingilæ remembers well.

Ingilæ with his fishing boat, the *Eskil*

In 1959 the Soviet Union's aptly Brutalist-sounding Central Commercial Department for Acclimatization tasked a biologist named Yuri Orlov with resuscitating an up-to-that-point unsuccessful program, started in 1930 under Josef Stalin, to develop a red king crab fishery in Russian waters. In 1960, Orlov and his team plucked nine females from the waters around the Kamchatka Peninsula, which forms the western edge of the Bering Sea, and placed them in small plexiglass boxes filled with seawater and chilled with ice. The crabs were loaded onto a military transport plane and flown across Eurasia to Murmansk, not far from the Norwegian border. From 1960 to 1969, Orlov oversaw the release of about 2,500 adult crabs, 10,000 juveniles and 1.5 million larvae into a fjord that connects Murmansk to the Barents Sea. By the '90s this Red Army of crabs had established itself in Varangerfjord, just off the shore of Bugøynes.

At first everyone blamed the cod decline on the red king crab. "People didn't need a scientist to convince them," says Norway King Crab's CEO, Svein Ruud. "Cod was going out. King crab was coming in." The damage the crab caused to fishing gear was an obvious problem and remains so today. Now, though, the evidence is a bit more mixed, as Ruud and the fishermen are eager to stress. Research has indeed shown that mollusks, mussels and scallops disappear from areas of seafloor where there are large concentrations of red king crab, as do small forage fish that are a critical food source for cod. Then again, red king crab are voracious eaters of sea urchin, which had decimated the kelp forests vital to maintaining the area's ecosystems.

What seems certain is that the crab isn't done expanding its territory. "All indications suggest that this invasive species will spread further north in the Barents Sea, as well as southwards along the coast of Norway," IMR researchers Lis Lindal Jørgensen and Einar Nilssen wrote in 2011. Melina Kourantidou, an assistant professor at the University of Southern Denmark who's studied the economic impacts of the red king crab in the Barents Sea, says the species' range could be further amplified by shipping, via ballast water, as vessels increasingly travel once-frozen routes through the Arctic Ocean. "There's a lot of concern in the maritime community about invasive species in the Arctic," Kourantidou says.

To slow the population's expansion into other valuable fishing waters, the government allows unlimited crabbing anywhere near the lucrative whitefish stocks of the west coast, home to one of the largest cod fisheries in the world. Still, only residents of Bugøynes' home county, Finnmark, can obtain commercial licenses to catch and sell the red king crab, a restriction the Norwegian government hopes will keep the species both sustainable and contained to the north. Norway King Crab set up shop in Bugøynes in 2007, Ruud says, because there was a lot of shuttered fishing infrastructure in Finnmark that could be repurposed, including the fish factory. "We had all these old buildings with no activity," he says. "By then, I had seen live king crabs sold at a very high price in places around the world, so I said, 'Let's do that here.' "

On a windy, unseasonably warm morning in Bugøynes, Ruud and his chief operating officer, Jørn Malinen, walk through the vast holding area of Norway King Crab, where they keep the catch they buy for a couple of weeks to make sure the crabs are in shape for shipping. Sixty-one tanks, some as large ▶

A fishing vessel making its way back to the Norway King Crab factory

The village of Bugøynes

◀ as 580 gallons, whir with oxygenated water kept in the red king crab's ideal temperature range of 35F to 53F. To the crabs, Malinen says, "they're more or less Jacuzzis." It's also a bit of a cleanse. Red king crabs can be safely held in tanks for about a month without food. After a weekslong soak in the filtered seawater while fasting, the crustaceans, Rudd says, "shit out" any impurities. Then they're loaded into portable tanks, trucked to Oslo Airport and flown overnight to Hong Kong, Dubai, Las Vegas and other cities around the world. Some of the tanks hold 550 pounds of crab, which will sell for about $100,000 in the fanciest restaurants.

With the same T-bar gun you'd find at the Gap, each crab's shell is tagged with a unique QR code that links to a web page showing its weight, the day it was caught, the name of the person who caught it, more info about their boat and a 90-second video featuring wintry Norwegian scenery. This is partly an assurance that the crab in question isn't one of the millions still being shipped from Russia to China, Japan (which has imposed higher tariffs on Russian goods rather than banning them) or elsewhere. It's also superb marketing for the kind of diners who want to pick out their crabs from a restaurant's tank. Phil Campbell, formerly the executive chef at Klaw, a Miami restaurant that built its own 4,000-gallon tank system to hold live red king crab, says customers paying $11 an ounce are hungry for every detail. Some, he says, take the tags home with them.

At port, a crane operator hoists a crab catch onto shore for transport to the factory

Compared with the fleets of Russian "factory ships" that stretch almost 200 feet, Norway's crab boats are tiny, topping out at 40 feet, and are usually crewed by one or two people. While this puts a ceiling on how much a captain can bring in, it also means they're not splitting the haul many ways. Erling Haugan, who has a degree in online marketing, came to Bugøynes in 2007 because Norway King Crab hired him to help in the office, but he soon grew convinced that "the fishermen were having better days than me." With zero experience, Haugan bought his own boat, quit his job and started crabbing. He recently purchased a second boat for $230,000 and says, if he were to sell it today, it would fetch more than $350,000. "The income from fishing is good," he says. "But I'm a little bit worried, because it's not good for the environment when you're taking too much."

Other fishermen in Bugøynes and elsewhere in Finnmark are selling their catch not to Norway King Crab but to tourists. For $155, one local company offers "king crab safaris" consisting of a short boat ride to smaller pots that are hauled up and opened for customers, who can reach inside and retrieve the surprisingly docile crabs themselves. Afterward the tourists are whisked off to a nearby sauna while a cook prepares their catch. At the Snowhotel, where $658 will get you one night in a claustrophobic room made of ice, guests can pay an additional $244 for a safari on a nearby fjord, where pots are surreptitiously stocked with live crabs trucked in from Bugøynes and other towns each morning. Although there's a population of wild crab in the fjord, there isn't enough to satisfy the number of safari guests, says Snowhotel's king crab manager, Sten-Roger Seipæjærvi, who estimates that a record 20,000 guests booked the tour this winter. "In this fjord we cannot get what we need," he says, "so of course we have to fill up the pots."

A bit of a rivalry between Norway's $17 billion tourism industry and the

fishing boats has grown as crab quotas have tightened. Tourism boosters say every live experience they sell to a visitor creates more jobs and yields far more money for the community. Fishermen grumble that the tourism industry wasn't slapped with the same two-month pause as the boats selling to Norway King Crab. "This is stupid," Haugan says. "It's the same crab, and tourism is making the same problems."

Neither group likes to talk about the cautionary tale of Alaska. At its peak in 1966, the US state's fishery produced 90 million pounds of red king crab, which, as a species native to that area, didn't cause similar invasive devastation. Although they haven't completely disappeared from the Alaska area (and there remains a small export business in the seas around Japan), their recovery has been hindered by significant increases in water temperatures. Norway's crabs are at risk of a similar outcome. According to a 2018 study by IMR scientists, temperatures throughout the Barents Sea's water column have sharply increased since the mid-2000s, largely because of retreating sea ice. Rising atmospheric carbon dioxide also means acidification, which has been shown to have an impact on red king crab larvae and molting cycles.

Local officials have found a more convenient villain in the black market. In 2019, Norwegian police uncovered a criminal network that was illegally catching and smuggling almost 100,000 pounds of red king crab worth millions. In 2022 customs officials seized 2,000 pounds of legs and claws from two vehicles stopped on a highway outside Oslo. "When you have a product that is worth so much, that's very enticing for some people," says Magnus Mæland, the mayor of Kirkenes, the nearest city to Bugøynes. "Just search Facebook for a little while, and you'll find people from the south asking, 'Can you fix me some king crab?'" Mæland isn't alone in speculating that crooks might be at least partly responsible for last year's decrease in red king crab biomass.

The years of intensive legal fishing haven't helped, however. Nor have the water temperatures, which, according to one study of the northern Barents Sea, have been warming 1.2C to 2C per decade since the 1980s. In 2022, Norwegian and Russian scientists warned in a joint study that the recent warming in the area had been unprecedented, albeit less dramatic than in parts of Alaska.

Tourists head out to retrieve their own crabs

In Bugøynes, quotas are almost always the subject du jour. They've created and destroyed fortunes, as well as made the difference between kids' leaving for the cities or staying home. While the village's new status quo feels less fixed than it did a year ago, locals are still talking in whens, not ifs. "I think it will be four or five years before the bigger crabs return," Ingilæ says. In the meantime the highest-end restaurants with the wealthiest customers still want to believe the seafood they eat is as sustainable as is possible in a world where humans consume 344 billion pounds of fish and shellfish each year.

As the Barents Sea continues to warm, and the war in Ukraine rages on, demand for Norwegian live crab is likely to intensify in the US. Should the conflict end and the ban be lifted, Direct Source Seafood's Tkachenko says, there's no doubt American customers will want Russian crab again. The bigger question, he says, "is if there's going to be anything left." Instead of being hurt by the ban, Tkachenko says, Russia has simply turned to China, which is buying enormous volumes of live crab.

Campbell, formerly of Klaw, envisions a distribution hub somewhere in the US with a whole warehouse full of the crab Jacuzzis. Norway King Crab's Ruud aims to ship crab at much higher volumes by sea, loading them into the same portable tanks he uses for his Oslo-bound trucks. On the unseasonably warm winter day when he gives a tour of the tanks, Ruud later entertains a group of seafood purveyors, restaurateurs and chefs from Michelin-starred eateries in Zurich. Having taken a crab safari, including a stop at the sauna and a dip in the 36F fjord, the Swiss group enjoys the catch, steamed in seawater, at an ultra-modern Nordic-style home right next to Norway King Crab. Much of the home's bottom floor is a test kitchen, built for high-profile visits like this.

Across the harbor, a south wind coming off the mountains rocks Bugøynes' fishing boats in their slips. Nearby, a new dock with room for 16 more vessels sits empty. It was built on the high of 2023's record quota but before the 2024 cut. As Ruud's Swiss guests begin cracking into the pure-white, salty-sweet meat of their catch—a dinner easily worth thousands of dollars—a local pianist arrives to play Nobuyuki Tsujii compositions and other classical standards. "If you're still hungry, don't worry," Ruud tells his guests while they eat. "There is plenty more crab." Ⓑ

Shooting the

▲ Astro Teller in the lab at Alphabet's X

g for Earth

Alphabet is ending an era of unrestrained invention, spinning off many projects into independent startups

By Julia Love

Photograph by Cayce Clifford

If there were an aptitude test to qualify for a job at X, Alphabet Inc.'s renowned research lab, Kathryn Zealand would ace it. She's a McKinsey & Co.-trained entrepreneur who abandoned a Ph.D. in theoretical physics to build startups in sub-Saharan Africa. In her spare time, she climbs California's tallest mountains while bingeing sci-fi audiobooks. She joined X in 2018, and for the past five years she's dedicated her life to building an exoskeleton.

On a recent afternoon in San Francisco, Zealand donned a prototype of her product, a mechanical system designed to enhance a person's musculoskeletal abilities. This early version is a belt studded with wires, actuators and sensors that's not particularly fashionable.

There aren't many companies out there making exoskeletons, but the few that do mostly target warehouse or factory workers at risk of injury or in need of a boost to lift heavy objects. Zealand is developing a pair of battery-powered trousers to assist people who struggle with mobility. It's a noble aim and a devilishly difficult design challenge. The device must be lightweight, powerful and stylish enough that people will wear it in public. The prototype is sufficiently light and comfortable, but Zealand is struggling to perfect the fit; the belt gapes at her hips. "A prototype is always built to answer a question," she says.

The main question she's trying to answer is whether she can finally realize her vision for the product outside of Alphabet. Last year she and a small team left X's lab and established an independent startup. They traded a world-class design studio, generous compensation and the prestige of the Google brand for autonomy. The exoskeleton "is almost like a great project for X 10 years ago," Zealand says. "But by the time we got around to solving all the details, we were less on-brand."

Alphabet's self-proclaimed moonshot factory is coming back down to Earth. From its founding in 2010, the lab captured the public's imagination with visions of a techno-utopian world it would help invent. In the not-so-distant future, X posited, everyday people might ride to work in a self-driving car (Waymo) and socialize with a powerful computer resting on the bridge of their nose (Google Glass). The most whimsical idea was at Project Loon: A network of high-altitude balloons would beam internet to remote locales, creating educational and economic opportunities for previously disconnected communities.

The leaders of the lab readily acknowledged that many of these efforts would not pan out. Yet Google's willingness to invest in speculative technology sent a powerful message to Wall Street and Silicon Valley, echoing a defiant letter penned by co-founders Larry Page and Sergey Brin when the company went public. ("Google is not a conventional company. We do not intend to become one.") X's formation signaled that, even while the namesake business was still growing rapidly, Page and Brin had set their sights on hatching the next Google and solving some of humanity's thorniest problems.

X enjoyed a privileged place in Mountain View, California, for years, and Brin regularly worked from an office there. But former employees say Google has become less a hothouse of innovation than a cautious custodian of its search empire, which appears to be increasingly under threat. OpenAI's ChatGPT unleashed a new class of software that can succinctly answer questions and perhaps obviate the need to search on Google. This prospect set off a panic at Google's headquarters that has transformed the company. When Brin turns up at work now, he's more likely to be writing code for Google's AI projects, far from the Xplex, say people with knowledge of the matter.

To sharpen its focus—a phrase Alphabet Chief Financial Officer Ruth Porat and Chief Executive Officer Sundar Pichai often use on earnings calls—the company began reining in cushy corporate perks and conducting rolling layoffs. Google's beloved 20% time, in which employees can devote one day a week to passion projects, is technically still on the books, but rank-and-file employees say they have little freedom to indulge in it. With the exception of artificial intelligence, a natural complement to the core business, "I do get a strong sense that Google has long since given up on breaking new ground," says one person, who, like many of the more than two dozen current or former employees interviewed for this story, requested anonymity for fear of being fired or facing other professional repercussions. "They're pretty much just turning the crank."

Top executives seem to see the idea of launching internet balloons into the stratosphere as an unjustifiable expense when the core business could be in peril. But the uncomfortable truth is that ChatGPT was built on a discovery that came partly out of work at X, when AI still sounded like sci-fi. As Alphabet became frozen with fear, OpenAI emerged as an innovation hub, with a research-driven culture instilled by former Googlers. But OpenAI, as its name implies, is only focused on AI. The era of freewheeling invention lavishly funded by a tech giant that X embodied is largely gone. Amazon is culling dozens of projects, Apple gave up on building a car, and Meta shut down some of its hardware efforts. These days, when people talk about X, they're usually referring to Twitter under Elon Musk.

As for Alphabet's X, one of the primary goals for projects had always been to earn their place as a standalone business unit of the parent company. (This is partly why Google changed its name to Alphabet in the first place—a company for every letter.) But that process is on hold for at least the next year, say two people with knowledge of the matter. Instead, X is carving out a path in which projects can spin off as startups, like Zealand's did.

It's the result of years of debate and experimentation between X and its corporate overlords, current and former employees tell *Bloomberg Businessweek*. The company was initially reluctant to let outsiders share the fruits of its investments or risk compromising intellectual property, including code that often relied on the work of other teams at Alphabet. But executives ultimately decided it was better than letting promising technology wither on the vine.


▲ Zealand with the startup's first functional prototype

▲ Testing out the exoskeleton

"X was created as a 'Moonshot Factory' to create new technologies to solve complex problems," Porat wrote in an emailed statement. "We are excited that X leadership is increasingly pursuing opportunities to scale and monetize many of those innovations to deliver sustainable value creation."

While the new policy opens up more possibilities, it also signals that Alphabet will be shutting off its spigot of cash to more mature projects that haven't proven themselves financially viable. X's budget this year is less than what it was last year, and employees worry about what that means for next year. Some former X employees say the pivot to startup incubation represents a hollowing out of the lab and a retreat from its central purpose of jump-starting the next Google.

Astro Teller, who's been running X for more than a decade, downplays the significance of the shift. A futurist who reports to work on Rollerblades, Teller says that from X's earliest days, the lab has been trying to balance efficiency with innovation. He believes so deeply in the lab's model, he says, that he doesn't have to worry too much about the prospects of any one project.

"We're hardly perfect. We're in the middle of our journey somewhere," Teller says. "But we're enough better than random that I sleep well at night."

Some of Silicon Valley's biggest breakthroughs came from a company that made copy machines. Xerox's research-and-development lab in Palo Alto invented ethernet, the graphical user interface and other pillars of personal computing. But Xerox PARC failed to commercialize most of the technologies, allowing Steve Jobs and others to do so first. The rise of Apple Inc. and fall of Xerox Corp. became a parable about big companies failing to recognize the value of their own inventions.

From Google's early days, Page and Brin made a point of funneling profits from their search engine into businesses that had nothing to do with it. Out of this effort came Gmail and Google News. They institutionalized this philosophy with X and tapped Sebastian Thrun to head it. A leading robotics engineer and Stanford University professor, Thrun studied the legacies of some of the most famous corporate research labs to define X's key tenets: hire the best minds, set audacious goals, dole out bonuses.

Notably absent from these principles was any spirit of fiscal discipline. If Thrun had a budget, he was only vaguely aware of it. He gave his deputies as much money as they requested, and his only ask was that they not spend it all that year. Thrun reasoned this would inspire restraint, he says, in the same way that employees with unlimited vacation take fewer days off. The sort of efficiency he was more concerned with involved scolding teams that had too many meetings. "The culture we set up was one of complete trust," Thrun says. "I would do whatever it took to make these teams successful. If they were doing great, they would not see me at all."

One of the first teams at X, led by another Stanford professor, Andrew Ng, sought to build early AI software inspired by the architecture of the human brain. X gave him the ability to operate at the speed of a startup while drawing from Google's deep well of talent, Ng says. The parent company eventually snapped up the project, called Brain, and made it a cornerstone of Google's AI efforts, but the time at X was formative, says Ng, who's now on the board of Amazon.com Inc.: "I give Google X a ton of credit."

Thrun's right-hand man at X was Teller, a scholar-turned-novelist-turned-entrepreneur on wheels. His given name is Eric, but everyone calls him Astro, a nickname he acquired in high school when friends said his hair reminded them of Astroturf. His family tree includes a Nobel Prize winner, a philosopher and a complicated historic figure: his grandfather, Edward, the creator of the hydrogen bomb. In a 2018 interview with the Atomic Heritage Foundation, Teller drew parallels between his work at X and the development of ▶

GABRIELA HASBUN FOR BLOOMBERG BUSINESSWEEK

◀ the first atomic weapons. "I could easily describe many of the things that we're doing here as 'a Manhattan Project for blank,'" he said. "Calling them 'moonshots' rather than 'Manhattan Projects' is probably better marketing."

When Thrun left X in 2012, he handed the reins to Teller. The early crop of projects were mostly planted by Page and Brin, and Teller wanted new ideas. To systematize the creation of projects, Teller built out a team known as Rapid Evaluation. This group stress-tested dozens of ideas with the intent of surfacing the most promising. A stable of lawyers and accountants was hired to handle issues like regulatory compliance and contracts, so the entrepreneurs didn't have to trouble themselves with such concerns. As X grew, Teller shielded it from the outside world and even the rest of Google. He believed such isolation was necessary for X to "make a huge impact in the world and also make a huge return for Google," says Will Patrick, an early member of the Rapid Evaluation team.

But the huge returns were theoretical, and X couldn't hide from financial statements for long. In 2015, Page and Brin restructured Google as a conglomerate, with X as the breeding ground for new ventures. Employees were at first energized by the shift, which endowed their work with greater purpose. But the process of Alphabetization brought more scrutiny. Investors had never known before exactly how much Google spent on X, because its costs were lumped in with the rest of the company's. Now shareholders had clearer visibility thanks to a new line item: Other Bets.

Porat, who joined shortly before the formation of Alphabet, began meeting regularly with Teller and scrutinizing projects in X's portfolio. Around this time, X developed a system designed to estimate the commercial viability of each moonshot, says Loon co-founder Cliff Biffle. The initiative was called Moneyball.

Still, X remained a magnet for talent inside and outside of Alphabet. It was where the board met and the founders spent time. Brin regularly brought Bono and other friends for tours. His compound on the third floor, a wing of conference rooms he shared with Page that required special badge

▲ **X's office in Mountain View**

access, was the subject of so much intrigue that it became known as Narnia, say four former employees.

Even under the watchful eye of Porat, X's budget continued to grow. Colleagues were reluctant to criticize one another's work, and troubled projects would grow unwieldy until Teller would finally withdraw support, former employees say. Ones that did get the ax were commemorated at Dia, an annual party inspired by Mexico's Day of the Dead that featured dancers, margaritas and a tequila tasting. The ritual was meant to portray failure as a natural part of a team's life cycle, a cause for celebration and an opportunity to begin anew.

Ventures that might have succeeded as standalone companies were sometimes absorbed into Google. After starting Loon, Biffle worked on a computer chip customized for machine learning software, which drew interest from prospective customers outside of Alphabet, he says. He and his team were delighted—until Alphabet folded the product into another AI unit of the business around early 2019. "Google is a technology-hoarding company," says Biffle, who now works at a startup that makes servers.

Teller's philosophy of isolationism sometimes conflicted with Porat's goal of profitability. One X project that sought to set up a system to accept payments from outside clients couldn't do so because it required approval from another part of Alphabet, Biffle says. "People outside X are not incentivized to help X," he says.

In 2019, Page handed over his role as Alphabet's CEO to Pichai, the head of Google. Financial scrutiny intensified soon after, and the lab's budget, which totaled hundreds of millions

CAYCE CLIFFORD FOR BLOOMBERG BUSINESSWEEK

“The purpose of X is to make new Alphabet companies. There was a philosophical question: Is this our job, or is this a waste of resources if they become a startup?”

of dollars, flattened and then declined, former employees say. A spokesperson for X says there had always been some fluctuation in X’s budget based on when projects graduated and moved off the lab’s books. Earning a diploma from X doesn’t guarantee success. In 2021, Alphabet shut down Project Loon, the balloon internet initiative which had long stood as a symbol for X’s lofty ambitions. By that point, the return on investment that executives at Alphabet and X expected of moonshots was gradually rising. At an all-hands meeting in 2022, Teller asked employees to put themselves in Pichai’s shoes and imagine how they’d feel about a $1 billion business. He advised them to aim much higher.

Crafting a business plan for a project like an exoskeleton often felt like writing science fiction, but Alphabet’s leadership was unwilling to spend heavily without first considering a business model, as it had done for Loon. What troubled some employees the most were the aging projects that lingered in the lab, competing for dwindling resources. Quarter after quarter, these projects met their goals by reaching new technical milestones or hitting a revenue target, but they had no apparent prospects of graduating into Alphabet. It prompted some employees to conclude that the only way forward might be out.

Kathy Hannun joined X shortly after graduating from Stanford and quickly rose the ranks to project leader. But by 2016, a divide between her and Teller was emerging. Hannun had been hard at work on an effort to develop geothermal heating and cooling systems for people’s homes. Geothermal energy offers an environmentally friendly alternative to propane and other fossil fuels, and Hannun was eager to launch a pilot in New York state. But Teller wasn’t ready to start digging up people’s backyards. He told Hannun there could well be a viable business in geothermal heating–but not for Alphabet.

Hannun was crushed. She loved working at X, but she wasn’t prepared to abandon her project. She was determined to continue her work on the outside, and Teller agreed to explore the option. Over the course of nine months and dozens of meetings with X’s leadership and Alphabet’s corporate development team, Hannun arranged a deal in which a newly formed company, Dandelion Energy Inc., would receive the intellectual property underpinning the project, and Alphabet would retain a minority stake. It was X’s first spinout from Alphabet.

Within months of her exit, Hannun and her small team were drilling small holes behind people’s houses and installing geothermal systems. She credits Teller for the opportunity. “Dandelion has been successful because he pushed us out of the nest, and we were forced to figure it out,” she says.

Although Hannun had broken free, a path outside of X wasn’t available to everyone. Former employees say teams at X found it difficult to hold the attention of the corporate development group, which is used to negotiating multibillion-dollar deals for Google. Members of X’s finance department described the process with Hannun’s company as a “distraction,” she recalls. The deal also forced the company to reckon with fundamental questions about why X even exists, says Obi Felten, one of Teller’s former lieutenants, who helped organize the Dandelion spinoff. “If you define the purpose of X very narrowly, the purpose of X is to make new Alphabet companies,” she says. “There was a philosophical question: Is this our job, or is this a waste of resources if they become a startup?”

After Dandelion, Alphabet evaluated each business proposition on its own merits. One unloved X project called Project Malta, which sought to store energy in molten salt, struggled to secure Alphabet’s blessing for its team to spin out. In 2018, Alphabet came around after an ex-member of the Malta project who’d become a venture capitalist agreed to invest, says Ty Jagerson, a former X employee who joined Malta after the spinoff. But efforts to save Loon were unsuccessful. Shortly before the balloons were grounded for good, an outside investor expressed interest in an acquisition, say four former X employees. Alphabet nixed the deal in part because Loon had been built upon layers of internal Google code and tools.

Calls for spinoffs, most of which were still going unanswered, grew louder during the venture capital boom of 2021, when investors were flush with cash and seeking to capitalize on a pandemic tech bubble. X, which for so long had promised the perfect balance of Big Tech stability and startup-style experimentation, was starting to feel to some employees like a trap. And even Felten, who’d helped facilitate some of the first spinoffs as Teller’s deputy, has joined the startup fold. While at X, she worked on a project that aimed to find a biomarker associated with anxiety and depression. After X shut down the project in 2021, she used her personal savings to buy the rights to some of the IP and founded her own company, Flourish Labs.

As for Zealand’s exoskeleton, the project while at X went through a familiar trajectory of great promise followed by disenchantment. Her first prototype withstood rigorous testing, including a dash up 61 flights of stairs to the top of Salesforce Tower, San Francisco’s tallest skyscraper. Teller praised Zealand’s team as “Xey,” a term of endearment that connotes a blend of scientific rigor and whimsy. (It’s pronounced like “sexy” without the s.)

But by 2022, Teller and his executive team were encouraging Zealand to move in a different direction. Some favored courting corporate customers looking to increase efficiency in warehouses. Others proposed making immersive video game controllers. Zealand agreed to explore the potential of these markets but was left more convinced that her original focus on human mobility was more promising. On top of that, she was frustrated by obstacles she faced at Alphabet while trying to get approval for partnerships, including one with a major athletic brand, says a person with knowledge of the deal who asked not to be identified because the details are private.

For advice, Zealand quietly contacted former colleagues who’d successfully spun out. She anticipated a protracted ▶

◀ negotiation, but within four months, she and her team were out. Financial terms weren't disclosed, but what's clear is that life after Alphabet isn't glamorous. They took pay cuts of more than 50% and work in a small office with a less robust selection of snacks. VCs have expressed concerns about the startup's unconventional beginnings. "When I would talk to investors, they would be like, 'How do we know that you're not the dud? Why doesn't Alphabet want to keep you?' " Zealand says.

So Teller wrote a letter of recommendation on behalf of Zealand's startup, Skip Innovations Inc. She's managed to raise $6 million in total funding, and the company is engaged in a clinical trial of one of its devices involving patients with Parkinson's disease. (She declined to name the partner.) Zealand hopes to reach a mass market that includes those with milder movement needs. Starting this summer, anyone will be able to preorder one of Skip's devices.

Zealand appreciates the benefits of independence—like the ability to invite a reporter to her office in San Francisco for a demo. Envisioned as a salve for knee pain, the device I tried was shaped like a thigh-high boot and packed with sensors and motors to study my gait and deliver support at just the right moment. Before I took my first step, I could feel the motors twitching in anticipation. When I began to walk, they kicked into gear, reducing the force my muscles needed to exert; their hum crescendoed to a dull roar when I ascended a staircase.

Near the exit of Skip's office, there's a glimpse of the company's potential future: A mannequin wears a pair of pants molded with motors around the hips, thighs and shins, all fashioned in khaki green, fit for a bionic woman heading to yoga class. The reality, though, is that most startups fail, and if that happens in this case, there will be no Alphabet job security at the end of it. It's a risk Zealand is at peace with. "I didn't come to Silicon Valley to stay in a cushy job," she says. "Life is for living."

"When I would talk to investors, they would be like, 'How do we know that you're not the dud? Why doesn't Alphabet want to keep you?'"

On a recent morning, Teller glided across the X lobby wearing dark jeans, a gray button-down and black inline skates—business casual on blades. The Xplex, a corridor employees pass through on their way to work, is equal parts museum and mausoleum. In the most prominent exhibit, one of the last remaining Loon balloons rests in a glass case, never again to drift beyond the low-slung ceilings of this converted shopping center.

Teller started to tell a well-worn story of how X set out to solve the world's connectivity challenges, but then, rather than explaining the team's failure to ground the soaring cost of the balloons, he whirled around and pointed to another piece of hardware hanging from the rafters: a communications terminal. It had been made by Project Taara, a newer effort to deliver wireless, high-speed internet that had come out of Loon. Instead of using balloons, Taara transmits data through beams of light between two terminals, billed as an alternative to fiber optics in places where laying cable isn't feasible, such as across rivers and on protected land. It's seen as one of X's most promising spinout candidates. "We call it moonshot compost," Teller says. "Even if we have to come at things two, three, four times, we often end up with really good solutions."

The tour through Alphabet's exploratorium touched on agriculture, aquaculture, renewable energy, drone delivery and industrial robotics. The museum's polish faded by the end, when Teller reached a pair of oversize poster boards papered with printouts showing X spinoffs, including Dandelion and Skip. The space would soon be renovated to illuminate the diverse paths that X companies have cut through the world. Although it took Teller time to appreciate the value of these exits, he says he's come to embrace them.

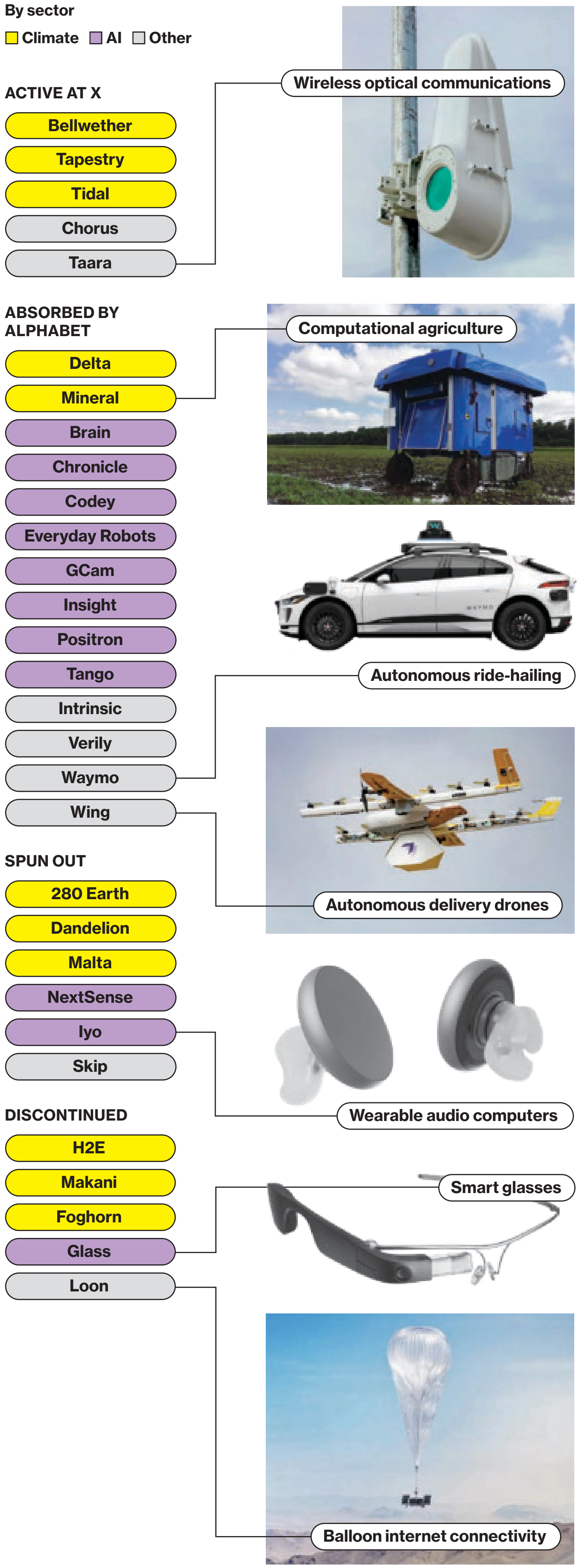
"We've become clear that actually there's an opportunity for us to do more good for the world faster by launching things earlier, getting that sort of market-based capital sooner," Teller says. "That allows us to stay really focused on moonshot origination, which is arguably the thing that we've sort of honed and gotten to be the best at."

As more moonshots prepare to spin out, Teller has assembled a team to assist with what he calls the "midwife process." Ivo Stivoric, a longtime deputy of his, is the chief midwife. He's been meeting with prospective investors and coaching moonshot leaders on how to pitch, a skill many never needed until now. Alphabet's own investment firms CapitalG and GV are unlikely to be among the investors, a spokesperson says, in part because X takes a stake in each spinout.

At least some projects on the spinoff track can still hire, but job postings now include a disclaimer: "If this project is successful, this role will immediately transition into the same full-time role at an exciting early-stage startup outside of X," according to an ad for Tapestry, an X moonshot that seeks to organize electric grid data. The posting suggests Tapestry will spin out in six to nine months. Page Crahan, its general manager, says she's excited to have more freedom to work with partners. "Who knows what we'll be able to do, but it feels like another place that we can be creative," she says.

Meanwhile, Alphabet seems to be digging through the compost for products that could warrant revival. On May 14,

Alphabet's X Projects



X PROJECTS: ALPHABET'S X (7); WAYMO (1). DATA: ALPHABET'S X, SELECTED LIST

when Google unveiled new computer vision software, Brin mused that Google Glass, the early face computer he championed before it was ridiculed to death, would be "the perfect hardware" for this technology if only it weren't 10 years too early. Brin continues to keep a watchful eye on X's work and was among the backers of a carbon capture startup called 280 Earth that spun off in 2022. Gideon Yu, a co-owner of the San Francisco 49ers who also invested in 280 Earth, says he's eager to fund more startups from the lab, because the ones that survive long enough to spin off are among the "hundreds of ideas that have been winnowed down to the very best."

X is looking into raising a fund so it can invest in startups that emerge from the lab, according to a person with knowledge of the plan. But the team is still learning what VCs want. One startup investor who reviewed pitch materials for Tidal, an aquaculture moonshot, says Alphabet was seeking an overinflated valuation for a business with such paltry revenue. The VC, who asked not to be identified discussing private company documents, says Alphabet hadn't even assigned a valuation to its Tapestry deal at that point, and he questions in general the motivations of X-bred entrepreneurs accustomed to Google's gourmet cafeterias and generous compensation.

Teller says X always intended to prepare employees for survival without X. In the early days, he instituted one of the lab's first rituals: graduation. When projects were swallowed up by Google or later given a place within Alphabet, workers would gather for a ceremony featuring mortarboards and diplomas. Teller started holding the events, he says, to temper the sadness of leaving X, which had become a coveted perch within Google. "I wanted them to understand, X is not a permanent place for almost anybody," he says. "I didn't want people to feel kicked out of the Garden of Eden."

Graduation ceremonies will continue, but now that some dead X projects can find an afterlife as a spinout, the future of the Dia parties is uncertain. The event wasn't held last year because of budgetary constraints, and the employee who organized the previous ones was laid off in a round of cuts targeting some of the lab's veterans.

Teller, meanwhile, maintains his daily rituals, even as Alphabet and the rest of the Valley have changed around him. At 53, he still spends the full workday on Rollerblades, though his Achilles tendon bothers him from time to time. "I tell myself it has nothing to do with the Rollerblades," he says. His employee badge, which features a snapshot from a time when his beard was streaked with fewer strands of gray, swishes at his hips as he skates.

Ideas cycle and recycle in Silicon Valley. Even the reinvention of Teller's lab echoes history. In one of its later chapters, Xerox PARC rebranded as PARC and adopted a business model in which it would partner more closely with the industry and spin out its most promising inventions into independent companies. One of those spinoffs was sold to a three-year-old search engine company run by a young Page and Brin. Ⓑ *—With Sarah McBride, Antonia Mufarech and Mark Bergen*

Same Candidates,

The 2024 US presidential election will be a rare candidate rematch, but the electorate has changed substantially since Joe Biden and Donald Trump first faced off. From 2021 to 2023, states across the country have added more than 31 million eligible voters, accounting for people who moved from a different state, turned 18 or became naturalized, a Bloomberg analysis shows. That's almost 1 million more new potential voters than in the three years after the 2016 election. Combined with changing demographics—such as those related to educational attainment, a powerful partisan fault line—these shifts will help decide the outcome, especially in key battlegrounds where the margin of victory is likely to be slim.
—*Andre Tartar, Minh-Anh Nguyen and Gregory Korte*

WISCONSIN

2020 winner **Biden**

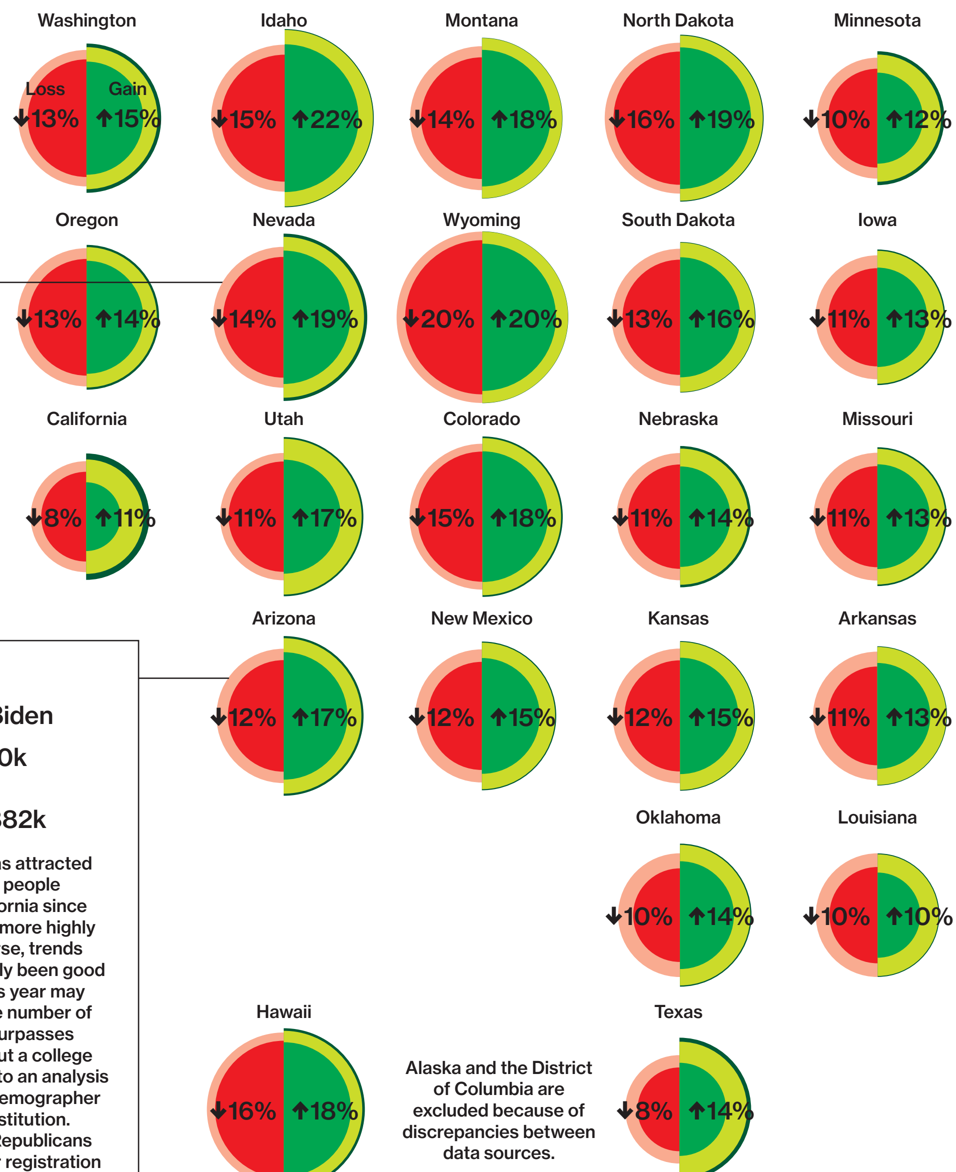
2020 margin **21k**

New eligible voters **504k**

Although Wisconsin has seen a relatively modest change to its total electorate, it has the fifth-highest rate of de-registrations nationwide. This creates a bigger headache for campaigns trying to find people who've been purged from the rolls because of reasons such as inactivity.

Change since 2020, as a share of electorate

Loss: Migration out, Deaths
Gain: Migration in, Teens aging into electorate, Naturalizations



Alaska and the District of Columbia are excluded because of discrepancies between data sources.

NEVADA

2020 winner **Biden**

2020 margin **34k**

New eligible voters **397k**

The Silver State has one of the most changed electorates in the US. Its eligible voter base has seen a double-digit decline in non-college-educated White adults since 2008, whereas the non-White share has grown rapidly. Predicting the outcome in this battleground will be harder than ever.

ARIZONA

2020 winner **Biden**

2020 margin **10k**

New eligible voters **882k**

The state, which has attracted as many as 83,000 people annually from California since 2020, is becoming more highly educated and diverse, trends that have historically been good for Democrats. This year may be the first time the number of non-White voters surpasses White voters without a college degree, according to an analysis by William Frey, a demographer at the Brookings Institution. At the same time, Republicans had increased their registration lead in the state by more than 110,000 voters as of April.

Different Voters

MICHIGAN

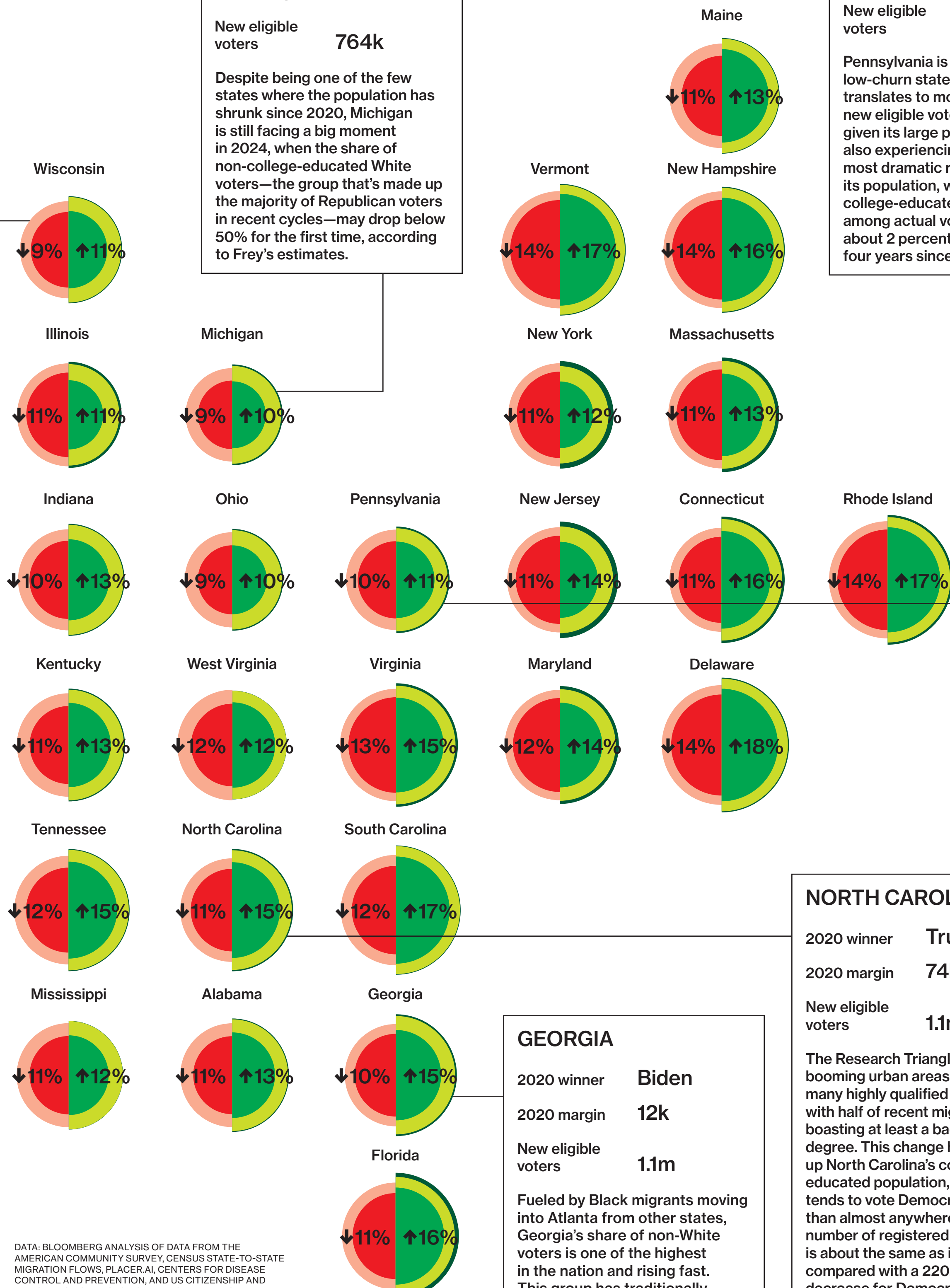
2020 winner	Biden
2020 margin	154k
New eligible voters	764k

Despite being one of the few states where the population has shrunk since 2020, Michigan is still facing a big moment in 2024, when the share of non-college-educated White voters—the group that's made up the majority of Republican voters in recent cycles—may drop below 50% for the first time, according to Frey's estimates.

PENNSYLVANIA

2020 winner	Biden
2020 margin	81k
New eligible voters	1.1m

Pennsylvania is a relatively low-churn state, but that still translates to more than 1.1 million new eligible voters since 2020, given its large population. It's also experiencing one of the most dramatic realignments of its population, with the share of college-educated White adults among actual voters rising by about 2 percentage points every four years since 2008.



NORTH CAROLINA

2020 winner	Trump
2020 margin	74k
New eligible voters	1.1m

The Research Triangle and other booming urban areas are pulling in many highly qualified job seekers, with half of recent migrants boasting at least a bachelor's degree. This change has pushed up North Carolina's college-educated population, a group that tends to vote Democratic, faster than almost anywhere. Yet the number of registered Republicans is about the same as in 2020, compared with a 220,000 decrease for Democrats.

GEORGIA

2020 winner	Biden
2020 margin	12k
New eligible voters	1.1m

Fueled by Black migrants moving into Atlanta from other states, Georgia's share of non-White voters is one of the highest in the nation and rising fast. This group has traditionally leaned Democratic, but polls have shown Trump making some inroads.

DATA: BLOOMBERG ANALYSIS OF DATA FROM THE AMERICAN COMMUNITY SURVEY, CENSUS STATE-TO-STATE MIGRATION FLOWS, PLACER.AI, CENTERS FOR DISEASE CONTROL AND PREVENTION, AND US CITIZENSHIP AND IMMIGRATION SERVICES. ESTIMATES WERE ALIGNED ACROSS CALENDAR, FISCAL AND ELECTION YEARS. DEMOGRAPHIC TRENDS FROM ANALYSIS OF CURRENT POPULATION SURVEY VOTING SUPPLEMENT DATA BY WILLIAM FREY (BROOKINGS INSTITUTION). REGISTRATION DATA FROM CATALIST, ARIZONA SECRETARY OF STATE AND NORTH CAROLINA STATE BOARD OF ELECTIONS.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SAY GOODBYE TO QUIET LUXURY

Statement jewelry is back, and you sure can't miss it

By Kristen Shirley
Photographs by Joanna McClure

June 3, 2024

Edited by Chris Rovzar

Businessweek.com

Gone are the stacks of delicate bracelets and wispy chains that graced stylish women everywhere. They've been replaced by big, chunky pieces with brightly colored gemstones, polished yellow gold and diamonds, naturally. Women who tested the waters of fine jewelry with relatively inexpensive, dainty baubles are graduating to more significant ones, and in a saturated market, established collectors are searching for jewels that stand out from the crowd.

Camille Zarsky, founder and owner of the Seven in Manhattan's West Village and Sag Harbor in the Hamptons, is seeing the trend play out in her boutiques and throughout the industry. "People are seeking a deeper connection to jewelry and also looking for larger-scale pieces even for everyday wear," she says. "There's a movement away from lots of small layering pieces in favor of a bigger chain or an oversized pendant."

Big, bold jewelry isn't new, of course, but it's back in fashion with a vengeance. "It's an aesthetic that has been favored practically since the dawn of time," says vintage collector and dealer Briony Raymond. "The cyclical nature of this style is a testament to the universal appeal of statement-making pieces."

Whether crafted from polished gemstone beads or shiny gold and diamonds, these bigger baubles take Wilma Flintstone into the world of high fashion. "An entire outfit can come alive with the right assortment of statement-making jewels," Raymond says. "There is something so empowering–and *fun*–about throwing on a big gold hoop or an oversized collar."

The trend can be worn in ways large and small. A fanciful cocktail ring like Cartier's new extra-large Clash de Cartier is a relatively easy way to join the club, while a pebble necklace from Belperron or Taffin is a more significant investment.

There's a sense of playfulness surrounding these pieces. Bubblegum-colored gemstones that look juicy enough to eat work perfectly with bright beads or vibrant enamel and ceramic. Some designers take this fun-loving approach literally: Parisian jeweler Marie Lichtenberg has turned the classic Magic 8 Ball toy into a necklace and encased it in gold, enamel and diamonds.

Whether you want a museum-worthy piece of high jewelry or an anything-but-simple accessory to dress up an outfit, here are eight options to encourage you to go bold or stay home.

Previous page, from left:

Briony Raymond selects an exquisite collection of estate jewelry for her New York showroom, with pieces that are as au courant as they were then. This bib necklace from the 1970s is made from 18-karat yellow gold and features links inlaid with round brilliant diamonds. *$34,500*

Parisian designer Suzanne Belperron was one of the most important women in the industry during the 20th century. She never signed her pieces, relying on her distinctive aesthetic of curving lines and polished beads to distinguish her jewelry. This necklace is an homage to one of her favorite colors, with 22 round plum-colored chalcedony beads. *$23,000*

Retrouvai's cascading domino ball chain employs an asymmetrical pattern using 14-karat yellow gold balls that grow from small to large along the necklace. At the center is a 10-carat mint tourmaline. *$38,870*

1. Tiffany & Co. Torsade necklace
One of the last pieces legendary designer Paloma Picasso made for Tiffany, it has twisting strands of orange spessartine beads that are connected by a trio of gemstones: more than 39 carats of blue zircon, 31 carats of rubellite and 22 carats of tanzanite. *Price on request*

5. Suzanne Kalan cuff
This significant piece keeps the spirit of Kalan's best-known design—Fireworks, which features baguette diamonds or gemstones in an irregular pattern reminiscent of a sparkling explosion—but with 9.55 carats of pavé diamonds. *$60,000*

6. Taffin necklace
You can't out-statement this statement piece from Taffin. It has more than 800 carats of amethyst cabochons set with 18-karat rose gold and brilliant purple ceramic. The polished gemstones go all the way around the necklace, making it gorgeous from every angle. *Price on request*

2. Clash de Cartier XL ring
This mammoth version of the Clash de Cartier ring is a great way to embrace chunkier jewelry. The 18-karat rose gold ring underscores the collection's spike-and-ball motif and can also come with diamond and onyx or Tahitian pearls. *$10,100*

3. Tabayer Oera necklace
Crafted from 18-karat gold, red jasper, sapphire and brown diamond, this necklace is a modern interpretation of Inanna's knot, a Mesopotamian symbol associated with the goddess of protection. *$117,000*

4. Marie Lichtenberg Magic 8 Ball necklace
This collaboration with Mattel will delight everyone who sees it. The pendant is a working Magic 8 Ball set in gold with white enamel and a diamond "8." Ask a question, flip it over and watch an answer emerge from its inky depths. *$21,560*

7. Jade Ruzzo Cymbal earrings
Band class is in session. These playful earrings look like the crashing musical instrument but are rendered in elegant yellow gold. Each features a half-moon diamond. *$12,800*

8. Louis Vuitton Fine Jewelry Cuban chain bracelet
The classic Cuban chain bracelet gets the Louis Vuitton treatment. Half of the 18-karat gold links are set with round, brilliant-cut diamonds; the others are decorated with the LV monogram, star and flowers. *$39,000*

Greek Modernism

Among the ranks of independent designers, Nikos Koulis is at the cutting edge

An $82,000 aluminum and white gold bracelet (above) and a $1.47 million ring (left) with an 8-carat oval diamond

Greek jewelry designer Nikos Koulis is having a moment. Thank Beyoncé: During her press tour for *Cowboy Carter*, the superstar wore his custom bolo necklace with an 11-carat Colombian emerald surrounded by trapezoidal diamonds. The glittering necklace was striking and, in the jewelry world, instantly recognizable as a Koulis creation.

To be fair, the independent designer has been racking up triumphs for years. In 2020, Koulis won a Gem Award, considered the Oscar of jewelry design, the second time he'd been nominated. He deftly places pearl studs ($5,520) from his Spectrum collection in a blackened-gold cage and accents them with rays of black diamonds fanning outward. Feelings gold hoop earrings ($9,000) become a statement piece with diamonds flanking their sides.

But it was his Oui collection that catapulted him into the international market in 2015. Continually updated, it remains a hit. For the collection, he reworks classic art deco geometry and black-and-white color schemes with modern flair, replacing traditional onyx with a proprietary Greek enamel. Striking settings and unusual gemstone placements, often with rich green emeralds, are his hallmarks.

Jennifer Shanker, founder and chief executive officer of Muse, an independent New York showroom and shop, first saw his work at Couture, a trade show in Las Vegas, in 2013. "I was immediately taken by his jewelry in a kind of surprising and emotional way," she says, so much so she sought to represent him.

Oui is one of the rare jewelry collections that ranges from small $2,000 pendants to price-upon-request showpieces. One necklace in the collection with emerald-cut diamonds regularly sells out, and stores keep repurchasing it. "We can't keep it in stock," Shanker says. "And it's over $100,000."

"Greek jewelry and history is in my DNA," says Koulis, 47. He grew up in a family of established jewelers, and he's passionate about architecture—a career he almost pursued, until he realized his math skills wouldn't cut it. Pivoting to jewelry and its sculptural aspects, he earned degrees from the Gemological Institute of America and started his business in 2006.

His latest collection, Me, which hit stores last September, departs from rigid geometry to include more organic forms. Gold drop earrings ($54,960) feature diamonds that trail up the sides and almost meet in the middle, as if they're enveloping the gold. One multipart, avant-garde piece ($82,000) uses a curvy brushed-aluminum cuff as a backdrop for two diamond tennis bracelets and a third one made of emeralds. "No one knows what he's going to do next," says Shanker of the unexpected shift. "It's his energy that changes, and when his energy changes, the collection evolves."

In the summer ahead, Koulis is celebrating the 10th anniversary of his original Mykonos boutique and opening two more in Athens, one of which is a made-to-measure atelier. The bespoke business currently accounts for about 50% of the company's revenue, though the volume of fine jewelry sales is larger. Depending on the gemstones and the amount of craftsmanship, the process can take a year to complete.

Koulis doesn't want to increase his points of sale, which number 33 globally, but to expand what's available at each. Demand is constant, especially for the jewelry pieces he designs around spectacular gemstones.

A $778,800 necklace from Koulis' Me collection sets a 14-carat Colombian emerald on an 18-karat blackened-gold collar

"Clients have been trained that his pieces do not last long, so they jump on one-of-a-kind pieces," Shanker says. "They will launch a piece in New York at Bergdorf Goodman, and in 24 hours he will have multiple sight-unseen orders."

Teresa Panico, director of marketing and fine jewelry at Material Good in Miami and New York, says Koulis' collections appeal to both new and established collectors: "When you have all the basics, what's something cool, amazing, different and unique? Nikos." Ⓑ

COURTESY COMPANY

Men's Jewelry Catches Up

Brands are betting that a certain kind of guy is ready to spend big

Lately, famous men have been embracing outsize jewelry for their biggest public moments. Whether it's chunky gold necklaces draped over colorful suits at the NFL draft or the cavalcade of diamond brooches pinned to tuxedos at the 2024 Academy Awards, male celebrities are going bold—and the world's biggest jewelry makers are betting everyday shoppers will soon follow.

David Yurman, John Hardy and Louis Vuitton were among a host of brands this year that unveiled new fine- and high-jewelry collections with precious metals and gemstones. Prices are way up, too.

For the women's market, the term "high jewelry" refers to pieces with exceptional craftsmanship and large, rare gemstones; the showstoppers are often one of a kind. For the men's, though, the phrase is used less precisely. David Yurman's new "high jewelry" collection, the Vault, features a few signature designs—link bracelets, dog tags, chain necklaces, signet rings—but merely upgrades them with gold, platinum and diamond embellishments. In a women's collection, this would simply be considered fine jewelry.

Reed Krakoff, creative chairman of John Hardy and former chief artistic officer at Tiffany & Co., sees a larger acceptance of men experimenting with personal style. Before, he says, "you would see men wearing a diamond stud or a signet ring, and now it's much more about creating a look that's your own. I think athletes are really at the forefront of it."

Indeed, many football players treat stadium entrances like runway shows. And for actual high-fashion moments such as the Met Gala, Miami Dolphins wide receiver Odell Beckham Jr. and Kansas City Chiefs quarterback Patrick Mahomes have worn necklaces and brooches. The men who look up to them have noticed.

"These stars have a significant impact on their loyal following, who have incorporated this trend" into their everyday looks, says George Archer, buying manager at men's fashion retailer Mr Porter. They are, however, doing it more subtly. "Through mirroring the style influence of the profiles they admire in a 'real' way, they have helped normalize statement jewelry."

This Les Gastons Vuitton small tag pendant in yellow gold and titanium ($3,600) is part of Louis Vuitton's fine jewelry collection aimed at men

COURTESY COMPANY

In a recent report, Polaris Market Research found the size of the men's business was $5.2 billion in 2023 and expects it to grow to almost $11 billion by 2032. "In the past three to four years, the market has gained increased awareness," says the report's lead analyst, Rohan Mahal. "The women's jewelry market is highly mature, so we feel that the men's jewelry market is going to grow at a much higher scale."

Louis Vuitton introduced its men's fine jewelry collection, Les Gastons Vuitton, in January as a group of 16 pieces that includes necklaces with LV monogram tags. Its prices range from $2,080 for a single trunk-shaped earring to $42,500 for a white gold chain necklace with diamonds. Prices in the Vault collection by David Yurman range from $17,500 for a pavé diamond link bracelet to $295,000 for a link bracelet with 40 carats of diamonds.

In January fine jeweler Lagos introduced its men's collection, Anthem, named in honor of a Grateful Dead album, *Anthem of the Sun*. Prices start at $150 and top out at $7,800, with pieces crafted from materials such as 18-karat gold, sterling silver and ceramic. Some designs feature black diamonds, emeralds and Tahitian pearls—plus totems of skulls and crossbones, daggers, gladiator helmets and snakes.

This kind of imagery, along with simple styles like chains, ropes, chunky rings and ID tags, is viewed by these makers as safe territory. Don't expect huge experimentation anytime soon. "We are doubling down on statement jewelry that has a sense of timelessness and pieces that can be worn forever, for any occasion," says Mr Porter's Archer. "Yellow gold and white diamonds lead the charge."

Krakoff's goal is to make men's jewelry account for half of John Hardy's business. "You see big, bold rings in sterling or gold with diamonds and sapphires, and those pieces are doing super well already," he says. Eventually "you'll start to see more bold graphic jewelry—a next step away from traditional jewelry in the men's category."

When gents dip their toes into these waters, they may start with an inexpensive piece, then upgrade to sterling silver, followed by gold, then finally high jewelry. And these brands will be ready for them. B

Twinkle For Your Toes

Loafers as colorful as gemstones are strutting their stuff

By Antonina Jedrzejczak
Photographs by Janelle Jones

The quiet luxury era might still be dominating the sweaters and trousers in your closet, but this summer, the muted creams and grays stop at the ankle.

Loafers, a ubiquitous style for the warmer days ahead, are undergoing a Technicolor transformation.

"People are a bit tired of being subdued," says Michael Prendergast, managing director in the consumer and retail group of consulting firm Alvarez & Marsal. Two of the biggest trends for the casual shoe style this season, he says, are "bright colors and bold patterns."

Jordan Hancock, lead designer at direct-to-consumer brand Taft, says patterned loafers are outselling plain ones; almost 60% of their sales feature bright combinations. "If you can incorporate weaves and interesting cutouts," he says, "that's something people will grab onto."

It's a movement taking hold among both men and women, from traditional penny loafers to more ornate styles.

Compared with seasons past, men's versions are getting more adventurous. "You see men accessorizing and developing their style at a more meaningful level these days," Prendergast says. "If you look at the breadth and depth that's being offered in the market, it definitely points to an expansion."

The trend, in other words, has legs. Here are seven favorites this season.

Ferragamo
It's hard to beat the impact a glossy cherry-colored shoe can have on even the most basic of outfits. Ferragamo's calfskin pair for women in flame red has an elegant weave of top stitching along the toe that's reminiscent of a moccasin, and the brand's logo is blind-embossed across the saddle. Timeless and eye-catching, they're the ideal way to add elegance without having to sacrifice comfort. *$850*

Belgian Shoes
A staple of heritage New York City style, the Belgian Shoes brand was introduced by Henri Bendel's nephew in the 1950s and has had a boutique on the Upper East Side for almost 70 years. The basic structure and shape of the fittingly named Mr. Casual hasn't changed much over the decades, but you can now get the soft-soled option seen here in woven green suede with signature bow and trim details. *$675*

Artemis
Made in a family-run workshop in Istanbul from vintage Turkish kilims, each pair of Artemis shoes is unique. The textile is characterized by its thin, tight weave, and these women's loafers, which feature a ¾-inch heel, come in a wide array of pastel or bright combinations. "Originally used as a floor carpet in someone's home, these materials are giving a new life to something beautiful," says founder Milicent Armstrong. *$288*

PROP STYLIST: ANDREA BONIN

Fratelli Rossetti
These Brera loafers for men prove that the 71-year-old Italian brand isn't afraid to shake things up. Lined in sumptuous leather, the kaleidoscopic velvet body is finished off with raised layers of embroidery in the shape of hearts and curving floral motifs. A matching leather tassel hides in plain sight and completes the psychedelic effect. *$1,190*

G.H. Bass
Dubbed "Weejuns" as a play on the Norwegian farm shoes that inspired the style, the Bass loafer was first released in 1936 and remains a classic. The brand's new Larson two-tone pair for women showcases handsewn stitching on the toe, a full-grain leather outsole and an unlined footbed in keeping with the traditional format. The blue-and-navy color combination makes it look effortlessly modern. *$175*

Vinny's
The Copenhagen-based cobbler introduced its loafers in 2020 as an antidote to the sea of sneakers dominating fashion. Since then, its selection has grown to include a range of women's and men's shoes, including the Townee tri-tone penny loafer for men, seen here in a pale pink, tan and white—a cheeky play on a boarding school staple. They're made in Portugal from durable cowhide leather. *$350*

Taft
Whether you prefer graphic checks or dragonfly patterns, the men's Fitz loafer from Taft comes in 17 dizzying patterns and colors. Our favorite is the Fiore with its crimson floral cotton jacquard design seen here. Handmade in Spain, the pair comes with a double leather sole with anti-slip rubber inserts and black leather accents at the heel and saddle. *$275*

Time to Get Creative

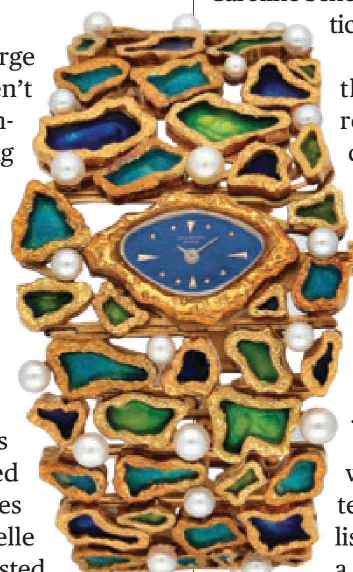
High-design watches with innovative gem-setting and gold-shaping are finding their moment to shine

By Carol Besler

The most imaginative timepieces to emerge from the April watch fairs in Geneva weren't the historical tourbillons or perpetual calendars. Instead they were models with exciting design, including sculpted gold watches, ones adorned with gems in innovative settings and pieces decorated using traditional techniques known as *métiers d'art*.

In other words, jewelry watches.

Serious collectors have long sniffed at the category, but it's beginning to rise in prominence. Kevin Costner sported a Chopard L.U.C Heritage Grand Cru with 2.9 carats of diamonds at the premiere of his planned four-part epic, *Horizon*, at this year's Cannes Film Festival. Stars from Lil Nas X to Michelle Yeoh wore high-design and diamond-encrusted watches to the Met Gala in May.



The 1962 Patek Philippe in gold with pearl and enamel accents

The secondary market is getting behind exotic vintage pieces, too. At a Christie's auction in Geneva in May, a "haute joaillerie" white gold diamond- and sapphire-set Audemars Piguet skeleton watch sold for 52,920 Swiss francs ($57,817), more than twice its high estimate.

The Reflection de Cartier cuff watch in white gold and diamonds

But most important, top brands are finally paying real attention to the niche and creating exciting new models.

Cartier's architecturally inspired Reflection cuff puts the watch dial at one end of a bracelet, so it can be viewed in reflection on the polished other end. Even sports watches, traditionally made of simple steel or gold and aimed at male collectors, are getting into it. Among Chopard's usual floral-motif jeweled pieces this year was the Alpine Eagle 41 XP Frozen Summit, a sports watch with more than 13 carats of diamonds. Chris Hemsworth wore it at the Met Gala. "We have noticed a bigger interest in larger, sporty gem-set watches that can be worn from day to night, and we've made our own contribution to that," says Caroline Scheufele, co-president and artistic director at Chopard.

Backes & Strauss' Queen of Hearts Blue Velvet watch with 36 purple heart-shaped sapphires around the bezel

The trend is not just on the red carpet but also at retail. David Hurley, deputy chief executive officer of the Watches of Switzerland Group Plc, is seeing an uptick in sales of jeweled watches. "The men's segment is up to 16% of timepieces versus just 11% two years ago," he says. The women's segment is steadier but still increasing "by 5%, to 42%, on a one-year basis."

Sotheby's curated a selection of two dozen jewelry watches in a special sale it called "Rough Diamonds," held in April in a Geneva wine cave. The sale was co-produced with the team from creative agency and magazine publisher Heist-Out (which, when pronounced with a French accent, sounds like "iced-out"). The collection sold out in less than an hour for a total of $1.3 million. The top lot was a Patek Philippe Reference 3290 created in 1962 by designer Gilbert Albert. The set contained a bracelet watch, ring and necklace in yellow gold decorated with enamel and set with pearls. It sold for $435,727, eight times its high estimate.

"We've historically offered jeweled watches in our auctions, but these 24 pieces stand apart for their avant-garde design narrative and their rarity," says Josh Pullan, head of Sotheby's luxury division. "Many were produced by hand using techniques that perhaps don't even exist anymore."

Backes & Strauss, the world's oldest diamond company, started focusing on high-end jeweled watches in 2006 when it formed a partnership with Swiss horologer Franck Muller. This year the company is using less common gems such as peridot and purple sapphire. "There is a growing demand for more colored gemstones in high-end jewelry pieces," says CEO Vartkess Knadjian. "Originally we worked with round-brilliant and baguette-cut diamonds, but now we're using more colored gems and fancy cuts."

And just who is asking for these gem-set pieces? "You would be surprised," he says. "In some markets, women choose the bigger sizes we crafted for men. In general, I would say male clients are buying more gem pieces." B

COURTESY COMPANIES

Off Your Rocks

A highlight of the latest high-jewelry collections is a necklace with unconventional stones

Photograph by Joanna McClure

High jewelry was once the exclusive realm of diamonds, rubies, emeralds and sapphires. But today's designers use a wider range of gemstones, many of which are more readily available in larger sizes, to craft wild creations that showcase their ingenuity. New York-based Taffin, helmed by designer James de Givenchy, is already well-known for its unique pieces with exquisite gemstones and liberal use of colorful ceramic. But the brand has outdone itself with a necklace (price on request) that pairs turquoise ceramic with two massive aquamarines.

THE CASE
This one-of-a-kind, ultramodern necklace design uses two crossing wires of 18-karat rose gold that end asymmetrically in bright ceramic swoops. Each is tipped in an enormous aquamarine; the two total more than 150 carats in all. The necklace fastens in the back with two turquoise ceramic balls, giving a playful touch to such a significant piece. *Price on request; taffin.com*

THE COMPETITION
- Rock crystal is a Boucheron signature, and on the Tricot necklace (price on request) hand-shaped pieces of the transparent quartz are set to look like braided fabric, taking 1,070 hours to create.
- Bulgari's Prodigious Color necklace (price on request) has five huge cabochon gemstones in a rainbow of amethyst, citrine, rubellite, blue topaz and pink quartz, set among diamond and green tourmaline inserts.
- The Chant des Gondoliers necklace from Van Cleef & Arpels (price on request) highlights the beauty of large oval-cut turquoise cabochons. They hang from a diamond collar with an arch motif that echoes the bridges of Venice. —*K.S.*

Invest

Ones to Watch

We looked across the industry to find both established players and yet-to-be household names in banking, private equity and asset management. Among those making an impact are a CEO, a CFO, hedge fund founders and innovators in alternative currencies.

Natalie Adomait

Chief investment officer of transition investing, Renewable Power & Transition Group, Brookfield Asset Management, London

While much of the world was still in pandemic lockdown, Adomait was part of a team building the world's biggest global energy transition fund. She helped raise $15 billion and is now working on a second fund to invest in wind and solar energy, battery storage, carbon capture and nuclear power. —*Layan Odeh*

Amrita Ahuja

Chief financial officer and chief operating officer, Block Inc., San Francisco Bay Area

Ahuja was drawn to Block, owner of the Square payments platform, after seeing the logistical challenges her own parents faced as small-business owners. The company recently raised its annual profit forecast, and Ahuja says ventures like Cash App and Bitcoin business Spiral aren't hindering earnings growth. "Our scale now means that we can put more effort back into innovation and experimentation." —*Paige Smith*

Darren Cohen

Co-head and chief investment officer, Growth Equity, Goldman Sachs Group Inc., New York

Cohen is a driving force behind Goldman Sachs' $5.2 billion fund dedicated to investing in private companies. At a time when rivals are reeling from a two-year bust in the tech industry, the fund has been able to purchase stakes in some of the world's most valuable private companies, including Stripe Inc. and Canva Inc. —*Bailey Lipschultz*

Mala Gaonkar

Founder, SurgoCap Partners, New York

Gaonkar is a force within the largely White, male-dominated hedge fund industry. Her SurgoCap Partners raised $1.8 billion when it started in January 2023, making it the largest female-led hedge fund debut in history. SurgoCap (*surgo* is Latin for "to rise") gained about 20% in its first year of trading, and assets have swelled to $2.7 billion. —*Hema Parmar*

Akila Grewal

Partner and global head of credit product, Apollo Global Management Inc., New York

Grewal is a key player in Apollo's push to make private credit an asset class in the portfolios of investors, from individuals to the biggest sovereign wealth funds. She pitches clients on the merits of converting some of their traditional investments to private credit, which some perceive as riskier than publicly traded debt. "Take some portion of that and go a little bit less liquid and you can massively outperform," she says. —*Allison McNeely*

Alyse Killeen

General partner and managing partner, Stillmark, Los Angeles

When Killeen founded venture capital firm Stillmark five years ago, Bitcoin was just breaking out of a bear market. She envisioned a unique firm that could offer both institutional knowledge and expertise in Bitcoin technologies. "We're immersed not just in the market and conversations with entrepreneurs, but also with open-source developers and researchers that are studying the tech that we're studying ourselves," Killeen says. —*Norah Mulinda*

Nick Laster

Founder and chief investment officer, Lykos Global Management, Stamford, Connecticut

At 35, Laster is one of the youngest fund managers to go it alone after spending the better part of a decade at Soros Fund Management LLC. His Lykos Global Management is raising an inaugural fund at $1 billion. Lykos already made its mark by participating in a funding round for AI cloud provider CoreWeave Inc. in May alongside more established players. —*B.L.*

Tim Spence

CEO, Fifth Third Bancorp, Cincinnati

Spence's task is to steer a 165-year-old Midwest bank into the digital age. He sees the next decade bringing comprehensive change to banking, given the shifting global economy, efforts to change regulation and, of course, the emergence of AI. "If we play our cards right, in the next 10 years we're going to be able to build a bank that doesn't just navigate and survive all of these changes, but has the ability to lead," he says. —*Bre Bradham*

Shelley Stewart III

Senior partner, McKinsey & Co., New York

For Stewart, investing and improving lives go hand in hand. In addition to his work with corporate clients in McKinsey's private equity practice, he leads research at the McKinsey Institute for Black Economic Mobility, a think tank to advance racial equity. Private capital players have an important role, he says. "I truly believe that we can make our capitalist system work better for more people." —*N.M.*

Savita Subramanian

Head of US equity and quantitative strategy, Bank of America Corp., New York

Subramanian predicts that the S&P 500 will hit 5,400 by the end of 2024, one of the most bullish forecasts on Wall Street. It's not just that call that makes her stand out—it's her understanding that staying invested is what tends to make the difference in returns. As she put it in a May research report, "'Time in the market beats timing the market' is an old but prescient adage." —*Edward Harrison*

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