

# Bloomberg Businessweek



Designed by Marlboro in Virginia

The tobacco industry gets its Silicon Valley on [p46](#)

## SECURITY WITHOUT STRESS

NEC's facial recognition technology works behind the scenes for better solutions in a better world.



In May 2016, a perfect storm of increased travelers, new security procedures and fewer screeners led to massive lines and missed flights at Chicago's O'Hare and other major airports in the United States.

Officials took effective steps to address the issue and security wait times were soon back to normal, but the delays highlighted a key challenge of the modern world: balancing security with convenience.

Dependable and hassle-free international travel is a requirement for global business, but public officials and airlines can't sacrifice security for efficiency. At the same time, demand for air travel continues to grow, increasing the stress on security resources.

In 2015 alone, the U.S. Transportation Security Administration screened more than

**705 million**  
passengers  
(40.7 million more than 2014).

Biometric technology offers a solution. JFK Airport in New York is the busiest international airport in the United States, welcoming more than 30 million international travelers annually. Last year, U.S. Customs and Border Protection (CBP) began employing NEC's facial recognition

technology at JFK. The software captures a live facial picture of the visitor and compares it with the picture on a passport.

The NEC technology helps CBP increase border security while making the process faster and easier for travelers. The convenience factor can be the tipping point that leads to widespread adoption of new technologies, according to Raffie Beroukhim, Senior Vice President at NEC America.

"The challenge is finding a balance between security and convenience," Beroukhim says. "I believe that if technology is convenient, its usage is more widely accepted."

NEC's facial recognition technology is the world's best in search speed and accuracy, according to the National Institute of Standards and Technology.

The deployment of NEC's facial recognition technology at JFK is an example of using biometrics in identity and access control security, like matching an identification photo to a live person at an airport, concert or sporting event.

NEC is a leader in these identity access-control solutions, yet the true value of NEC's solutions is revealed when the software matches a live image against millions of "faces in the wild," unconstrained images from security cameras, known databases and other sources.

"Our core value is searching one to many, like finding a needle in the hay stack, and

searching many to many," Beroukhim says. In times of crisis, this technology can be a key tool for law enforcement. According to researchers at Michigan State University, if an unconstrained face recognition search had been carried out after the 2013 Boston Marathon bombing, one of the two suspects could have been identified from a video of the bombing with NEC's technology.

Applying the latest technology to meet the essential needs for safety and security and harmonizing this technology for convenience and intuitive use is part of NEC's commitment to being a social-value innovator. Facial recognition technology has applications for border control, for protecting critical infrastructure, and even for finding a lost child in a stadium that help fulfill NEC's corporate mission to create a brighter society and future for all.



Raffie Beroukhim  
Senior Vice President at NEC America

"Our passion and culture is in developing technologies and offering them in solutions that bring brightness and happiness to societies," Beroukhim says. "Those are the ideals that NEC brings to market."



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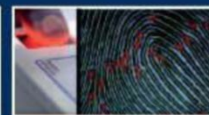
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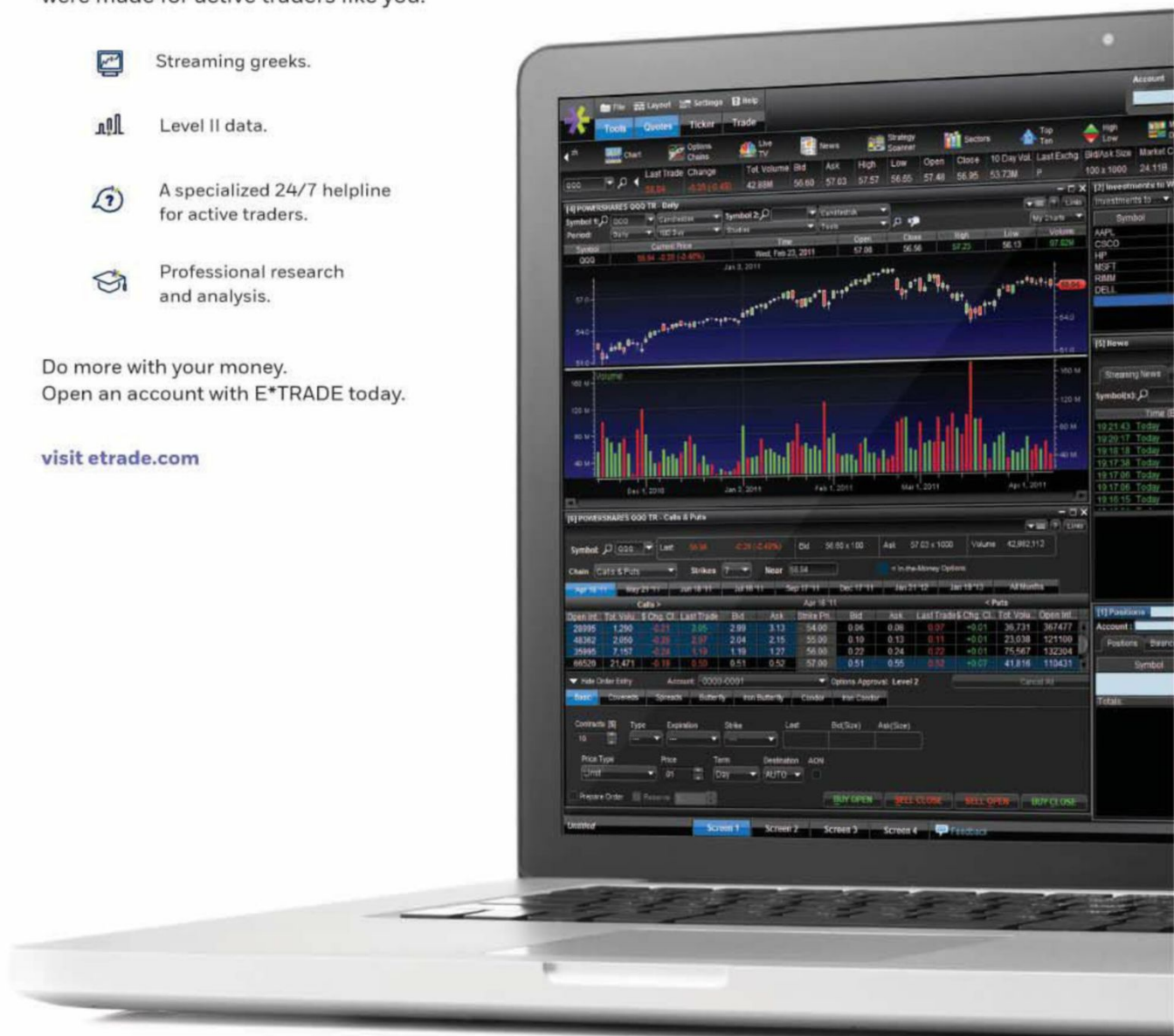
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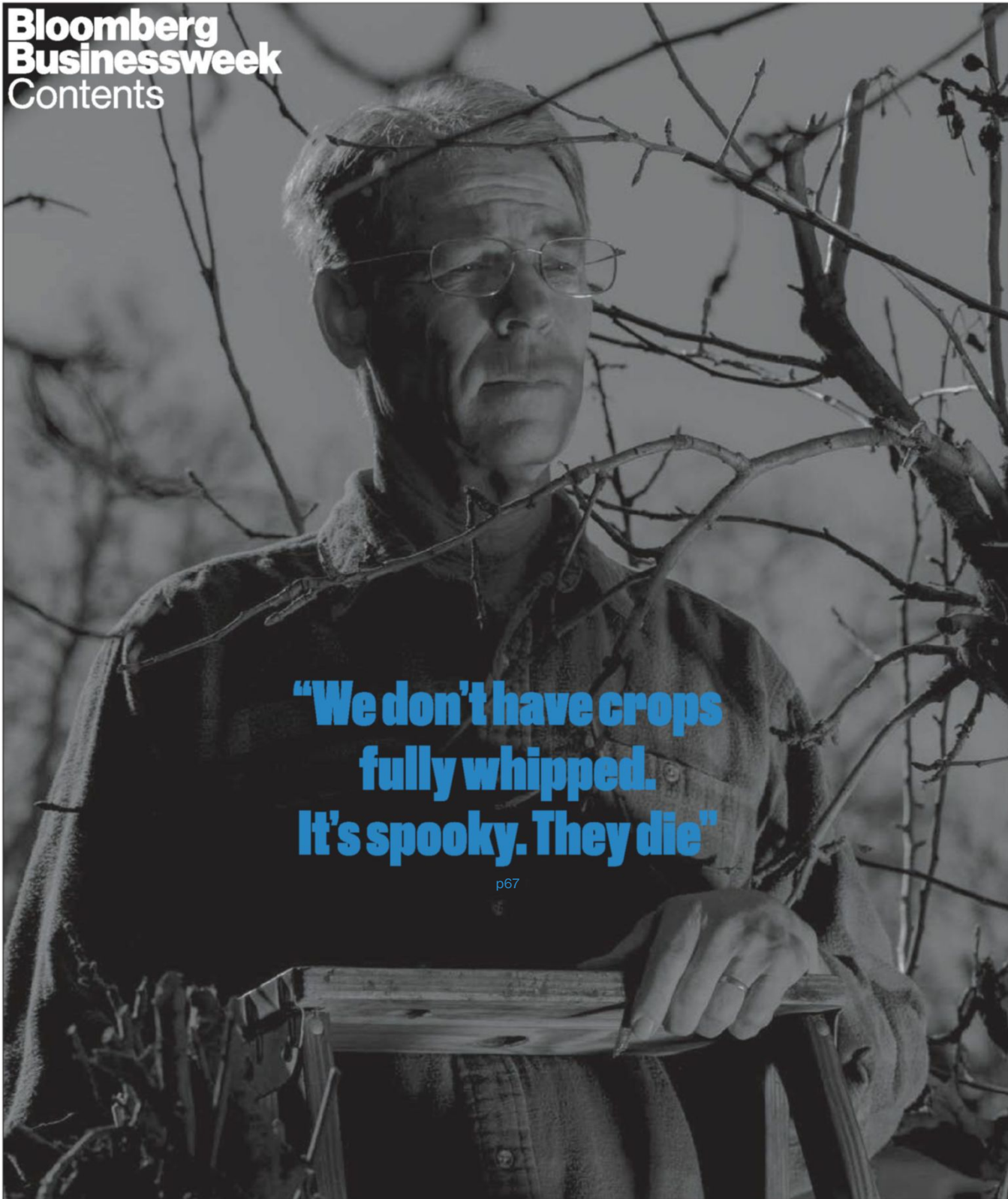


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It’s spooky. They die”**

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"The cover story is on how the tobacco industry is investing in new technologies for delivering nicotine."


"So they want to be more like a Silicon Valley startup, but with the purpose of creating something addictive and potentially destructive?"

"I suppose so."

"Sort of like Twitter."





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### Corrections & Clarifications

"How Much Is an Instagram Story Worth?" (Technology, March 6-March 12, 2017) should have reported that Beautiful Destinations posted a shot of the Empire State Building for the New York City tourist board, not the New York tourist board.





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By Peter Coy

Last April, lunching amid construction debris at his new hotel five blocks from the White House, Republican presidential candidate Donald Trump told the *Washington Post* he would get rid of the national debt “over a period of eight years.” It may have been the boldest promise he’s ever made, considering the U.S. hasn’t been debt-free since 1835. The debt at the time was more than \$19 trillion, and rising. Trump predicted he could turn back the tide even though he thought the country was headed for a “very massive recession.”

Now that he’s in the White House (and his hotel is open), he has a chance to make good on his commitment to wipe the slate clean. But there’s little evidence to date he’ll even make a serious stab at debt reduction. The real question is how much the debt will increase during his term—or terms—in office.

Based on what we know of his tax and spending goals, it appears likely to grow even faster under Trump than it was projected to rise before he took office.

Trump wants to slash personal and corporate income taxes, eliminate Obamacare levies, raise defense spending, build a border wall, renew infrastructure, and protect Social Security and Medicare from cuts. The cuts he does want—at the Environmental Protection Agency, for example—won’t save much money. “President Trump is inheriting a really bad situation. But to make the situation worse...the only justification is we don’t want to do the hard work of real budgeting,” says Maya MacGuineas, president of the bipartisan Committee for a Responsible Federal Budget.

Trump rejects the notion that balancing the budget requires painful choices. His *deus ex machina*—the miraculous solution to an intractable problem—is stronger economic growth, which would make it possible to cut tax rates and still raise more revenue. In September the Trump-Pence campaign issued a fact sheet saying its program would “conservatively boost growth to 3.5 percent per year on average.” In an October debate,

**He promised to be rid of the national debt in eight years. Good luck with that**



# Deficits in Trump's Future

Trump said, “I think you can go to 5 percent or 6 percent.”

His advisers seem to be pulling him to earth lately. He’s been citing 3 percent growth as a target, and the *New York Times* reported in February that his budget will assume 2.4 percent average growth. But even that is ambitious. The nonpartisan Congressional Budget Office projects potential growth of just 1.8 percent a year from 2017 through 2027, based on estimated annual growth of 0.5 percent in the labor force and 1.3 percent in the productivity of the labor force—i.e., output per hour of work. It will be hard for Trump to add to labor-force growth, especially given his planned controls on immigration and stepped-up deportations of undocumented aliens. His best hope is to boost productivity by using tax cuts to induce investment in machines and software—but even that would be insufficient, according to most simulations.

The Trump administration, in “thinking that you’re going to be bailed out by

growth,” is following in the footsteps of governments that couldn’t control their indebtedness, says

Harvard economist Carmen Reinhart. Standish Mellon Chief Economist Vincent Reinhart, Carmen’s husband and sometime collaborator, points to a 1991 essay, *The Macroeconomics of Populism*, by Rudiger Dornbusch and Sebastian Edwards. An initial burst of growth brings a sense of vindication to a populist regime, the writers found, but it’s soon followed by bottlenecks, inflation, and budget deficits, until “it becomes clear that the government is in a desperate situation.”

Trump likes to point out that Obama presided over a huge increase in the federal debt. But it made sense for the government to run deficits during and immediately after the 2007-09 recession. With its deep pockets and solid credit, the U.S. used that deficit spending to offset retrenchment by households and businesses, thus preventing an even deeper downturn. Now that the unemployment rate is below 5 percent, there’s less scope for stimulus. At least that’s the Federal Reserve’s position: Even before Trump has revealed his budget, the Federal Open Market Committee has indicated it’s on track to raise interest rates three times this year to prevent

## His administration plans to balance the budget with what he says will be huge gains in economic growth

inflationary overheating of the economy.

The levees holding back red ink are softer than usual. Republicans in Congress who prevented Obama from investing in infrastructure are keen to support Trump’s version of the same idea, for instance. “Historically, when one party controls both houses of Congress and the White House, the deficit goes up,” says William Gale, a senior fellow at the Brookings Institution. “You’ve got your hands in the cookie jar.”

The bond market’s “vigilantes”—investors who once pushed interest rates higher at the first sign of fiscal irresponsibility—seem unconcerned. Long-term interest rates did spike in November, but the yield on the 10-year Treasury note has settled around 2.5 percent in the last few months, still well below the historical average.

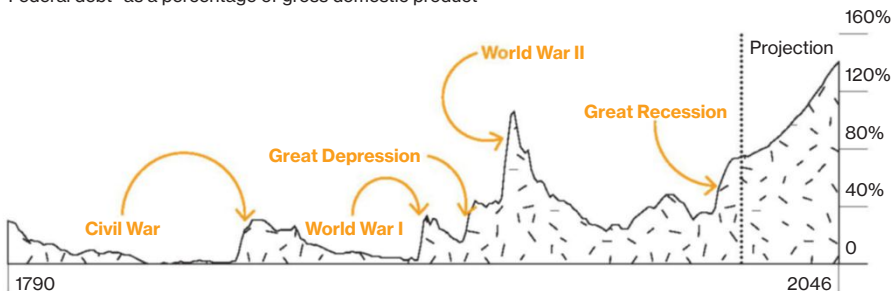
The general public has gotten blasé, too. Just 52 percent of Americans surveyed by Pew Research Center in January said reducing the deficit should be a top priority for the president and Congress, down from 72 percent who said so when Obama began his second term.

Trump won’t have a completely free hand, of course. Budget hawks in the House Freedom Caucus and Republican Study Committee could put up a fight over raising the debt ceiling. “These people feel fairly emboldened,” says JPMorgan Chase economist Joseph Lupton. “They don’t feel that this movement is dying.”

The best outcome for all concerned would be a high-performing economy. Columbia Business School Dean Glenn Hubbard, who chaired George W. Bush’s Council of Economic Advisers, says he supports the administration’s strategy of focusing first on growth. But things could get ugly if the promised boom doesn’t materialize. Trump’s agenda has to show success soon, Hubbard told reporters after a March 6 speech to the National Association for Business Economics in Washington. “Animal spirits will only take you so far,” he said. “Then you’re like Wile E. Coyote in the cartoon.” You realize there’s nothing beneath your feet, and it’s a long way down. **B**

### A History in the Red

Federal debt\* as a percentage of gross domestic product



## Germany Should Get With the 'Bad Bank'

Berlin worries its contributions would bail out non-German institutions. But that's the point



Some European regulators have come up with a viable plan to alleviate the chronic financial paralysis that affects the region. If only European politicians, particularly in Germany, would listen.

The European Union's leaders have spent much of the past decade debating—but never fully resolving—what to do about the huge pile of bad loans EU banks are sitting on, most recently estimated at more than €1 trillion (\$1.06 trillion). Nobody knows how large the losses will ultimately be, and that uncertainty spooks investors, inhibits lending, and undermines the European Central Bank's efforts to support economic growth.

A group of officials at the European Banking Authority—with the support of colleagues at the ECB and the euro area's bailout fund, the European Stability Mechanism—has put forth a proposal that could help: Create a publicly funded, pan-European “bad bank.” Its aim would be to dispel uncertainty by determining the fair value of soured assets and, with the assistance of private investors, to purchase a large portion of them.

The plan has several advantages. By forcing banks to recognize losses, it could trigger a much-needed restructuring of Europe's overcrowded banking sector: Unhealthy banks would have to either raise more capital or shut down. By averting a fire sale into illiquid markets, the plan would limit system-wide losses and make the whole reckoning less painful. The bad bank could even turn a profit for the governments that provide its capital.

Unfortunately, the EU's largest member, Germany, has withheld support for the plan, apparently concerned that its contribution would go toward bailing out banks in other countries. To which one can only ask: Isn't that the point? Part of the purpose of a pan-European bad bank is to enable the kind of risk-sharing needed to make Europe's banking union and common currency viable. The plan makes a concession on this score—if the bad bank can't sell assets for at least the price paid, it can claw back the difference from the

relevant bank or national government—but that's a weakness, not a strength.

Germany's intransigence is misguided. The country's officials are rightly skeptical that Europe's financial supervisory system, which was centralized under the ECB in 2014, will be tough enough to force closures and restructurings. Yet by opposing a European bad bank, they are depriving supervisors of an opportunity to do exactly that.

Granted, a lot depends on execution. The plan shouldn't delay Italy's effort to shore up its banks, and it should require all banks to raise the equity needed to make the whole system more resilient. If that's the goal, then Germany should give it a chance.

## China's Chance To Lead in South Sudan

As the U.S. takes a big step back, Beijing should provide more aid to the famine-stricken country

If South Sudan's famine is man-made—and it is—then maybe man can unmake it. Given the country's unstable government and the U.S.'s uncertain global leadership, however, most of the effort will have to come from China.

More than 40 percent of South Sudan's 11 million people don't have enough to eat, not because of drought or other natural causes, but because of their country's civil war, which started in 2013. Mayhem and disorder have taken tens of thousands of lives and forced more than 1.5 million to flee.

The U.S. has been the biggest provider of assistance to South Sudan, but Donald Trump seems unlikely to sustain that commitment. Nikki Haley, the U.S. ambassador to the United Nations, is rightly questioning whether it makes sense for the U.S. to continue paying the lion's share of a costly and ineffective UN peacekeeping mission. Yet the world can't simply abandon the country. Some 5 million South Sudanese, facing starvation or catastrophe through no fault of their own, deserve help. The instability, meanwhile, is affecting the country's neighbors.

The biggest outside power with the greatest practical interest in securing peace in South Sudan is China. Its companies have a 40 percent stake in the country's largest oil fields, which once accounted for 5 percent of China's oil imports. Before the civil war, dozens of other Chinese companies were active there, with thousands of Chinese managers and workers.

It's not as if China isn't involved; it has a large contingent of peacekeepers and has backed regional diplomatic efforts to solve the crisis. Still, it has more leverage left to use. China should insist on unimpeded aid, which South Sudan's government is blocking in areas controlled by its opponents. President Xi Jinping has made expansive pledges about cooperation with Africa and China's commitment to global leadership. South Sudan is one place where China can put its power and influence to better use. **B**



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# Movers

By Kyle Stock

▲ Facing greater competition from Amazon.com and others, **Hewlett Packard Enterprise** spent **\$1b** to buy **Nimble Storage**. HP says the flash specialist will help it diversify.

▲ **Adidas** shares surged to a record high after the company posted a 41 percent increase in profit in 2016 and raised its

forecast for earnings through 2020. Adidas seeks to double online sales and speed its supply chain to a fast-fashion pace.

▲ Twelve years after dropping out as a sophomore, Facebook founder **Mark Zuckerberg** will finally get a **Harvard degree**. He will also deliver the university's commencement address on May 25.



▲ **Nike** unveiled a sneaker designed to break the two-hour-marathon mark. The company says a springy carbon plate in the sole will boost a runner's speed by 4 percent.



▲ The for-profit space race is heating up, as **Jeff Bezos's Blue Origin** landed its first commercial customer. The company agreed to rocket a satellite into orbit for Eutelsat in five years.

▲ A sculpture by artist **Kristen Visbal** of a little girl facing off against the famous bull near Wall Street was installed on March 7, the day before International Women's Day. *The Fearless Girl* is part of a campaign by State Street Corp. to promote gender diversity on corporate boards.



▲ Uber Technologies is on the hunt for an executive chaperone. After arguing with a driver and later promising to "grow up," CEO **Travis Kalanick** said **Uber will hire a chief operating officer** to serve as his partner.

▲ **Logan**, the latest superhero film from 21st Century Fox, sold **\$247m** in tickets over three days. That's the **fifth-largest debut ever** for an R-rated movie.

▲ Train company **CSX** named as **CEO Hunter Harrison**, until recently the boss of **Canadian Pacific Railway**. In switching trains, Harrison forfeits **\$84m** in awards and benefits.

▲ Los Angeles voters rejected a ballot measure to place a two-year moratorium on the construction of tall buildings. It was opposed by the L.A. Area Chamber of Commerce, among others.



▲ **Mercedes-Benz** unveiled the world's most expensive SUV, priced at about **\$500,000**, at the annual auto show in Geneva. The **Maybach G 650 Landulet** has a convertible top, a 12-cylinder engine, and heated cup holders.

## Downs

▼ **Snap** shares fell almost 15 percent on March 7, just days after soaring during the company's IPO.

▼ In lieu of the five different types of physical tests they used to perform, **TSA** airport screeners began using a single, "more rigorous" pat-down.

"It should be very clear to the DPRK that it is a pariah, it is an outlier."

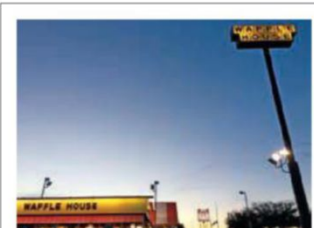
▼ **U.S. Disarmament Ambassador Robert Wood** had a stern reaction to the Democratic People's Republic of Korea lobbying four missiles into Japanese waters on March 6. More ▷ p16

▼ A **GOP** proposal to repeal and replace the **Affordable Care Act** drew skepticism from Republicans and conservatives. The bill would roll back Medicaid expansion and scrap mandates in favor of tax credits intended to prod people to buy their own insurance. More ▷ p29

▼ **WikiLeaks** published 8,761 documents, allegedly from the **CIA**, showing efforts to hack iPhones and turn TVs into surveillance devices. The agency says it doesn't comment on the authenticity of intelligence documents.

The glut of struggling apparel stores in the U.S. was the result of a burst retail bubble, says **Urban Outfitters** CEO **Richard Hayne**. On March 9, Urban's shares slid almost **9%**

▼ **ZTE**, a Chinese telecom giant, agreed to pay nearly **\$1b** to settle U.S. allegations that it violated sanctions in selling American technology in Iran. ZTE is expected to plead guilty as part of the settlement.



▼ **Joe Rogers**, who co-founded **Waffle House**, died at the age of 97. The chain of U.S. diners specializes in Southern-style breakfasts served 24/7.

# \$48.5b

▼ The **U.S. trade deficit** stretched to its widest point in almost five years in January, as American consumers snapped up foreign cars and cell phones. "We've been in a trade war for decades," Commerce Secretary **Wilbur Ross** said. "That's why we have the deficit." More ▷ p18



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<sup>1</sup> Exchange rate of 1 USD = ¥ 116.49 (JPY) as of December 31, 2016.

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March 13 — March 19, 2017



## Where Are All the Tourists?

15

► **The White House's diatribes against the Mideast and Mexico are keeping people away**

► **"Reputational fallout is a very real thing in the travel industry"**

Foreign tourists may be showing their displeasure with President Trump by planning to take their holiday dollars elsewhere. According to Tourism Economics of Wayne, Pa., the U.S. can expect 4.3 million fewer visitors from abroad in 2017 from a year earlier because of anger and anxiety triggered by Trump, especially over his original ban of travelers from mostly Muslim countries. That translates into

the loss of 62,000 jobs and \$7.4 billion in revenue, says Tourism Economics, which analyzes data to predict and measure travel activity for clients in government and private industry.

Since his first executive order on travel was struck down in court, Trump has revised the document, excluding Iraq from the list of banned countries, among other emendations. The new order will still likely trigger a

fresh round of legal objections from those who believe it's little changed from the first.

After the first order, high-profile episodes at U.S. immigration and customs checkpoints have included the Feb. 7 interrogation of boxer Muhammad Ali's son in Fort Lauderdale, Fla., and the detention of Australian children's book author Mem Fox at Los Angeles International Airport on



◀ Feb. 23. Travel industry representatives worry that such incidents add to the Trumpian tone of the times—and will further turn off would-be visitors. “It’s the president’s ‘America First’ rhetoric, the trade protectionism, the Mexican wall,” says Adam Sacks, president of Tourism Economics. ForwardKeys, which works with Tourism Economics, coined the phrase “Trump Slump” to describe the phenomenon.

New York City, which attracts more non-American travelers than any other place in the U.S., may see visits from overseas drop more than 2 percent in 2017, to 12.4 million, from last year. That would be the first decline after eight consecutive annual increases, according to the city’s marketing office. Although international travelers account for 20 percent of all visitors to the city, they spend about half of all tourists’ dollars. Officials say the loss of 300,000 international travelers would cost New York’s economy about \$900 million in direct and indirect spending. The city had been expecting increases in visits.

Los Angeles could lose about 800,000 international visitors and \$736 million in spending over the next three years “as a direct result” of Trump’s immigration policy, mostly because of reduced travel by Mexican nationals, says Ernest Wooden Jr., president of the Los Angeles Tourism & Convention Board. The president’s vow to force the U.S.’s southern neighbor to pay for a wall has infuriated Mexico, where campaigns are calling on consumers to scrap U.S. vacations and boycott its products.

Tourism Economics reported that bookings to the U.S. from Western Europe decreased 14 percent from Jan. 28 to Feb. 4, compared with the same period a year earlier. From

the Middle East, which was targeted directly by the first ban, bookings were down 38 percent in the same period. The surprise exception was Russia, where favorable coverage of Trump has been notable. Russian travelers increased their searches for airfares on U.S.-bound flights by 66 percent.

Trump, who’s been in the hotel business for years, should understand the risks to the U.S. economy if foreign tourists spend their money elsewhere, says Jonathan Grella, director of public affairs at the U.S. Travel Association. “Reputational fallout is a very real thing in the travel industry.” U.S. Commerce Department spokesman Tim Truman says he can’t comment on the industry’s worries until May, when the federal government receives data on January’s international arrivals.

The U.S. has slid three spots, to seventh place, in the 2017 best countries survey of how nations are perceived globally. The survey is sponsored by U.S. News & World Report, BAV Consulting, and the Wharton School and began polling after the election. Almost three-quarters of respondents said they had lost some respect for U.S. leadership.

Anxiety about Trump has stimulated anti-U.S. sentiment even in friendly countries, affecting the appetite for travel to the U.S. On Feb. 27 during carnival in Rio de Janeiro, Elvis Presley, Abraham Lincoln, and 150 Beyoncé impersonators paraded alongside a giant shimmering Statue of Liberty on Brazil’s biggest stage. But the U.S.-sponsored float did little to cheer up Brazilians, who face the same tight visa rules for travel to the U.S. as other countries. “The only thing that’s dispiriting is Trump,” said Tatiana Maciel, a carnivalgoer. “I wouldn’t be welcome in the U.S. anymore.” Roberto DaMatta, an anthropologist with Rio’s Pontifical

Catholic University and professor emeritus at Notre Dame, says, “Everyone I’ve spoken to is horrified by Trump.”

Almost as if scripted, the highest level of another U.S.-sponsored float collapsed, injuring more than a dozen performers. And just like that, the demonstration of U.S. soft power was derailed. Brazilian television commentators spoke of little else. —Henry Goldman and David Biller

**The bottom line** Flight bookings for U.S.-bound tourists have dropped steeply from a year earlier, raising the fear of an extended downturn.

## Trade

### Beijing Is Mad About Thaad

▶ **A U.S.-installed antimissile system in South Korea raises China’s ire**

▶ **“It is hard to receive even a single Chinese group tour bus”**

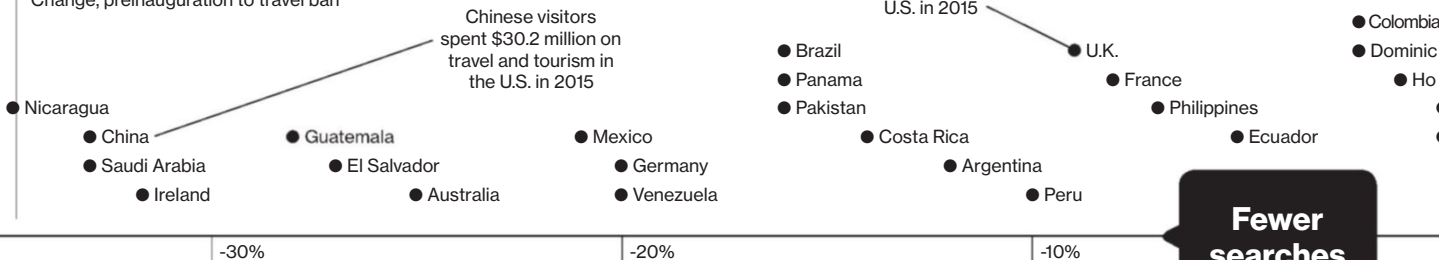
On the South Korean resort island of Jeju, about 85 percent of foreign visitors last year came from China. They piled into tour buses to see a botanical garden, a teddy bear museum, and a concert hall full of singing holograms, among other sites.

That was before the U.S. on March 7 announced it had started deploying the Terminal High Altitude Area Defense system in South Korea. While Thaad is supposed to be a shield against North Korean missiles, China views it as a security threat.

To show its displeasure, the China National Tourism Administration has ordered travel agents to stop selling tour packages to South Korea starting on March 15, according to the

### Weekly average web searches for flights to the U.S.

Change, preinauguration to travel ban



**Fewer searches**



state-run Korea Tourism Organization.

The impact of China's actions is already being felt on Jeju. "We've seen about a 20 percent decline in Chinese tourists this year," says Byun Chang-sik, a general manager at the Teddy Bear Museum. Play KPop, a museum that opened in 2015, features a concert hall for singing holograms, as well as selfie-taking areas with photos of singers including Park Jae-sang, the artist known as Psy whose *Gangnam Style* was an international hit in 2012. "We've suffered direct damage," says Kang Oh-hyun, a museum official. "It is hard to receive even a single Chinese group tour bus these days."

Almost 3.1 million Chinese visited Jeju last year. "This will strike a fatal blow," says Won Hee-ryong, governor of Jeju Special Self-Governing Province.

Tourism is one of many Korean industries to suffer. China's major internet-streaming companies have pulled popular Korean soap operas and dramas off their platforms, China's state-run *Global Times* newspaper reported on March 5. And Chinese government pressure could eventually hurt sales of Korean cars, mobile phones, and chemicals, says Kim Kyung-hwan,

a strategist at Hana Financial Investment Co. in Seoul. "We're estimating a 5 to 10 percent decline in exports to China," Kim says. "Even if China withdraws all the restrictions, it will take six months to a year for things to improve."

When China disputed Japan's claims to uninhabited islands near Taiwan in 2012, angry Chinese attacked a Toyota dealership. Japanese carmakers' sales in China took a year to recover. "China is more and more interested in using the power of the purse of its consumers as a force multiplier for its diplomatic pressure," says James Reilly, associate professor in the University of Sydney's department of government and international relations.

The Thaad system will be installed in South Korea on a former golf course provided by retail and leisure conglomerate **Lotte Group**. After the announcement of Lotte's involvement, the group's Chinese website was hacked, and Chinese authorities suspended the operations of 55 Lotte Mart stores because of alleged violations of fire-safety rules. South Korea's trade minister said on March 5 that the country would take legal steps if China violated World Trade

Organization or Korea-China free-trade agreements.

Down the street from the Teddy Bear Museum, restaurant owner Jeong Jong-soo is bracing for worse to come after China imposes the travel restrictions. "We cannot endure this situation for long," she says. "I feel I am walking through a dark tunnel." —Bruce Einhorn, Sohee Kim, and Kyunghee Park

**The bottom line** The Chinese believe the Thaad antimissile system, now being installed in South Korea, threatens the balance of power in Asia.

Belief

## The Hand of Iran In Nigeria

► **The Pentagon signals unease over Iran's growing influence**

► **"Sheikh Ibrahim was alone. Now there are millions"**

Nigerian carpenter Bashir Muhammad has never been to Iran, but he would fight to the death for the country. "If Iran wants our help, we are ready to go and help it, even with our blood," he says. "Donald Trump needs to know that Iran has followers all over the world ready to help defend it against America."

The 30-year-old is among an increasing number of converts to the Shiite branch of Islam that Iran has been proselytizing since its 1979 revolution. Touring the unpaved streets of Zaria in Nigeria's predominantly Muslim north, Muhammad exudes a fervor that shows Iran's success in building enclaves of support beyond the Middle East—and the limits of any foreign policy planned by the U.S. president to contain it. ►



PHOTO ILLUSTRATION BY 731; PHOTOS: GETTY IMAGES (3), COURTESY U.S. MISSILE DEFENSE AGENCY (2)

● India — The average trip of an Indian visitor is 35.3 days

an Republic  
nduras  
► Israel  
► Italy

● Jamaica  
● Japan  
● Spain

**More searches**

10%

20%

30%



U.S. flight searches in Russia are up

**66%**

● Belarus

◀ In this case, Iran's influence has reached into Africa's most populous nation, a major oil producer. Nigeria is also a country where the battle for supremacy in the Islamic world—which pits Shiite Tehran against Sunni Riyadh in the Middle East—could escalate into another conflict. Nigeria's Muslims, who make up 45 percent of the country's almost 190 million people, are mainly Sunnis, so Iran's growing influence has alarmed the Saudis and Americans.

Trump has labeled Iran “the world's top sponsor of terrorism.” The Pentagon is monitoring Iranian activities in Nigeria and West Africa. Saudi diplomatic cables released by WikiLeaks reveal concerns about Iran-backed Shiite expansion from Mali, Mauritania, Burkina Faso, and Nigeria in West Africa to India and China in Asia.

To counter the Shiites, the Saudi cables suggested sending more Nigerian students on scholarships and increasing support to regional Sunni Muslim centers. Recently, two Saudi clerics—including an adviser to the royal court—visited the Nigerian capital, Abuja.

No one knows how many Nigerian Shiites there are. Local Shiites put the number at 20 million, while Sunnis say there aren't even a quarter of that.

Iran's missionary work in Nigeria began with a Sunni Muslim university activist, Ibrahim El-Zakzaky, who was so impressed with the Iranian revolution that he wanted one at home. When that didn't happen, Zakzaky went to Iran. At some point he became a Shiite and later started wearing the white turban of a cleric. He became the leader of the Islamic Movement in Nigeria.

“Sheikh Ibrahim was alone,” says Muhammad, the carpenter. “Now there

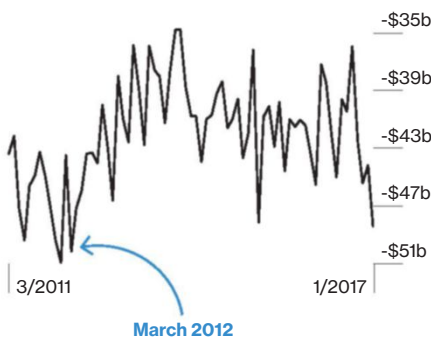
A Shiite school run by the Islamic Movement in Kano, Nigeria



## Indicators America's Trade Imbalance Grows

President Trump's promise to slash the U.S. trade deficit looked like a taller order as of March 7, when the U.S. Department of Commerce said the gap in goods and services jumped 9.6 percent in January, to \$48.5 billion, the highest level since March 2012. —Peter Coy

### U.S. trade balance in goods and services



DATA: U.S. CENSUS BUREAU

are millions.” Muhammad converted after attending two lectures a day over several weeks by the cleric. Iran has been funding Zakzaky for years, and the area of Zaria he worked in became the “mecca for the dispossessed in Nigeria,” according to Matthew Page, a former U.S. State Department specialist on Nigeria.

Instead of enriching himself, Zakzaky funded a soup kitchen and homeless shelters, Page says. “This was a very inexpensive way for Iran to have a toehold in Nigeria.” The Islamic Movement of Nigeria boasts more than 300 schools, religious centers, a newspaper, and a “martyrs’ foundation” to support orphans and finance health facilities. The network is similar to welfare systems established by Hezbollah, the Shiite militant group in Lebanon supported by Iran.

Such activities show conventional sanctions on Iran won't work, says Ghanem Nuseibeh, the founder of London-based consultants Cornerstone Global Associates Ltd. “You're talking about a geopolitical conversion and politicizing chunks of Muslim populations around the world who have previously no relations with Iran or Shiism,” he says. “You might be able to formally increase sanctions on Iran, but Iran has tentacles that go beyond its borders.”

While few Nigerians talk of importing war from the Middle East, tension escalated when government troops

killed more than 300 Shiites in Zaria in December 2015 and arrested Zakzaky and hundreds of followers. The army accused Zakzaky's group of attempting to kill the army chief of staff while his convoy was passing, a charge the movement denies. Shiites hold regular protests in Abuja and other cities demanding Zakzaky's release.

The Sunni-majority regional government that covers Zaria said last year it foresaw a “possible intensification of intra-Muslim conflicts.” Potentially more alarming for the U.S. and Saudi monitors, the report said the Islamic Movement maintains a paramilitary outfit that is in “constant conflict with law enforcement agencies, the local residents, and innocent bystanders.”

The sectarian tensions add to Nigeria's woes. For the first time in 25 years, the OPEC member's economy shrank in 2016 because of the slump in oil prices. The stock market is sliding, and the currency is at a record low.

Asked if the U.S., with all its might, would prevail in any confrontation with Iran, Shiite cleric Sanus Abd-Qader says, “Iran will be steadfast if there's a war. The strong always prevail.” —Donna Abu-Nasr

**The bottom line** Along with a contracting economy and other problems, Nigeria must deal with a Shiite movement supported by Iran.





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March 13 — March 19



## Selling China On Cheese

20

► **Big dairy importers are training chefs to use new ingredients**

► **“You would rarely see Chinese adults drinking milk”**

In an industrial kitchen in a suburb of central Shanghai, a quiet culinary revolution is taking place. Chefs are experimenting with exotic ingredients supplied by New Zealand’s **Fonterra Co-operative Group Ltd.**: mounds of butter the size of bread loaves and 5-kilogram (11-pound) cheese wheels.

Butter, cream, and cheese are seldom used in commercial Chinese kitchens, but dairy exporters are working to make them ubiquitous in China.

In Hong Kong, where more than a century of British rule helped inspire such dishes as cheese baked rice and buttered pineapple buns, dairy

accounts for about 5 percent of the ingredients used in catering, according to Dutch dairy cooperative **Royal FrieslandCampina NV**. Supplying that amount would create a \$7.5 billion annual market in China.

Fonterra, the world’s biggest dairy exporter, began training Chinese chefs



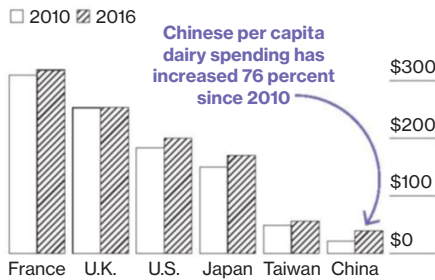
in 2015 and now hosts workshops in Beijing, Chengdu, Guangzhou, and Shanghai for hotels and schools, companies such as Starbucks Corp. and General Mills Inc., and local chains Holiland bakery and Champion pizza. FrieslandCampina has joined the butter bandwagon, opening a training kitchen in Shanghai in January to teach cooks how to incorporate milk-based products in popular dishes. “We can see the rise of the middle class and the openness and adjustment to Western foods,” says Batthew Pang, the company’s vice president for food service in China. “We haven’t had this scale of potential growth in food service anywhere else.” Fonterra sold the equivalent of 271 million liters (72 million gallons) of milk in consumer and food-service products to China in the quarter ended Oct. 31, a 36 percent increase from a year earlier, the company said in November. “A new generation of mainland Chinese has become more admiring of, or adapted to, Western culture, especially in eating,” Pang says.

At \$150 billion a year, China’s food-service industry—a separate sector from consumer food sales that’s centered on restaurants and caterers—is the world’s largest after those in the U.S. and Japan, and Western-style cuisine is growing in popularity, says Sally Peng, senior account manager with research firm NPD Group in Shanghai.

On a recent visit to Fonterra’s Shanghai kitchen, one food technician was comparing and contrasting the stretchiness of different lines of mozzarella on pizza, while another slathered whipped cream onto a cake to evaluate how long the cream stayed emulsified. The aim, the company says, is to help chefs become more confident working with dairy ingredients and, ultimately, to use them more. It’s the most proactive way Fonterra and FrieslandCampina see to open up the market.

Still, the Chinese population is unlikely to consume dairy on a per capita basis to the extent Americans do, says Jack Chuang, a partner for Greater China with OC&C Strategy Consultants, a global business consulting firm. “You would rarely see

### All the Cream in China



DATA: EUROMONITOR INTERNATIONAL

Chinese adults drinking milk,” he says. “Alternative dairy products—like nut milks, which are popular in the U.S.—have always been a staple in China.” Studies have shown that a high proportion of Chinese are unable to absorb lactose, the main carbohydrate in milk, which can cause bloating, flatulence, cramps, and nausea. Intolerance to lactose is becoming less of a problem as more people are exposed to milk products at a younger age, Pang says.

Fonterra’s sales to caterers and restaurants in China are increasing more than 10 percent per year, according to Christina Zhu, the company’s local managing director. Its sales of mozzarella surged 66 percent last year. China now accounts for a quarter of the company’s food-service business. Fonterra says that figure will expand as the company targets NZ\$5 billion (\$3.5 billion) in global revenue from the segment by 2023, Zhu says.

Selling directly to the restaurant industry is a lower-value business, with a profit margin 20 percent to 50 percent less than selling branded dairy products to consumers via supermarkets and retail stores, according to FrieslandCampina’s Pang. Overseas companies have had a hard time breaking into the \$52 billion consumer market, which is dominated by local dairy suppliers **Inner Mongolia Yili Industrial Group Co.** and **China Mengniu Dairy Co.**, according to Euromonitor International Ltd. Switzerland’s **Nestlé SA**, which opened its first factory in China in 1979, has a 2 percent share, Euromonitor data show. Fonterra was hurt by a 2008 joint venture with local outfit **Sanlu Group Co.**, which ended when the

company blew the whistle on Sanlu’s melamine-tainted baby formula that killed at least six infants.

With food service, dairy importers’ efforts to raise the profile of their products is resulting in concoctions like Peking Duck pizza and mooncakes filled with cheese instead of traditional lotus paste. “When we first entered here, people didn’t know how to make cakes with the cream and butter we had, and we had to help them with that,” Zhu says. Today, Fonterra’s cheese tops more than half of all pizzas in China. “Now is the window to build your brand with this segment of customers,” she says. “I think it’ll be a lot harder to compete in five years when the market is more established.” —*Bloomberg News*

**The bottom line** China’s growing consumer dairy market is more lucrative but tougher to break into for importers than its food-services industry.

### Product Liability

## The Lawsuits Keep Coming for J&J

▶ **At least 17 upcoming trials allege product defects**

▶ **“We believe we have strong grounds for reversal”**

**Johnson & Johnson** was hit with six of the seven largest product-defect verdicts of 2016, and 2017 could also wind up costing the company hundreds of millions of dollars, if not more.

The company is facing at least 17 trials in state and federal courts this year in cases blaming five J&J products for injuries and death. They follow trial losses on some of those products, including a \$1 billion verdict against the company in December over hip implants and an earlier \$72 million verdict over claims its talcum powder causes ovarian cancer.

While litigation is routine for drug-makers, including Johnson & Johnson—the total number of pending claims against the company is 100,000 and growing—the pileup of bad verdicts is rare. With \$42 billion of cash ▶

◀ on hand, analysts aren't itching to change their buy ratings, says Jason McGorman, an analyst with Bloomberg Intelligence, but the mushrooming caseload combined with product recalls and little innovation have affected growth and earnings. "I think that has been part of what has weighed on J&J's shares the past few years," McGorman says. Jeff Jonas, a portfolio manager at Gabelli Funds LLC, says the verdicts have also caused some reputational damage.

J&J disputes the claims in the suits and is fighting them, says spokeswoman Samantha Gilham. The coming cases include the first trials, starting in April, about claims that blood thinner Xarelto causes uncontrolled bleeding. In Philadelphia state court, at least three trials are set over allegations that the antipsychotic drug Risperdal causes boys to develop female breasts.

Two hip-implant verdicts last year, the aforementioned \$1 billion suit and another for \$500 million, were reduced by judges after trial. J&J is appealing those verdicts as well as the others of 2016. "We believe we have strong grounds for reversal," Gilham says.

The real danger isn't the losses or even the risk of this year's trials, legal experts say. Rather, it's that more bad verdicts could encourage others to file, raising the costs of fighting and settling.

Some of the trials will serve as test cases for what the company might have to pay. In December, J&J lost an appeal to throw out an \$11.1 million award to a South Dakota woman who sued over the pain caused by the company's vaginal mesh implant, used to strengthen weak pelvic muscles. Almost 55,000 claims over the mesh are pending in courts across the U.S. New cases over the various products at issue in all the trials are continually being filed, J&J

said in a securities filing on Feb. 27.

Winning could lead plaintiffs to drop their cases and discourage new filings, while a continued losing streak would put J&J at risk for even bigger losses. "The initial strategy should always be to litigate vigorously, not give an inch or settle prematurely," says Anthony Sabino, a law professor at St. John's University. —Margaret Cronin Fisk and Jef Feeley, with Joel Rosenblatt

**The bottom line** Snowballing product-defect cases could lead to more big verdicts and encourage additional suits against J&J in 2017.



## Television

### Telemundo's Ratings Are Made in the USA

▶ Competition heats up as rival Univision's audience declines

▶ "We're making content specifically for Hispanics living in the U.S."

The biggest shows on Telemundo this season don't look anything like the soap operas that have long dominated Spanish-language TV in the U.S. There's no poor girl pining after a rich guy, no passionate arguments ending in a slap across the face. Instead, there are docudramas such as *Hasta Que Te Conocí*, chronicling the life of Mexican musician Juan Gabriel, and crime shows such as *El Chema*, about an international drug kingpin whose story occasionally resembles that of real-life crime lord Joaquín "El Chapo" Guzman.

The programs have made NBCUniversal's Telemundo a top performer. While industry leader Univision Communication's audience has declined sharply in the past three

years, Telemundo's is growing.

For one week in July, the network beat Univision for the first time ever among 18- to 49-year-olds in prime time; it did so again in that demographic for the last four months of the year. "There was a time when it was almost unthinkable that we'd ever beat Univision," says Steve Burke, chief executive officer of NBCUniversal, the entertainment division of **Comcast Corp.**

For many years, Univision dominated Spanish-language TV by importing *telenovelas*, dramatic soap operas made largely by Mexico-based **Grupo Televisa S.A.B.**, the largest producer of Spanish-language TV and part owner of Univision. The network held about three-fourths of the market in 2001, when NBC bought Telemundo. Today, Univision and Telemundo are neck and neck, though as **YouTube**, **Netflix Inc.**, and other competitors lure away viewers, the overall audience for both networks is smaller than in 2010.

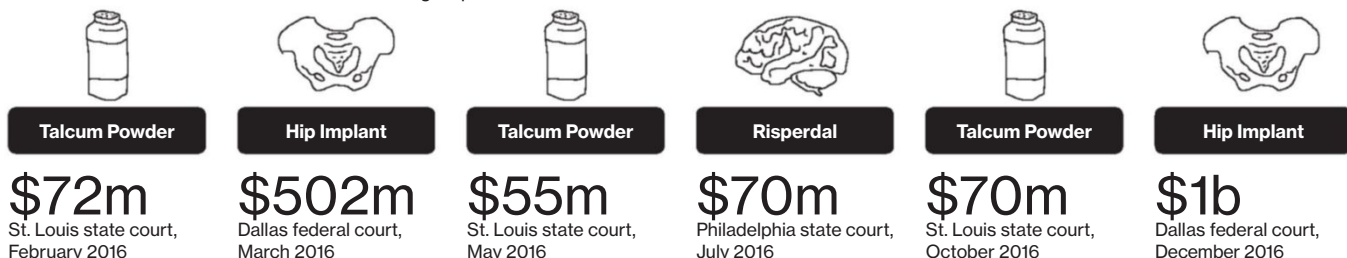
Telemundo started producing its own shows in 2003. "We're making content specifically for Hispanics living in the U.S., and it's being made by Hispanics living in the United States," says Cesar Conde, chairman of NBCUniversal Telemundo Enterprises. The company produces many of its shows in Miami. Almost all of Univision's Televisa programs are made in Mexico.

Last year, Telemundo generated \$2.1 billion in revenue and \$263 million in profit, according to David Joyce, an analyst at Evercore ISI. It could double those figures in the next few years by charging pay-TV providers about the same rates Univision does, Burke says. Univision charges about \$1.25 per subscriber, while Telemundo charges about 25¢, according to an estimate from SNL Kagan.

Telemundo's news programming

### A Pileup of Big Verdicts

J&J's 2016 trial losses included six of the seven largest product-defect verdicts





has also contributed to the ratings increase. A town hall on Feb. 12 about President Donald Trump's immigration policies, moderated by network news anchor José Diaz-Balart, led the prime-time ratings that night for Spanish-language TV.

A fierce competition now exists between Telemundo and Univision where once there was none, says Lisa Torres, president of multi-cultural marketing for ad buyer Publicis Media. "It is an hour-by-hour, show-by-show race," she says.

Univision, tied to Televisa's programming, has struggled. The network's viewership dropped 48 percent from 2013 to 2016 among 18- to 49-year-olds in prime time, though it regained the top spot in January and February. An initial public offering by parent company **Univision Holdings Inc.** has been long delayed.

To reverse the trend, Univision appointed Isaac Lee, chief content officer, to oversee Univision and Televisa's recently combined programming units. It acquired the U.S. broadcast rights to European soccer's UEFA Champions League. It's investing in English-language shows with American settings and programs from other producers, including a mini-series co-produced with Netflix about El Chapo, who's awaiting trial in the U.S. after a series of prison escapes. Lourdes Diaz, Univision's president of entertainment, says the network is also focused on creating characters that speak to U.S. Latinos.

Undeterred, Telemundo is thinking bigger than ever. In January the network and NBC's Universal film unit announced they would make movies for English- and Spanish-speaking audiences. Telemundo's building a \$250 million headquarters in Miami. It bid \$600 million to win the U.S. Spanish-language rights to the 2018 and 2022 World Cup tournaments. Univision has broadcast every World Cup since 1970. "That to me was the first message to the world that, 'OK, these guys are serious,'" Burke says. —*Gerry Smith*

**The bottom line** Ratings for NBCUniversal's network are starting to surpass those of Univision, long the dominant U.S. Spanish-language channel.

**B** Edited by Dimitra Kessenides and David Rocks  
Bloomberg.com

# General Motors

By Chad Thomas and David Welch

## A Continental Retreat

**After almost nine decades in Europe**, the Detroit giant is selling its European unit, Opel, to France's PSA Group, the maker of Peugeot and Citroën. The deal creates the region's No. 2 seller of cars (behind Volkswagen AG) and effectively revives an alliance the companies abandoned in 2013.

**Fuzzy Math**

The sticker price is **\$2.3 billion**, for which PSA gets Opel, Vauxhall Motors, and (together with BNP Paribas bank) GM's European finance business. GM, in turn, will give PSA \$3.2 billion upfront for current worker pensions and spend \$400 million annually for the next 15 years to cover payments to Opel retirees. Barclays Bank Plc figures the bottom line is that GM is paying Peugeot \$600 million to take Opel off its hands.

**The New Company**

Together, PSA and Opel have **16 percent** of the European market, which will help them spread development costs across a larger number of vehicles.

### The Background

Opel has lost almost

# \$20b

since 1999, and the future looks tough given its focus on low-margin cars and its facilities in high-cost countries such as Germany, Britain, and Spain. Worse, European automakers have the production capacity to manufacture far more vehicles than are sold annually in the region, which keeps a lid on prices.

### The Politics

The deal will have to be approved by unions, especially in France and Germany, where workers are guaranteed a say in major decisions. And the French government will be a key shareholder, because it took a stake in PSA following a rescue in 2014.

### The Factories

The deal brings together 28 PSA and General Motors plants in nine countries.

- GM (Opel, Vauxhall)
- PSA (Peugeot, Citroën, DS Automobiles)



**End of an Era** GM in 2013 pulled Chevrolet out of Europe, so the sale largely brings to a close an adventure it began in 1929 with the purchase of Opel—at the time Germany's biggest automaker.





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March 13 — March 19, 2017

# A Tax Showdown At the Border

► Part of the GOP's plans to overhaul the tax code divides corporate America

► "The hard reality is the border tax is on life support"

Bad  
news  
for...



Good  
news  
for...



Since Donald Trump's surprise election victory, the president and Republican leaders in Congress have described tax reform as a top priority—a once-in-a-generation chance to overhaul the tax code in a way that lowers rates for companies and individuals, encourages businesses to make things at home instead of abroad, and ends incentives for companies to book profits overseas. All without raising the budget deficit.

Republicans in Congress, led by House Speaker Paul Ryan, have come up with what they believe is a key part to the solution: a border adjusted tax, or BAT. Their plan proposes scrapping the 35 percent corporate rate, one of the highest in the world, and replacing it with a 20 percent rate that applies to profits from domestic sales and to imported goods and materials. Money earned from exports would be exempted from a company's taxable income—effectively letting U.S. sales abroad go tax free. By taxing imports the plan would raise about \$1.1 trillion in federal revenue over a decade—enough to offset the revenue losses from lower tax rates.

Sounds great, right? Except there's a reason the tax code hasn't been fundamentally changed since the Reagan administration. Entire industries and business models have been built around tiny nuances of the rules, so any change creates big winners and losers. And sure enough, political and corporate forces have mobilized to take sides in what has become the biggest tax fight in almost four decades.

Companies that rely heavily on exports, such as **Boeing Co.** and **Oracle Corp.**, love the plan—for

◀ obvious reasons. Beyond profits, they also say a BAT would make American manufacturers more competitive by putting them on equal footing with foreign competitors around the world.

Importers hate the BAT. Big retailers such as **Walmart Stores Inc.** and **Best Buy Co.** contend that border adjustments will dent profit margins and force them to raise prices on everything from avocados and furniture to Nike shoes and French cheese. In a Feb. 28 letter to congressional leaders, the Americans for Affordable Products coalition said the tax would raise consumer costs “by as much as \$1,700” in the first year.

To counter that argument, exporters and pro-BAT groups say border adjustments would cause the U.S. dollar to strengthen over time. A stronger dollar would lower the cost of imports, helping to offset the effects of the tax.

Well, that’s the theory. A border

adjusted tax of the type House leaders envision has never been put to the test in the real world. Importers say they haven’t seen much benefit from a stronger dollar in the past. “If I see any price reduction due to a

stronger dollar, it is a minor miracle, and it will probably take a year or more of arguing with my suppliers,” says Don Chernoff, founder of **SkyRoll Luggage Co.**, a Reston, Va.-based company that imports its luggage from Thailand. “In the end I get mostly zero benefit from a stronger dollar. The academic economists never seem to understand any of this reality.”

One such economist, Alan Auerbach of the University of California at Berkeley, argues that by focusing on the interplay of imports and exports, BAT critics miss the point. Border adjustments, he says, will boost domestic production while reducing incentives for companies to shift profits overseas, where they’re untaxed by the U.S. until brought home.

Companies are taking their message to consumers. In late February the National Retail Federation, which opposes the BAT, started airing TV commercials that parody an OxiClean

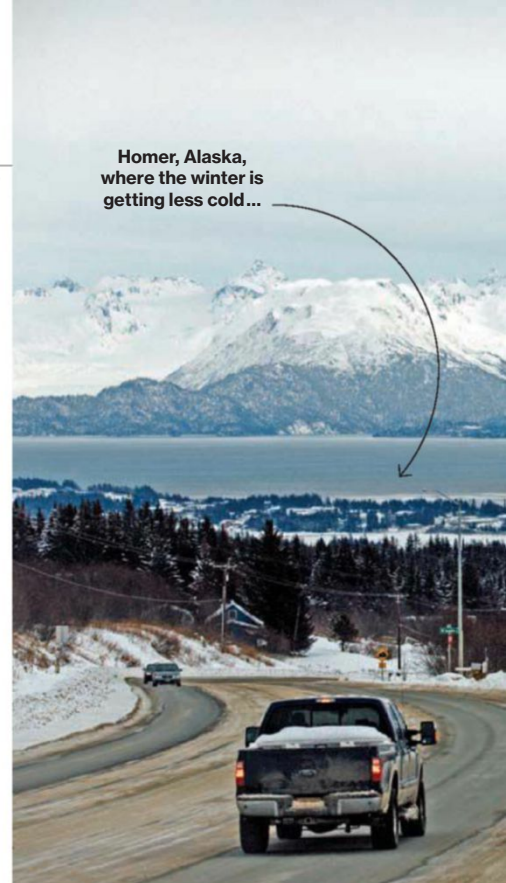
infomercial, telling shoppers that “the all-new BAT tax is specially designed to make your disposable income—disappear!” Proponents, through the American Made Coalition that includes **Johnson & Johnson** and **Pfizer Inc.**, launched a Twitter feed to support the tax. Both sides have created Facebook pages and websites with auto-form letters that viewers can send to Congress. Both, too, routinely pepper media outlets with press releases citing prominent people in the private sector and academia who either love or hate it.

The politics are no less complicated. Texas Representative Kevin Brady, the Republican chairman of the tax-writing House Ways and Means Committee, has been on a media blitz since the start of the year to sell the concept to the public and fellow lawmakers. So far he’s struggling. A core group of House Republicans has come out in recent weeks against the BAT, citing the higher prices they’d inflict on consumers.

Republican Senate support is in doubt, too. Tom Cotton, a Republican from Walmart’s home state of Arkansas, told a Senate floor session on Feb. 15 that border adjustments are “a theory wrapped in speculation inside a guess.” The next day, Senate Majority Whip John Cornyn, a Texas Republican, said, “The hard reality is the border tax is on life support.”

The big question is where Trump stands on Ryan’s plan. Senior advisers seem split: Trump’s chief strategist, Steve Bannon, is an enthusiastic supporter of border adjustments, while National Economic Council director Gary Cohn and Treasury Secretary Steve Mnuchin are said to be against them. In a Bloomberg TV interview on March 8, Commerce Secretary Wilbur Ross indicated he’s still on the fence. “As we get to understand more of the intricate details of it...that’s when we will take a position,” he said.

Ryan and Brady aren’t backing down. Without border adjustments, they say, their plan to rewrite the tax code can’t happen. That \$1.1 trillion in revenue is crucial to the politics of the BAT, since it helps keep it deficit-neutral, a prerequisite for passing a tax bill through the Senate without Democratic votes. “What it boils down to is that it’s a way to pay for the rest of the tax plan,” says Veronique de Rugy, an economist at George



Homer, Alaska, where the winter is getting less cold...

Mason University. “Only revenue comes from this feature—economic growth doesn’t.” That \$1 trillion is also crucial to how the BAT might affect the economy. Says Ross, “That is way too big a number to get wrong.” —Lynnley Browning, with Sahil Kapur

**The bottom line** A border adjusted tax would cut the 35 percent corporate rate to 20 percent but tax imports, leaving clear winners and losers.

## Climate Change Alaska’s Big Problem With Warmer Winters

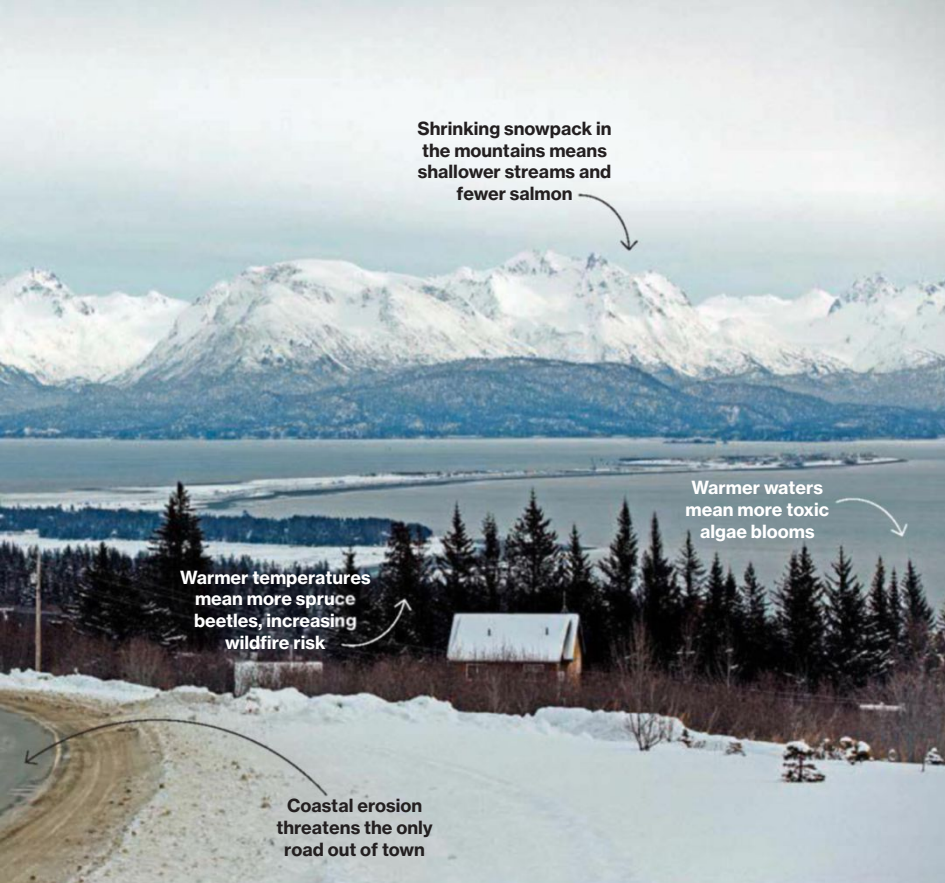
- ▶ Juneau has no plan, little money for erosion or thawing permafrost
- ▶ “Environmental change is not a theoretical” in the state

The wind that comes off the mountains across Cook Inlet in southern Alaska still feels plenty cold in February. But lately it’s not quite cold enough. From 1932 to 2017, the daily minimum temperature in Homer, a city on the eastern shore of the inlet, averaged 19F in February. Narrow that to the past 10 years and the average rises to 21F; for the past five years, 25F. Last February, Homer’s daily low averaged 30F—just

**\$1.1**  
trillion

Revenue that the border adjustment tax would raise over a decade to offset lost revenue from lower tax rates





Shrinking snowpack in the mountains means shallower streams and fewer salmon

Warmer waters mean more toxic algae blooms

Warmer temperatures mean more spruce beetles, increasing wildfire risk

Coastal erosion threatens the only road out of town

two degrees colder than in Washington, D.C., 1,200 miles closer to the Equator.

As warmer winters arrive in Alaska, this city of 5,000 offers a glimpse of the challenges to come. Precipitation that used to fall as snow lands as rain, eroding the coastal bluffs and threatening the only road out of town. Less snow means less drinking water in Homer's reservoir; it also means shallower, warmer streams, threatening the salmon that support Cook Inlet's billion-dollar fishing industry.

Heavier storm surges are eating away at Homer's sea wall, which no insurance company will cover and which the city says it couldn't pay to replace. Warmer water has also increased toxic phytoplankton blooms that leach into oysters and clams. When eaten by humans, the toxins can cause amnesia, extreme diarrhea, paralysis, and death.

Homer is lucky compared with some villages on Alaska's western coast that are falling into the ocean. Those villages have asked for hundreds of millions of dollars to be relocated inland. "I'm up against other places that are losing their infrastructure or have severe problems due to flooding," says Rick Abboud, Homer's city planner. Last year, Abboud asked the state for \$300,000 to pay for a plan

to cope with a growing stormwater problem. He didn't get it.

Across Alaska, in towns built on permafrost, rising temperatures are causing the ground to sink, damaging buildings and roads. In towns built on the coast, less sea ice means greater exposure to storms and floods. Drier conditions have led to more forest fires. Extreme weather killed or injured as many Alaskans in 2015 as in the previous 10 years combined. "Environmental change is not a theoretical in Alaska," says Rick Thoman, the state's climate sciences and services manager for the National Weather Service. "It's happening, and it's accelerating."

Alaska was once at the vanguard of states trying to deal with global warming. In 2007, then-Governor Sarah Palin established a climate change sub-cabinet to study the effects of warmer



Abboud

weather and find policies to cope with them. Over three years, the legislature provided about \$26 million in funding. But Palin's successor, Republican Sean Parnell, disbanded the group in 2011. That year, Alaska withdrew from a federal program that provides funds for coastal management because of concern the program might restrict offshore oil extraction. Since then, lower oil prices, combined with dwindling production, have left the state with a budget crisis that's among the worst in the U.S. Just when climate change is having real impact, Alaska has less and less capacity to deal with it.

The state program that funds infrastructure and erosion management has had its budget cut 60 percent over three years. The Alaska Department of Environmental Conservation has lost one-third of its funding since 2014. The person listed on Governor Bill Walker's website as his cabinet member responsible for Arctic policy, a term that gets used interchangeably with climate policy, left for Washington last summer to take a second job running the state's federal relations office.

"We've been doing a lot of thinking, a lot of planning," says Lieutenant Governor Byron Mallott, who now leads climate policy. "We've had a lot of meetings." Asked what is the most significant climate achievement since he took office two years ago, Mallott cites engaging "fully" with the federal government. Alaska remains the only state eligible for federal funding through the coastal protection program that doesn't receive the money, because it hasn't submitted a plan that addresses the issue.

Alaska is an extreme example of a national failure to prepare for climate change. Across the U.S., state funding for environmental projects, such as beach erosion control or upgraded sewage systems, peaked in 2007, even as capital expenditures have since risen 25 percent. States along the Atlantic and Gulf coasts have resisted adopting the latest model building codes designed to protect residents against storms and other extreme weather. And when the Federal Emergency Management Agency suggested last year that states take more responsibility preparing for natural disasters, the National Governors Association balked.

In the absence of state action, ►

◀ the federal government has taken over responsibility for dealing with climate change. That spending may be in doubt: President Donald Trump's first budget request cuts many of those programs.

If Alaska is a warning about America's climate future, as Barack Obama argued in a 2015 visit, it portends not only the onset of erratic weather but also the struggle of governments to keep up. "We may seem small and remote to you," says Beth Kerttula, a former Alaska state representative and director of the National Ocean Council under Obama. "But if you don't care about us, you better at least learn from us. Because you're next." —*Christopher Flavelle*

**The bottom line** State cuts have left Alaska increasingly unprepared for climate change, just as the effects of those changes get worse.

take. The White House did not respond to requests for comment.

Three bills, each of which would make life tougher for plaintiffs' lawyers, were scheduled for votes by the full House on March 9 and 10. Several more are in the legislative pipeline. While House passage is a virtual certainty, the Senate presents a bigger challenge.

"These bills are driven by the U.S. Chamber of Commerce and the largest corporations, who want to escape responsibility for hurting people or other businesses." —*Pamela Gilbert*

With a 52-48 majority, Republicans would need to find eight Democratic

votes to reach 60 and avoid a potential filibuster. Lisa Rickard, president of the Institute for Legal Reform, the U.S. Chamber of Commerce's legal arm, says the chamber and other business advocates are focusing attention on 10 Democrats in red states who are up for reelection in 2018, including Bob Casey Jr. of Pennsylvania, Heidi Heitkamp of North Dakota, and Joe Manchin of West Virginia.

Plaintiffs' advocates predict the legislation will stall in the Senate with little or no Democratic support. "These bills are driven by the U.S. Chamber of Commerce and the largest corporations, who want to escape responsibility for hurting people or other businesses," says Pamela Gilbert, a consumer attorney in Washington.

The broadest bill, sponsored by Virginia Republican Bob Goodlatte, chairman of the House Judiciary Committee, would make it harder in several ways to bring class actions. The measure would bar plaintiffs' firms from repeatedly representing the same client in class actions. The most obvious targets are prominent law firms that represent plaintiffs in securities suits. Such firms routinely represent institutional investors in multiple cases over time. Professor John Coffee Jr. of Columbia Law School wrote on his Blue Sky Blog that the restriction "seems either a death sentence for the large plaintiffs' firm or the end of large public pension funds serving as lead plaintiff."

Statistics on class actions are sparse, partly because there's no central clearinghouse for state cases. But numbers are gathered for federal securities cases. Plaintiffs filed a record 270 federal class-action securities cases in 2016—44 percent more than the historical average of

188 filings from 1997 to 2015, according to Cornerstone Research.

Another part of Goodlatte's bill would allow class actions to move forward only when a judge certifies that all plaintiffs have suffered the same type and scope of injury. Imposing such obligations at the outset of a case would encourage more preliminary skirmishing and deter some class actions from ever getting off the ground.

Yet another section of Goodlatte's bill would restrict plaintiffs' attorneys' fees to a percentage of the amount actually distributed to the class. That could effectively kill off suits that seek a change in corporate behavior and pay class members little or nothing in damages. "The idea is to eliminate class actions that don't make any sense from the start," says John Beisner, a partner with Skadden, Arps, Slate, Meagher & Flom, a large corporate law firm. Of course, lawsuits that don't "make sense" to a defendant are often the height of reasonableness to the other side. —*Paul M. Barrett*

**The bottom line** A series of tort-reform bills seeks to curtail the litigation industry by limiting class-action suits and making it harder to sue businesses.

Tort Reform

Will the GOP Finally Crush Class Actions?

- ▶ Pro-business groups push a slew of initiatives
- ▶ One bill may be "a death sentence for the large plaintiffs' firm"

Republicans and their business allies perennially push tort-reform bills aimed at restricting what's sometimes called the litigation industry. They haven't had much luck of late. It's been 12 years since one of those measures succeeded. But with Donald Trump in the White House, pro-business groups see an opening for a series of bills moving through the House that would discourage class actions and generally make it harder to sue businesses.

It's an issue the president has some experience with. Only days after his election, Trump agreed to pay \$25 million to settle claims that his defunct Trump University cheated more than 6,000 students with false promises of teaching them his real estate secrets. On the other hand, Trump has frequently initiated suits against business adversaries, so it's tricky to predict what position he'll

Elections

An Establishment Firebrand in Germany



- ▶ Merkel's Social Democratic rival channels his inner Merkel
- ▶ "You won't get any EU bashing with me"

In the western German city of Schwerte, 700 people jump to their feet, waving red-and-white signs saying "Time for Martin." That would be Martin Schulz, a Social Democrat aiming to deny German Chancellor Angela Merkel a fourth term in



## Photostat

The 3-pound Phantom 3 drone can be used for aerial photography

Drone pilot licenses issued since Aug. 29:

**35k**

Commercial/research drones registered:

**57k**

Hobbyists who've registered as owners of at least one drone:

**698k**

**2.5m**

FAA estimate of drones sold in the U.S. in 2016

**Blacksburg, Va.** Before regulators approve drones for commercial uses such as delivering packages, they need to make sure they're reasonably safe. At a test site at Virginia Tech, researchers slam drones into crash test dummies to measure the potential for injury. The data will help resolve a debate over whether the smallest consumer drones could be flown safely over people's heads. —*Alan Levin*

September elections. Despite the surge of energy as Schulz takes the stage, his message is about as radical as the rally's menu of beer and brown bread slathered in *Mett*—a traditional German concoction of raw pork and onions. After a 45-minute speech in which Schulz promotes his anti-establishment bona fides, he finishes by pledging adherence to a program that predates Germany's 19th century unification. "As Social Democrats, we've had the same goals for 153 years," he tells the crowd.

In the past five weeks, the Social Democrats have vaulted from a distant second place to virtual parity with Merkel's Christian Democrats. Yet even as Germans embrace Schulz as a fresh face, support for the 61-year-old represents nothing like the fervent desire for change that spurred Britain's exit from the European Union and propelled Donald Trump into the White House.

"Schulz's challenge is not really a fundamental one," says Daniel Hamilton, a professor at the Johns Hopkins School of Advanced International Studies in Washington. "It's just a different part of the establishment."

Schulz is a seasoned political operator who served 22 years in the European Parliament, including the last five as its speaker. His party has shared power with Merkel's Christian Democrat-led bloc for seven of the past dozen years with little discord. And on at least one key issue—refugees—he's largely in line with Merkel. "People always ask me what I think of the German government's refugee policy," he tells the crowd in Schwerte. "It's clear that Germany did what it needed to do."

Superficially, Schulz and Merkel have little in common. Schulz never made it past 11th grade and kicked booze in his

20s—"I drank everything I could get my hands on," he's said—before opening a bookstore. He makes no effort to hide his alcoholism, portraying it as an honest reckoning of how far he's come. Merkel, by contrast, can seem formal and plodding. She holds a Ph.D. in physics, chooses words carefully, and keeps her emotions in check. Schulz's only political job in Germany was as mayor of Würselen, a town of 39,000 on the Dutch border. Merkel, 62, has held national office since taking a cabinet post in 1991. From a policy perspective, though, there's far less difference between the two. While Schulz has criticized Merkel's calls for austerity, they're both broadly pro-European and support the blend of capitalism and a social safety net that's underpinned Germany's economic success.

In Brussels, Schulz built a reputation as an activist leader who sought

# Health Care

## A Bill With Few Friends

When Paul Ryan released a draft of a bill to replace Obamacare on March 7, it didn't exactly get a warm reception. And not just Democrats assailed it: GOP members of Congress mounted a savage attack. While President Donald Trump said he was "proud" to support it, most conservatives went out of their way to say how much they hated it.

"House Leadership plan is Obamacare Lite. It will not pass. Conservatives are not going to take it."

Kentucky Republican Senator **Rand Paul** in an early morning tweet; Paul later said the bill was "dead on arrival" during an interview with Bloomberg TV

"It's a stinking pile of garbage."

Kentucky Representative **Thomas Massie** in comments to the *Washington Examiner*

"This is a Republican welfare entitlement."

Statement issued by the **Republican Study Committee**, a group of 172 conservative Republicans in the House of Representatives

"This is not the Obamacare repeal bill we've been waiting for."

Utah Republican Senator **Mike Lee** in a statement condemning the House health-care bill

"This bill is a train wreck waiting to happen."

**Michael Cannon**, director of health policy studies at the Cato Institute and a strong critic of Obamacare

They're "taking the Obamacare framework and trying to call it a Republican piece of legislation."

Michigan Representative **Justin Amash** in an interview on CNN

◀ a bigger role for the European Parliament against national governments, and as a tactician with a keen grasp of policy who doesn't shy away from conflict. "He's able to put emotion back into politics," says Friedhelm Steinbusch, a lawyer in the western city of Aachen, who attended a Catholic boys' school with Schulz in the 1960s and considers him a friend, even though Steinbusch supports the Christian Democrats.

Schulz's pugnacity in 2003 prompted an outburst from Silvio Berlusconi. After Schulz accused Italy's then-prime minister of conflicts of interest and assailed his coalition ally's anti-immigration policies, Berlusconi likened the German to a *kapo*, or Nazi concentration camp guard. Yet even opponents praise Schulz's dedication to European integration. When the euro area was threatened with a breakup in 2015, Schulz flew to Athens to mediate between European creditors and Greece's prime minister, Alexis Tsipras, who'd been making bellicose demands for debt relief. While Schulz has a deep partisan streak, he's "a committed European," says Georgios Kyrtos, a Christian Democrat from Greece in the European Parliament.

On the stump, Schulz's straight talk appeals to Germans who feel left behind despite a booming economy. Polls suggest he's taking support from the anti-immigration Alternative for Germany party as well as Merkel's bloc while rejuvenating the Social Democratic base: The party says it added 10,000 members in February.

Although campaigning won't start in earnest until this summer, Schulz is drawing enthusiastic crowds, speaking out on Social Democratic themes such as workers' rights, investment in education, and the need for increased social spending. "You won't get any EU bashing with me," he says in Schwerte. "Especially when viewed in context of what's happened in the U.S., people must understand that a strong Europe is the best protection for Germany." —*Birgit Jennen, Rainer Buergin, and Tony Czuczka*

**The bottom line** Schulz is being greeted as a fresh face in his bid to unseat Merkel as Germany's chancellor, but the two share many policy goals.



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March 13 — March 19, 2017



## Toto, I've a Feeling We're Still In Kansas (or Missouri)

► Google brought its high-speed internet to Kansas City. That didn't make the area a tech hub

► "We're scratching our heads a little bit"

Soon after **Google Fiber** came to the Kansas City area, so did Brandon Schatz. In late 2012 a house on the Kansas side of the border with Missouri—there's a Kansas City in each state—became the first in the area wired for the company's superfast internet service. Less than two months after he heard of it, Schatz moved 165 miles to Kansas from Springfield, Mo.

The gigabit fiber promised Schatz an easier time uploading photos of amateur sporting events to his nascent website. Officials and business boosters were hoping an

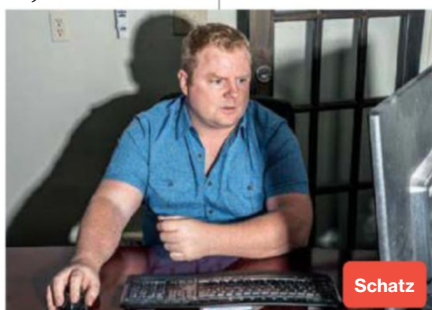
abundance of startup types like Schatz, drawn by the fiber network, would help turn the region into a tech hub, attracting deep-pocketed venture capitalists and talented employees.

Things haven't worked out that way. Schatz's company, **SportsPhotos.com**, is growing, but it's been harder than he expected to build the right business model. While Google Fiber allows

Schatz to upload hundreds of high-resolution photos from sports games in minutes, the site doesn't cover his bills. Most of his money comes from web development

work and from renting his spare rooms on Airbnb. "I thought we would be huge already," he says as he pecks away at the desktop PC in his home office, surrounded by pizza boxes.

Kansas City's startup scene has been slow to gain traction, too. And now that Google has slashed support for its fiber networking, it seems a tale of misplaced expectations. When the company started installing fiber, the two cities' mayors called it "a once-in-a-lifetime opportunity" and a way to "spark economic development." A neighborhood called Startup Village sprang up because of people like Schatz. Few of the companies really took off, though, and some frustrated founders decamped to San Francisco, ►



The rabbit mascot at Google Fiber's Kansas City, Mo., office



◀ with its greater access to capital.

Every year since Google's first fiber connections lit up, greater Kansas City's gross domestic product growth has fallen well short of the national average. In 2015 it was 1.5 percent, vs. 2.6 percent for the whole country. (State numbers suggest Kansas and Missouri topped the national average in the first three quarters of 2016, but full-year numbers aren't yet available.)

"We're scratching our heads a little bit," says Jeff Pinkerton of the Mid America Regional Council, a nonprofit that conducts economic research for greater Kansas City. "Why is Kansas City really not taking off, especially with this asset like Google Fiber?"

After Kansas City beat out more than 1,000 other cities for Google's debut fiber installation, the community did everything it could to leverage fiber. Local business leaders set up gatherings for entrepreneurs. Legislators saved startup tax credits from the budget ax. Hometown telecom company **Sprint Corp.** teamed with startup accelerator Techstars to create an incubator.

A promotional online video about the regional experiment drew Schatz

to what was becoming Startup Village. He did the math: Batches of photos that took 40 hours to upload from Springfield would take less than one hour in Kansas City. "It's a little nerdy, to see this video and be all kinds of inspired," says Schatz, 34, a boyish-looking former U.S. Army sergeant. "But I was inspired."

In practice, however, a dazzling internet connection didn't always mean much. Mike Farmer ran his search engine startup, Leap.it, out of a Startup Village house. "What do you do with gigabit speed that makes the experience more relevant?" he recalls asking his team. They goofed around with ideas, like streaming HD Netflix movies within search results, but never found the right use for their bandwidth. Farmer wound down Leap last year.

Funding has also been a problem in Kansas City. Entrepreneurs there say companies that would have attracted tens of millions of dollars were they based in Silicon Valley could only draw a few million from local investors. "There is a finer filter," says Sandy Kemper, chief executive officer of **C2FO**, a working-capital finance company in the suburb of Fairway, Kan., that he founded in 2008. Midwestern investors wanted to write checks for \$50,000, Kemper says, so he turned to bigger spenders in San Francisco and Singapore for most of his backing. Promising Kansas City startups **Neighborly**, a bond marketplace, and **Acre**, a green homebuilder, moved to the Bay Area when they couldn't get more funding.

Kemper says C2FO may one day go public. An IPO that raises hundreds of millions of dollars, with a valuation greater than a billion, could loosen the purse strings of local investors and yield wealthy employees interested in starting their own companies or investing in others. That kind of critical mass remains the most important component, says Lance LeMay, a venture capitalist at **Open Air Equity Partners** in Kansas City, Mo., who invested in C2FO and Leap. "More than a billion-dollar

**Superfast internet, sure. Silicon Valley levels of investment? Not so much**

exit, you need lots of successful exits," he says. "You don't need a home run. You need lots of doubles."

Back in 2012, **Google** was talking up Fiber almost as much as the Kansas City crowd. At a conference, Executive Chairman Eric Schmidt said that of all the company projects, including self-driving cars, it was Google's "most compelling on many levels," something that "changes your life." Over the next four years it expanded into eight other markets, including Atlanta, Austin, Nashville, and San Diego.

Since the early days, though, the company's ambitions for the network have fallen. Google Fiber CEO Craig Barratt left in October, the same day the division announced it was delaying expansion plans in eight more cities and cutting 9 percent of staff. In February, Google parent **Alphabet** further slimmed Fiber, shifting hundreds of its employees to Google's core search business.

Former employees say Google co-founders Larry Page and Sergey Brin no longer felt the transformative power of the service was enough to justify the cost of laying the fiber. Cable incumbents also moved quickly to introduce similar high-speed services at low prices or block Google through other means. In Louisville, **AT&T Inc.** and **Charter Communications Inc.** sued the city over a wonky regulation that made it easier for Google Fiber to move in.

"Google invested in Fiber during a time when it was willing to make lots of big investments with uncertain or long-term returns, but over the last couple of years Google has become a different place," says Jan Dawson, chief analyst at Jackdaw Research. "It doesn't necessarily make sense for Alphabet to continue to invest in it as heavily at this point."

In Kansas City, Schatz also recently changed his business model. Instead of amateur athletes paying for images from SportsPhotos.com, they download them for free, and he gets his revenue from sponsorship fees. He's working to build relationships with big retailers and fitness companies that could subsidize the blanket photography of the events he and his team of freelancers shoot around the country.

The business of photographing amateur races is worth \$20 million to \$50 million a year in sponsorship fees,



he says. Add in other amateur sports and marketing initiatives, and it could be much more. For now, though, his revenue is modest: It doubled last year but was still less than \$100,000, he says. This year, he hopes to amp up growth and turn a profit.

Schatz acknowledges that developing ties to potential sponsors would be much easier in New York or Los Angeles, but he says he can do it in the heartland. Still, when he begins his search for venture capital later this month, he plans to hit up Silicon Valley. —Sarah McBride, with Mark Bergen

**The bottom line** Google Fiber hasn't attracted the critical mass of startup talent and money that the Kansas City area hoped it would.

Video Games

## Nintendo's New Guard Tries to Switch It Up



► **The company needs a hit from its hybrid mobile console**

► **"It's the first time the software guys got to be in charge"**

Nintendo Co. Ltd. is making its biggest bet in years with the Switch, a console aimed at unifying mobile and home gaming. At first blush, it's paying off: Retailers exhausted supplies of the \$300 system in hours—or even minutes—when it went on sale on March 3, suggesting Nintendo is on track to reach its goal of shipping 2 million of them before April.

The Switch is essentially a tablet with two detachable "Joy-Con" wireless controllers; players can take it to the park or plug it into the living room TV. The idea is that the hybrid technology will make the system more flexible than Sony Corp.'s PlayStation or Microsoft Corp.'s Xbox and help Nintendo better compete with the plethora of mobile ►

## Quoted The Mother of All Early Days

Tim Cook, chief executive officer of Apple Inc., and Sundar Pichai, CEO of Alphabet Inc.'s Google, each oversee one of the world's biggest companies. And each leans on a familiar phrase to talk about its work. —Shira Ovide



The iPhone has "**the mother of all halos**," meaning it leads users to buy other Apple products.

Early 2011, when Cook was chief operating officer, in a meeting with a stock analyst

The iPad "has **the mother of all backlogs**."

April 2011 conference call with stock analysts

Apple had "**the mother of all Januarys**" in selling iPhones.

April 2012 analyst call

The iPad gives Apple "**the mother of all opportunities**" in the computing market.

January 2013 analyst call

The iPad is "going to be the **mother of all markets**."

February 2013 Goldman Sachs conference

"We had **the mother of all years**" in 2012.

February 2013 meeting with Apple investors

New software for Apple developers is "**the mother of all releases** for developers."

June 2014 at Apple's annual software developer conference (WWDC)

The iPhone 6 debut will spark "**the mother of all upgrades**" from older smartphones.

September 2014 Wall Street Journal interview

The Apple headquarters under construction is "**the mother of all products**."

March 2015, interview in Fortune

"We have **the mother of all balance sheets**" with almost \$216 billion in cash.

January 2016 analyst call

iOS 10 is "**the mother of all releases**."

June 2016 at WWDC

Chrome "is in its **early days**, but we think we can do to the mobile web what we did for the desktop web."

May 2013 at Google's annual software developer conference

"Organizing the world's information turns out to be something that has a lot of room ahead. We are still in **early days**."

October 2015 analyst call, discussing earnings and goals for his tenure as CEO

"I still think it's **early days**, and there's a long-term investment" in Google's AI technology, DeepMind.

February 2016 analyst call

"It's **early days** and it's a long-term investment" in cloud services aimed at big companies.

April 2016 analyst call

AI "is still **early days** for all of us."

June 2016, at the Code Conference

"We are in very, very **early days**, but we're being thoughtful" about user control of targeted ads.

July 2016 analyst call

"We are in very **early days**" for web searches by voice.

October 2016 analyst call

"It's very **early days**" for voice search.

January 2017 analyst call

"I think video advertising is in its very **early days**."

Same call

"We are in the **early days**" of Google's Pixel smartphones.

Same call

"It is **early days** now, but I think we already have really new insights" on adding revenue using machine learning, "and so we'll bake it in over the course of the year."

Same call





◀ games that lured away many of its more casual gamers over the past decade. It's hoping the Switch will be a hit on the level of 2006's Wii, enough to help the company rebound from the failure of its 2012 Wii U console while it experiments with making games for smartphones.

This time around, Nintendo handed console construction to a small team of artistic veterans: Shinya Takahashi, who helped build some of the company's earliest 3D games; Yoshiaki Koizumi, a designer involved in '90s classics like *Super Mario 64*; and Kouichi Kawamoto, who developed more eccentric projects, including the ghostbusting game *Luigi's Mansion*. "It's the first time the software guys got to be in charge of the hardware," Koizumi says.

The trio assembled a team of about two dozen, mostly game designers in their 20s and 30s, to sketch out ideas and test prototypes. "We opened development in a way that was unthinkable," says Takahashi. "Decisions previously made by senior people were entrusted to a young group closer to the front line." They made sure the Switch could function anywhere and that it would be easier for game developers to work with than the often-troublesome Wii U.

The finished product transitions smoothly between its TV and portable modes, and reviewers have gushed over one of the games released the same day, fantasy epic *The Legend of Zelda: Breath of the Wild*. "It's too early to say if *Breath of the Wild* is one of the best games ever made, but I do think it probably surpassed its hype by a fair margin," says Jeff Gerstmann, who runs game review site *Giant Bomb*.

About 314,000 Switches sold in Japan during the console's first weekend, according to industry magazine *Famitsu*—slightly eclipsing the Wii U's sales for its first week and comparable

to the opening for the PlayStation 4, despite the Switch's March doldrums release.

Nintendo told the *New York Times* that sales in the U.S. over its first two days broke a company record.

Still, merging home and portable gaming meant compromises, including weaker graphics than other consoles and weaker battery life than your smartphone. And the Switch's emphasis on playing with others face to face fights the tide of online gameplay.

To sell to an audience beyond the faithful, Nintendo will need a steadier lineup of great games than it's had in recent years, says Gerstmann. "I think the Switch might be trying to be too many different things to too many different people," he says. "I don't think they currently have a *Wii Sports*-size hit on shelves, and nothing they've announced thus far seems poised to take on that role, either." —*Yuji Nakamura and Stephen Stapczynski*

**The bottom line** A fast start for its Switch hybrid console brightens Nintendo's hopes of shipping 2 million of them by the end of March.

## 3D Printing

### Rare Jewelry That Isn't So Rare Anymore

▶ **Printable bling is edging its way into the mainstream**

▶ **"The manufacturing costs ... are cut probably by 75 percent"**

In college, when Mario Christian Lavorato and his brother started making jewelry to sell, they quickly learned that the business had kept one foot in the Middle Ages. They designed their beads and charms out of clay,

then molded the finished products by hand. Peers they met at trade shows used blowtorches to meticulously craft each piece for weeks.

That heavy labor is a big factor in the slim profit margins of the typical U.S. jewelry store, which hover around 4.6 percent, according to researcher IBISWorld. The Tiffanys of the world have U.S. margins of about 20 percent. But Lavorato, 32, studied architecture in college, and he knew how to use 3D printers. **Daniel Christian Tang**, his three-year-old Toronto business, claims a 40 percent profit margin, though Lavorato wouldn't disclose revenue.

3D-printed jewelry has been a pricey curiosity for the past few years. Now producing it is getting cheap, fast, and precise enough to make it a little more mainstream. Instead of using 3D printers just to make wax models of designs to be cast in gold or platinum, Lavorato's company is one of a growing stable of startups using printers to make the end products.

Lavorato says Daniel Christian Tang can take as long as 100 hours to design a necklace, bracelet, or earrings with 3D-imaging software. But once that's done, it takes less than an hour to print a copy, or a few hours to modify the design for a customer with slightly different taste. "Then it just becomes a matter of how many printers you can fit in the room," says Lavorato, who went to Hong Kong in February to set up a factory. The company's pieces range from a \$16,000 gold bangle to a \$100 platinum and sterling ring, and most of the cheaper items are available through **Lord & Taylor** and **Saks Fifth Avenue**.

Affordability is a big part of the sales pitch, but the layered construction of the printing process is also attractive, says Chantal Marois, an engineer in Portland, Ore. At local **SaySay Boutique**, she paid about \$40 for a black plastic necklace that looks like

#### Sparkling Margins

3D-printed jewelry cuts costs

**Bre & Co.**  
Origami watch

**\$5,800**

**Daniel Christian Tang**

14-karat rose-gold bangle

**\$1,000**



**Love & Robots**  
Windswept cloth pendant

**\$281**



**Daniel Christian Tang**

14K white-gold Calatrava cuff

**\$11,000**





# Innovation

## Handheld 3D Mapper

an abstraction of flowers—an intricate, 3D weave of strings. “It had an unusual shape, an unusual design. It caught my eye,” she says. “It would have been very difficult to produce the necklace with another method.” SaySay proprietor Sarah Utrup says she’s sold out most of her 3D-printed stock.

The ease of customization has also boosted novelty. In Dublin, jeweler **Love & Robots** lets buyers enter a date and location, then uses historical wind speed data to personalize windblown designs of its earrings. On **American Pearl.com Inc.**’s website, once buyers choose the pearl color and size, they can customize the necklace length and the metal used in a design. “Today we do a tremendous amount of custom work using 3D printing,” says Eddie Bakhsh, who heads American Pearl’s online arm. “The lion’s share of what we do is custom or adapted. The manufacturing costs of our pieces are cut probably by 75 percent.”

Some jewelers use their own equipment. **Bre & Co.**, for example, was started in October by Bre Pettis, the former chief executive officer of printing company MakerBot Industries LLC. Others rely on print-as-you-go services such as **Shapeways** so they don’t have to buy materials or handle inventory.

The printing processes aren’t perfect. They tend to leave behind trace amounts of gold powder, and the waste can add up. There’s a learning curve, too. “Most jewelers don’t have those skills, and it takes a lot of effort to learn CAD [computer-aided design] software that produce these designs,” says Terry Wohlers, president of researcher Wohlers Associates. “That’s the biggest obstacle. Over time, as young people take over their parents’ business, that may drive the market faster.”

Fatter profit margins may also lead more jewelers to 3D printing, especially as the technology continues to improve. “Now it takes 30 to 45 minutes to print a bracelet,” Lavorato says. “Within a year or two, it’ll come down to several minutes. Eventually you’ll be able to print instantly.” Then the margins will jump, too. —*Olga Kharif*

**The bottom line** 3D-printed jewelry, once the stuff of novelty, is getting cheap and speedy enough to cut sellers’ costs and boost profits.

### Form and function

The Contour, a touchscreen device that’s a little thicker than a tablet, uses a built-in laser range finder to generate computer models of building sites or interiors undergoing renovation as it’s carried through them.

### Innovator Kevin Dowling

Age 56

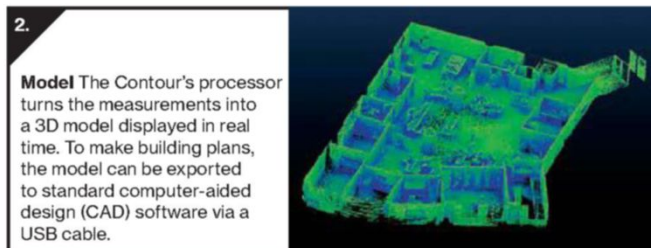
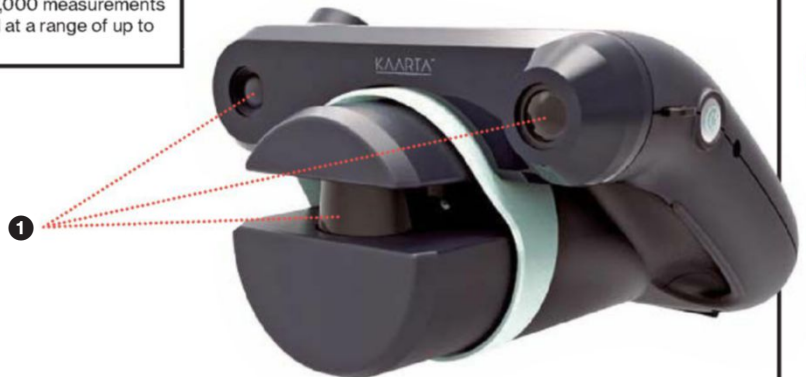
Chief executive officer of Kaarta Inc., a two-year-old, four-employee startup in Pittsburgh



**1. Measure** As an architect or contractor walks through the space, the Contour gathers about 43,000 measurements a second at a range of up to 49 feet.

**Origin** Dowling, a roboticist trained at Carnegie Mellon University, joined Kaarta to commercialize the proprietary algorithms created by CMU grad student Ji Zhang.

**Funding** Dowling says the company is already turning a profit on licensing and sales of its proprietary software and outdoor-mapping hardware.



**2. Model** The Contour’s processor turns the measurements into a 3D model displayed in real time. To make building plans, the model can be exported to standard computer-aided design (CAD) software via a USB cable.

### Preorders

Customers who’ve signed up to receive the first production units include architecture, engineering, and construction companies as well as researchers at automakers working on self-driving cars.

### Next Steps

“There’s a gap in the marketplace for something that captures 3D, does it quickly, and does it indoors,” says Aaron Morris, a senior manager at CAD developer Autodesk Inc., who predicts that the Contour will score with builders and renovators. Dowling says production will start in the second half of this year. Kaarta’s next product, Traak, aims to enable robots and self-driving vehicles to navigate without GPS. —*Michael Belfiore*



# You Can't Retire On the Trump Bump

► U.S. stocks keep on booming but may not deliver the long-term returns many hope for

► “It’s a mysterious time to be predicting market psychology—it’s not like most times in history”

The S&P 500 has returned more than 11 percent since the election of President Trump on Nov. 8, adding a bit of renewed thrill to a bull market that’s already eight years old. Clearly, investors are feeling optimistic about the prospect for returns. But many companies that put individual investors’ money to work for the long run have been arguing for lower long-term expectations.

That’s not a judgment on Trump or his economic policies—it’s about equity valuations and fundamentals that were in place before the election. Last year, Horizon Actuarial Services LLC surveyed 35 investment advising companies about their working assumptions for returns. On average, they anticipated annual returns from U.S. large-company stocks of about 7 percent for the next decade. Not bad, but it may feel like a comedown: Since the market turned around in 2009, it’s churned out an

annualized 17 percent return, according to S&P Dow Jones Indices. Since 1925, accounting for many cycles of bull and bear markets, stocks have returned about 10 percent annualized.

The so-so projections from the experts would come as news to many people saving for retirement. The giant asset manager BlackRock Inc. recently polled 1,000 participants in workplace savings plans and found that 65 percent weren’t familiar with forecasts saying stock and bond returns could be significantly lower than they’ve been in recent decades. Most said they expect future returns to mirror those of the past.

Among long-run forecasters, Rob Arnott, founder of investment adviser Research Affiliates LLC, is on the bearish side, but his process is similar to one many use. He calls it “simple arithmetic.” He assumes stock returns over long periods will consist of the dividend yield they pay,

plus the growth rate of earnings and dividends, including inflation. Today S&P 500 stocks yield an average of about 1.9 percent, and the growth rate over the past century has been about 4.3 percent. That’s a mere 6.2 percent expected return. Stock returns were often higher in the past because dividend yields were higher, too. “Most people pay no attention to arithmetic, because it gives them answers they don’t want to hear,” Arnott says.

That math assumes there’s no change in investors’ basic appetite for the risk of holding stocks. If they become more confident, that could push up valuations and add another bump to returns. Is that part of what’s been happening since the election? Robert Shiller, the Yale economist and Nobel Prize winner famous for his work on the effects of market psychology, says it’s hard to tell.

“It’s a mysterious time to be predicting market psychology—it’s not like



most times in history,” he says, in part because interest rates and bond yields are still unusually low, which tends to make stocks look more attractive to investors. Trump has part of the population feeling more optimistic, Shiller says, but “the market started going gangbusters under Obama and has just continued upward under Trump.”

One effect of that long rally is that stocks look relatively expensive. The average price-earnings ratio for stocks in the S&P 500 is 18.3, based on consensus estimates of 2017 earnings. That’s near the high end of the historical track record, says Fran Kinniry, a principal in the investment strategy group at Vanguard Group, which manages more than \$4 trillion in assets. And when he looks at other valuation measures—such as those based on companies’ revenue or free cash flow—they’re all in the top 25 percent of historical readings.

Similarly, Shiller points to a measure he helped popularize, called the cyclically adjusted p-e ratio, or CAPE, which compares prices with the average of earnings over the past 10 years to smooth out the ups and downs of the business cycle. When the CAPE is high, Shiller has found annual returns will tend to be lower over a long period. A low CAPE augurs above-average returns.

The average CAPE ratio for U.S. stocks over the past 100 years was about 17. It stands at 29.6 now—the only times it was higher were in 1929 and around the dot-com bubble, Shiller says. Those are worrisome precedents, but he’s quick to point out that during the dot-com episode the valuation multiple climbed to above 44 in 1999.

Valuation explains about 40 percent of returns, says Vanguard’s Kinniry; the other 60 percent is unexplained—the market is just plain noisy that way. So instead of predicting a single number for future returns, Vanguard prefers to think of a probable range of outcomes. Kinniry says there’s a 25 percent or so chance that over the decade stocks will deliver the double-digit returns many investors expect. There’s the same chance of an average return of 3 percent

or less. In that scenario, it will be hard for many to fund a comfortable retirement without extraordinarily diligent saving.

Bonds don’t offer an especially appealing alternative, given that 10-year U.S. Treasuries are paying

just 2.5 percent.

“That’s why it’s not so clear you want to exit the market,” Shiller says. “It’s not clear at all.” Even so, Kinniry and others have been advising individual investors to rebalance their port-

folios to account for the big rise in equities—in other words, shift money from stocks to bonds. The strategist notes that there’s been a lot of money flowing into equities over the past three months. “What you’d want to see is cash flow be countercyclical to maintain asset allocation, to go into bonds,” Kinniry says. “But unfortunately investors buy past returns.” Even with low returns, high-quality bonds offer diversification when equities are in a bear market. Not that he’s predicting one, mind you. —*Suzanne Woolley*

**The bottom line** Stocks aren’t priced to deliver big long-term returns, but they might stay high for a while.

29.6

Ratio of stock prices to the past 10 years of earnings. The average ratio over the past 100 years was 17; the high was 44, in 1999

## Energy

### Why the Oil Glut Isn’t Gone Yet

▶ **Low prices forced shale producers to become more efficient**

▶ **“The rigs are up again, the fracking crews are busier”**

A year ago, Saudi Arabia’s then-energy minister, Ali Naimi, had harsh words for U.S. shale drillers struggling with the worst price crash in a generation. “Lower costs, borrow cash, or liquidate,” he said at the 2016 CERWeek,

the giant energy conference held annually in Houston.

The mood of the U.S. oil industry was far more upbeat in early March as executives, bankers, and investors met again in Texas. Drillers who’ve survived have largely taken the first part of Naimi’s advice. While more than 100 shale producers have gone bankrupt since the start of 2015, the remaining companies have reshaped themselves into fitter, leaner, and faster outfits that can thrive even without sky-high oil prices. Now it’s Saudi Arabia and the other OPEC nations that are seeking solutions. The oil cartel, of which the U.S. isn’t a member, is desperate to drive up prices in a push to repair the economies of the countries it represents.

“The shale business is rejuvenated, because of the difficulties it has been through,” Ben van Beurden, chief executive officer of **Royal Dutch Shell Plc**, said in comments to investors in February. Companies are more focused on efficiency, and thanks to more powerful fracking techniques, new wells are yielding more barrels than ever. The average well in the Permian basin of West Texas and eastern New Mexico is delivering 668 barrels per day, from just 98 barrels four years ago, according to government data.

After a two-year downturn spurred by oil’s plunge to \$26 a barrel from \$100, U.S. production is on the rise once again. The number of drilling rigs has grown 91 percent to 609 in a little more than nine months. Meanwhile, production has grown by more than 550,000 barrels a day since the summer, rising above 9 million barrels a day for the first time since April.

Oil has climbed back above \$50 a barrel, but on March 8 markets suddenly seemed to register the effect of U.S. supplies, knocking prices down 5 percent in one day. That price is still high enough for today’s drillers. “Today, almost every single shale basin is economic in the \$35 to \$50 a barrel price range,” says Regina Mayor, head of energy at KPMG LLP in Houston.

It’s a new reality that OPEC and Russia, the main forces behind the production cuts approved last year, are ▶

◀ starting to acknowledge. “With \$55 a barrel, we see everyone very happy in the U.S.,” said Didier Casimiro, a senior executive at Moscow-based **Rosneft Oil Co.** prior to CERAWeek. That’s making it harder for Russia and OPEC to cut off what they see as a revenue-squeezing supply glut.

Naimi’s successor as Saudi oil minister, Khalid Al-Falih, struck a diplomatic tone in a speech in Houston on March 7. He said he welcomed growth in shale, and spoke of “green shoots” in the U.S. industry. **ConocoPhillips Co.** CEO Ryan Lance later quipped that it’s more like “trees growing” out of the Permian. “Shale oil is going to make the life of some other oil producers very, very challenging,” says Fatih Birol, executive director of the International Energy Agency, which advises rich countries on oil policy.

So far this year, U.S. energy companies have raised \$10.5 billion in fresh equity, with shale and oil-service groups drawing the most investment. That’s the best start of any year since at least 1999 and equal to a third of what the sector raised in all of 2015. “North American oil companies are going to increase their spending by 25 percent in 2017 compared to last year,” says Daniel Yergin, the consultant and oil industry historian who hosts CERAWeek. “The increase reflects the magnetism of U.S. shale.”

In Midland, Texas, the city at the center of the Permian basin, there’s been a rush of activity. “You could see the town’s energy is back,”

says Alan Means, founder of Midland’s **Cambrian Management Ltd.**, which operates more than 200 wells across Texas and New Mexico. “The rigs are up again, the fracking crews are busier, and the highway traffic is increasing.”

The man-camps on the outskirts of town are flush again, with workers arriving from the Bakken in Montana and North Dakota and as far way as Canada. The 1,000-bed Permian Lodging camp is now 100 percent full, up from 65 percent in July, according to camp owner Ralph McIngvale.

Shale companies such as

**EOG Resources Inc.** and **RSP Permian Inc.** are telling investors they’ll expand output by as much as 30 percent in the next two or three years, more than they did in the heyday of the shale boom, between 2010 and 2014. Greg Armstrong, CEO of **Plains All American Pipeline LP** told investors in February: “The bottom line is we think they can produce as much oil out of the Permian as they want to.”

—Javier Blas

**The bottom line** A crash in oil prices put many drillers out of business. Now companies plan to increase their spending in 2017 by 25 percent.

### Stocks

## A China Moonshot for Chicago’s Exchange

▶ **An acquisition by a Chongqing conglomerate faces scrutiny**

▶ **“We think that we’re the preeminent destination”**

After more than a century in the shadow of New York’s Big Board, the Chicago Stock Exchange has been short on cash and searching for relevance. Now the exchange, which handles less than half a percent of U.S. stock trades, is approaching the final hurdle in an audacious plan to become a player in international equity markets.

The exchange last year found a buyer: a group of investors led by **Chongqing Casin Enterprise Group Co.**, a conglomerate based in China with no apparent experience running an exchange. If the \$27 million deal wins approval from the U.S. Securities and Exchange Commission, one of America’s oldest trading venues will have a new focus: courting listings from small companies, particularly those based in China.

The deal “affords us the ability to grow, it enables us to hire, it allows us to run a listing program that allows companies to raise the capital they need to grow,” says John Kerin, the chief executive officer of the exchange. Kerin and his team have spent the past year answering regulators’ questions,

but SEC approval isn’t assured. The acquisition passed muster with the Committee on Foreign Investment in the U.S., which evaluates the security risk of takeovers by foreign companies, but President Trump criticized the acquisition during his campaign. Members of Congress in December questioned whether the business could be adequately supervised.

Casin, which invests in real estate and operates sewage treatment plants, is leading a buyers’ group that includes an interior design firm and several U.S.-based entities. As members of Casin’s leadership have begun learning about owning a stock market, they’ve been discovering Chicago with the help of Kerin and his colleagues. They’ve walked the lakefront, gone bowling, and caught a Bulls game. (They haven’t yet seen the Bears.)

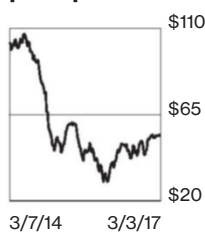
The group’s plan would revamp the exchange’s stock listings business to cater to small and midsize U.S. companies that can’t meet the requirements and costs of listing on other exchanges. The venture would take advantage of a 2012 law, the Jumpstart Our Business Startups Act, that makes it easier for small companies to go public.

The plan would also seek to capitalize on interest from Chinese companies in pursuing a U.S. listing. More than 800 enterprises are waiting for initial public offering approval on exchanges in China, according to the China Securities Regulatory Commission. But building a new pipeline for Chinese listings has risks. Investors were burned by an earlier wave of small-to-mid-size Chinese companies using so-called reverse mergers. The deals involve buying an already-listed company to skirt the rigors and expense of an IPO. About 448 Chinese companies got publicly traded stocks in the U.S. through such deals from 2000 to 2011, according to research from the Singapore Management University.

Many of those companies were ill-prepared to meet stringent reporting rules and used small auditors that failed to catch accounting problems. Some were outright frauds. In June 2011 the SEC warned investors about the risks of reverse mergers in a special bulletin. Delistings, suspensions, and lawsuits followed.

Kerin says the exchange would

**WTI crude oil price per barrel**

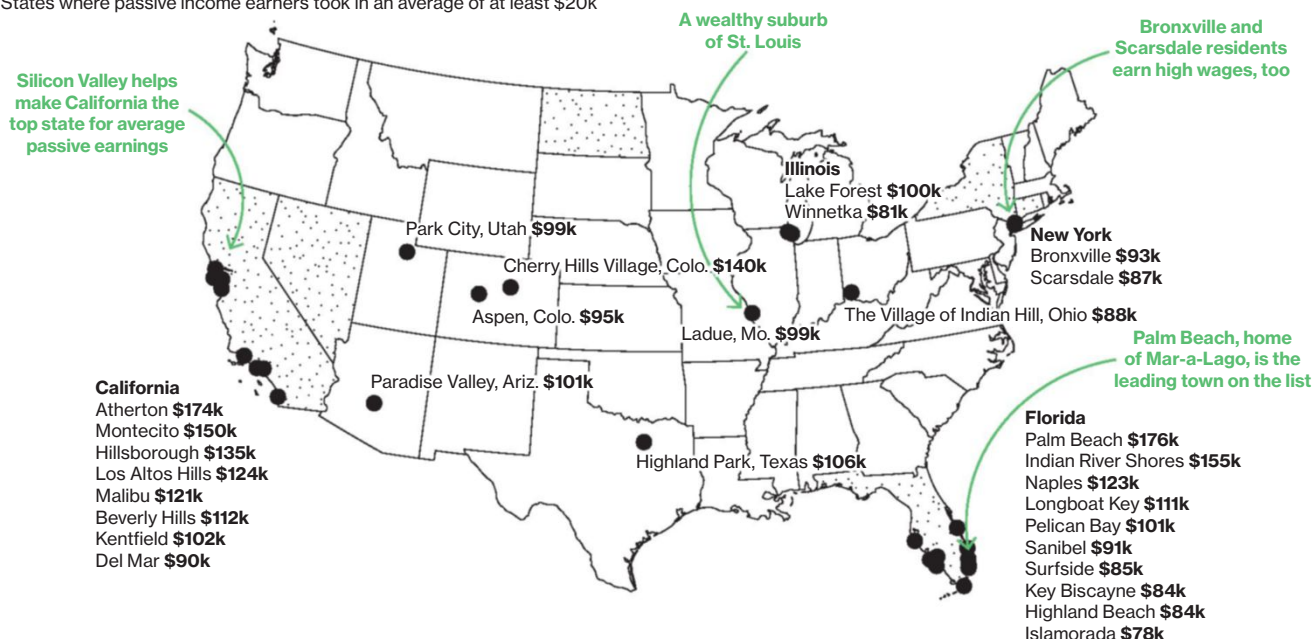




## Wealth Where the Living Is Easy

Passive income comes from interest, dividends, rents, and the like, and tends to be collected by the well-to-do. In the 29 places marked below, the households that receive passive income earn more from it, on average, than the average total household income in their state and the nation. —Wei Lu

☐ States where passive income earners took in an average of at least \$20k



need to be vigilant in policing listed companies to avoid problems similar to those the NYSE and Nasdaq faced over reverse mergers. “We just need to learn from their mistakes,” he says. The exchange, he adds, would rely on Casin to do much of the vetting of Chinese companies. Peter Halesworth, founder of Heng Ren Investments LP, which has invested in U.S.-listed Chinese stocks, urges caution in opening U.S. markets to another big wave of Chinese companies. “The gaps that existed during the reverse merger crisis are pretty much still with us today,” he says.

In the longer term, exchange executives say they have ambitions to open a regional exchange in Chongqing. The group also sees potential in the more than 100 million Chinese citizens with retail brokerage accounts. By attracting their trades to Chicago, the exchange could bump up its volume by as much as 15 million shares per day, says Anthony Saliba, a Chicago Stock Exchange board member whose company, **Saliba Ventures Holdings LLC**, will own 12 percent of

the exchange if the deal happens.

Tapping those investors will be tricky because of China’s controls on capital outflows. Brokers are nonetheless betting that regulators will find ways for citizens to move their money overseas. Saliba says his company has been in touch with firms that are looking “to allow their clients to trade in the U.S.”

Five members of Congress have written the SEC criticizing the deal. The commission extended its public comment period, drawing letters that questioned aspects of the acquisition. One figure from the reverse merger era, Benjamin Wey, has left fingerprints on the review process. In 2015 the U.S. Department of Justice charged Wey with securities fraud for engineering reverse mergers, then secretly accumulating ownership stakes in some of them and manipulating their share prices. Wey pleaded not guilty. The case is set for trial later this year.

Wey’s company, **New York Global Group**, paid **Sconset Strategies LLC** \$150,000 in the third quarter, in part to lobby members of Congress about

“issues related to the purchase of the Chicago Stock Exchange,” according to a report filed with Congress. It’s impossible to tell from the filings whether the lobbying was aimed at supporting or opposing the deal. Wey, NYGG, and Sconset Strategies did not respond to repeated requests for comment. Kerin says the Chicago Stock Exchange has “absolutely nothing to do” with Wey.

A U.S. Casin subsidiary responded to some of the critical comment letters, saying concerns about the group’s ownership have “no basis in fact.” Exchange executives expressed frustration at some of the reaction to the deal. “There are detractors from this, but we think that we’re the preeminent destination,” says Jim Ongena, the exchange’s general counsel. In the U.S., “we’re trying to make Chicago unquestionably the second financial center, and an international financial center.” —*Annie Massa, Dune Lawrence, and Nick Baker*

**The bottom line** The Chicago Stock Exchange wants to become a hub for trading small and midsize companies and Chinese stocks.

“The gaps that existed during the reverse merger crisis are pretty much still with us today.”  
—Peter Halesworth of Heng Ren Investments

March 13 — March 19, 2017



► ProtectWise’s virtual-reality software allows companies to police their networks like cities

► “You can immediately see that there’s really something funky with the traffic going on over there”

Pity security analysts. The complexity of the corporate networks they guard makes it difficult to spot a crime as it’s taking place. More often than not they’re stuck digging through digital logs trying to piece together what happened. It’s often tedious work, though the pay isn’t bad.

Imagine if cybersentinels could take to the skies to spot signs of trouble, like characters in a video game. Over in that neighborhood to the east, which is home to the accounting department, one of the buildings has suddenly changed from its customary yellow to an alarming shade of red. It’s time to investigate.

**ProtectWise Inc.**, a Denver-based

security startup, is preparing to roll out virtual-reality software that maps a computer network as a city. Each business unit or department can be assigned its own block, or neighborhood, and the individual network components become buildings within it. Hexagonal structures stand in for mobile devices, while round towers identify databases. The software also visualizes the data traffic among different parts of the network.

“Without looking at numbers or ports or anything, you can say, ‘Why are all of those connections going to this one host?’” says Jay Leek, managing director of venture fund **ClearSky Security** who joined the ProtectWise

board in January. “You can immediately see that there’s really something funky with the traffic going on over there. You have no idea what it is, but you can go focus on that first, because you know that’s different from what you would expect to see.”

Creating a more exciting, intuitive, and even beautiful user interface has been part of the company’s mission since its inception in 2013. The ProtectWise Grid, the company’s original product, now used by 50 clients including **Netflix Inc.**, has a two-dimensional interface designed by Jake Sargeant, who had a hand in creating the special effects for the film *Tron: Legacy*. A control panel



The software uses shapes and colors to denote functions and levels of risk

displays the network information collected by ProtectWise sensors as a series of point-and-click interactive screens, with threats color-coded by severity and mapped in various ways. The VR version of the user interface, dubbed Immersive Grid, should be ready for testing by customers sometime between July and September.

Many security products are designed to filter the information that an analyst needs to respond to. ProtectWise has turned

that idea on its head. "Instead of hiding 10 million data points and looking at the top 10, why don't I show you all 10 million in a way we can reason with?" says Gene Stevens, co-founder and chief technology officer of ProtectWise, which has raised \$67 million in venture capital so far.

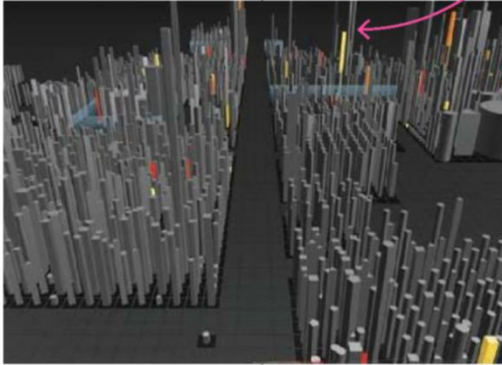
The video game view of a company's network taps into the skills and aesthetics of the Xbox generation. That's crucial to solving a looming shortage of security analysts, says Scott Chasin, co-founder and chief executive officer of ProtectWise. The Center for Cyber Safety and Education estimates the shortfall will grow to 1.8 million by 2022, based on a recent survey of more than 19,000 cybersecurity professionals.

In the same way that you don't need to be a pilot to fly a drone, you won't necessarily need years of technical experience to recognize something is amiss with a company's security. Analysts can patrol a network the way beat cops do, with an eye for what's suddenly out of the ordinary in a familiar streetscape.

The VR concept has already helped clinch business from a top law firm, Stevens says. ProtectWise hasn't determined how much the service will cost. While the software is proprietary, the hardware isn't. Customers will be able to use goggles from

Oculus Rift or other VR gear. (Pricing for ProtectWise Grid is based on the amount of network traffic a company chooses to run through the system as well as the length of time it chooses to retain records.)

Richard Rushing, chief information security officer at Motorola



Mobility LLC, has previewed the VR software and gives it high marks. "On the highway, I can tell there's traffic, but I don't have complete visibility about what's going on," he says. "I think of

this as a traffic helicopter."

Rushing says the phone maker has been using the original Grid product for about a year. It's made job training easier, he says, and helped less experienced security staff get up to speed more quickly. "For lack of a better term, it is almost like the interface was contagious," he says. "People were like, 'Oh, this is cool, I can find out exactly what I want to.'"

—Dune Lawrence

**The bottom line** ProtectWise is gearing up to roll out a VR product that gives cybersentinels a fresh way of dealing with hacks.

## Government

### Trump and Tech Companies Make Nice

▶ The industry has had input on a forthcoming executive order

▶ It's "aligned with things we've been promoting"

Silicon Valley has a complicated relationship with President Donald Trump. Many of its executives and employees helped raise money for his campaign rival, Hillary Clinton, and more than 120 companies, from

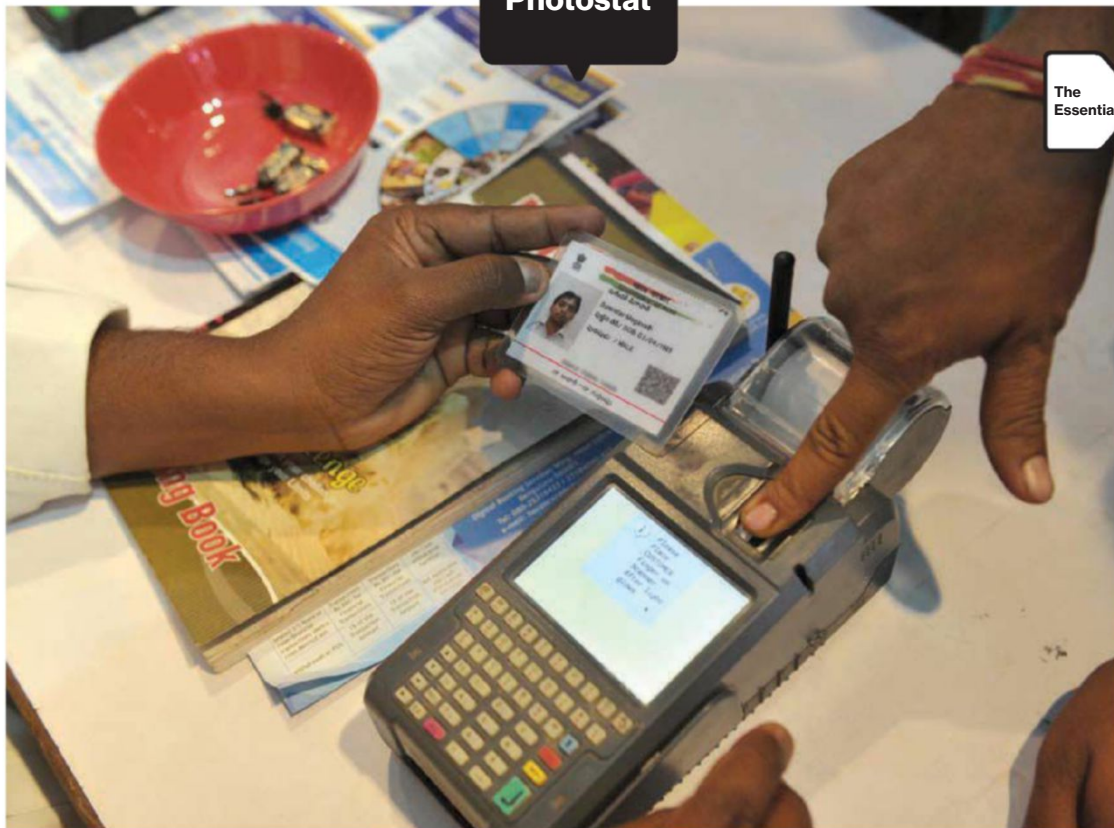
**Apple Inc. to Zynga Inc.**, jointly filed a legal brief condemning the Jan. 27 immigration order. Yet Trump and the industry seem to have found common cause on one topic: cybersecurity.

Executives from several security companies say the administration has sought their input to help smooth the rollout of an executive order on cybersecurity. "People associated with the administration have reached out for feedback to myself and other experts in the industry as they're thinking through the strategy," says Dmitri Alperovitch, co-founder and chief technology officer of **CrowdStrike Inc.**, the company hired by the Democratic National Committee last year to investigate Russia's breach of its computer systems. The order had originally been scheduled for Jan. 31 but was delayed, along with several other White House initiatives, amid the protests and legal challenges incited by the president's travel ban.

The Information Technology Industry Council, a Washington-based trade group that represents tech heavyweights including Facebook Inc., Microsoft Corp., and Adobe Systems Inc., sent Trump's transition team a list of recommendations from its members on how to improve cybersecurity at federal agencies. Among them: directing agencies to conduct inventories of their information technology systems within 90 days and working with Congress to improve the acquisition process for information technology. Based on leaked drafts of the executive order its members have seen, the directive "is heading in the right direction and aligned with things we've been promoting," says Pamela Walker, the council's senior director for federal public-sector technology.

Those drafts promise some continuity with former President Barack Obama's approach, according to Lisa Monaco, who served as Obama's homeland security adviser and is now on the faculty at New York University School of Law. Monaco cited a focus on an open and innovative internet that's "prioritized for commerce" as well as for information-sharing among agencies and the private sector. ▶

Photostat



The Essentials

**Name** Aadhaar

**What** Launched by the government in 2009, it's the largest identity system in the world, with biometric data on almost 90 percent of India's population.

**How** Banks and social agencies use Aadhaar to authenticate transactions, which the government says has helped cut down on fraud.

**\$1.2b**  
Investment so far

**119**  
Number of banks registered to use it

## Biometrics India's Answer to Safe Payments

An eight-year drive to get all of India's 1.2 billion citizens enrolled in a biometric database got a boost from Prime Minister Narendra Modi's crackdown on cash. Since a ban on most bills took effect in November, 50.6 million people have joined the program, enabling them to open bank accounts as well as make and receive digital payments. —Archana Chaudhary

◀ “The draft I saw, the preamble, you basically could lift that entire paragraph out of President Obama’s cyberstrategy,” she said in a Feb. 14 speech in San Francisco.

Yet in the wake of high-profile breaches at the U.S. Office of Personnel Management and the Pentagon during the Obama administration, some Republicans are pressing the Trump administration to define a new approach to the problem. “We will continue to apply the appropriate pressure to ensure that the new administration develops a cyberstrategy that represents a clean break from the past,” Arizona Senator John McCain said at a March 2 hearing organized by the Senate Armed Services Committee.

A Trump aide who asked for anonymity to describe the content of one of the drafts said the president

would hold agency heads personally responsible for securing their computer networks against criminal attacks.

Trump’s advisers on cybersecurity include former New York Mayor Rudy Giuliani, whom Trump has said would lead a committee to work with private-sector experts, and Thomas Bossert, the president’s assistant for homeland security. CrowdStrike’s Alperovitch says Bossert, who worked on the National Security Council during President George W. Bush’s administration, understands the cybersphere “really well” and realizes the government needs the private sector to combat threats, so the



Bossert

outreach to companies is a “very encouraging sign.”

While some personnel from the Obama era have stayed on, key positions in the government’s cybersecurity apparatus remain unfilled. As Trump builds his team, he’ll require some “hard-core” technologists, says Intel Corp.’s Steve Grobman, who helps oversee the creation of technologies to protect connected computing devices and other “smart” infrastructure.

Grobman says the administration has made some strong appointments, including Joshua Steinman, who’s been tapped to lead cybersecurity efforts at the National Security Council. A U.S. Navy Reserve officer, Steinman most recently worked at ThinAir Labs Inc., a Palo Alto-based security startup. Even if there’s tension between Silicon Valley and



the administration in some policy areas, Grobman expects alignment around cybersecurity. “As long as the final order is similar to the draft,” he says, “it’s a great start.”

—Nafeesa Syeed

**The bottom line** Executives at cybersecurity companies say leaked drafts of a presidential order reflect the industry’s thinking.

## Capital A Heightened State Of Security

▶ **The number of venture capital deals reached a record last year**

▶ **“This is the modern-day gold rush that everyone wants”**

Fear sells. Drawn by the tens of billions of dollars that companies and governments are spending to avoid becoming the next hacking victim, cybersecurity startups are setting up shop in record numbers. And venture investors are happily funding them, hoping that one of these tiny companies could be the next **Palo Alto Networks Inc.** or **Symantec Corp.**

Investors plowed \$3.1 billion into a record 279 cybersecurity startups globally in 2016, according to research firm CB Insights. That’s more than four times the dollar amount and five times the number of deals concluded in 2000, despite venture activity overall being about the same both years.

The wave of investor interest has been building since 2013, when Edward Snowden leaked a trove of National Security Agency files. Since then, venture investors have backed more than 200 cybersecurity startups every year, according to CB Insights.

The result is an unprecedented number of well-funded private companies jockeying for a slice of what research group International Data Corp. predicts will be a \$100 billion global market by 2020. “This is the modern-day gold rush that everyone wants to participate in,” says Bob Ackerman, founder of **Allegis Capital**, a venture fund that invests exclusively in cybersecurity startups. Ackerman, who’s been active in the sector for

almost 20 years, says publicity around the Heartbleed virus in 2014, along with attacks on corporations such as **Sony Pictures Entertainment**, **Target**, and **Yahoo!** and bodies like the U.S. Office of Personnel Management and the Democratic National Committee, has added to the frenzy.

Some of the newer venture-backed companies take novel approaches to long-standing problems, such as tracking down purloined data, while others address needs arising from trends like the move toward automation and the proliferation of internet-connected gear. Atlanta-based **Ionic Security Inc.** has developed the digital equivalent of the exploding dye packs banks use to tag stolen currency. Its software makes data unreadable—and therefore worthless—outside certain designated computer environments, thwarting hackers as well as employees and contractors who might steal company secrets and perhaps share them with the world on WikiLeaks.

New York City’s **SecurityScorecard Inc.** helps customers evaluate the security of vendors, such as payroll managers, lighting companies, and internet services that have access to a customer’s corporate systems. When hackers attacked Target Corp. in late 2013 and stole 40 million customer credit card numbers, they

did it through a hole in the security system of the retailer’s heating and air-conditioning vendor.

SecurityScorecard co-founder Sam Kassoumeh says the Target breach, which occurred around the time he raised his first funding round, was a nightmarish but predictable downside of otherwise helpful technological advances. Greater integration with partners may increase efficiencies and reduce costs, but it also multiplies the number of entry points available to hackers, he says.

Alex Doll, who co-founded **TenEleven Ventures** in 2015 to back cybersecurity startups, says he expects the majority of the newly minted security outfits to perish and a few to hit it big. The rest will stick it out as smaller standalone businesses or be snapped up by other companies. “A lot of these startups are really just features of a product,” he says, meaning they’re not innovative enough to justify their existence.

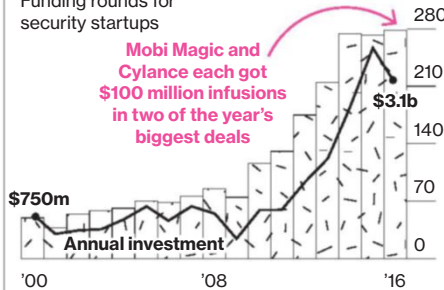
Some of the most voracious acquirers of cybersecurity startups have been their peers; CB Insights reports that more than half of the 43 deals it tallied last year fit that profile. A few companies have made it a habit: Carbon Black Inc. completed its fourth deal in less than three years with its July purchase of Confer Technologies Inc. (The acquisition amount wasn’t disclosed as both sides are private companies.)

Karim Faris, a partner at **Google Ventures**, says that while he expects the pace of dealmaking to quicken in 2017 and 2018, the universe of startups will continue to expand as corporations embrace technologies such as cloud computing and the internet of things that may expose them to more risks. “It’s easy to be alarmist when you see lots of money going in because it drives down returns on a macro level, but the fundamental need remains” for new technologies, says Faris, who’s led a half dozen of Google Ventures’ almost 20 bets on cybersecurity startups. “You need to make the humans more efficient.”

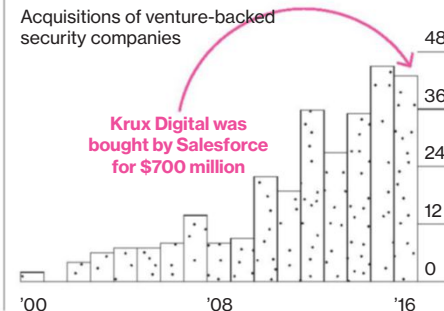
—Lizette Chapman

### Defense Buildup

Funding rounds for security startups



Acquisitions of venture-backed security companies



**The bottom line** Feeding on corporate fears of hacking attacks, investors are pumping billions into new cybersecurity companies.

# Mari

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orm-Agnostic Flavor Is™

# Big Tobacco wants to own alternative-nicotine-delivery tech and (soon-ish, maybe) quit smoking

By Felix Gillette, Jennifer Kaplan, and Sam Chambers

48

In January, Philip Morris International Inc., the largest publicly traded tobacco company in the world, relaunched its website. Front and center on the home page, a freshly fashioned statement of purpose now greets visitors: “Designing a smoke-free future.” It’s a curious ambition to claim for a company that last year sold more than \$26 billion in tobacco products. On the home page, there are no images of its familiar top sellers, no Marlboros or Virginia Slims. Instead, the page displays a provocative, open-ended question: “How long will the world’s leading cigarette company be in the cigarette business?”

Members of the press who’d been invited last fall to the Philip Morris International headquarters in Lausanne, Switzerland, for a special briefing already knew the question was top of mind at the company, even if the answer was hazy. After Chief Executive Officer André Calantzopoulos walked into the airy meeting room and introduced himself, he pulled out something called an IQOS (pronounced “I-kose”), a tobacco gizmo that’s responsible, in part, for Philip Morris’s open flirtation with a life after cigarettes. Would the assembled reporters mind, he asked, if he partook in their presence? “There is no impact to the environment,” he assured them. “There is no danger for any of you.” Assent was granted, and for the next hour, as he spoke, Calantzopoulos intermittently raised the IQOS to his lips and inhaled deeply.

To use an IQOS, you push a flavored packet of tobacco called a heatstick into the mouth of a tubular, pipelike holder, which is a bit smaller than a kazoo. When you press a button on the holder, it heats up a metal blade inside, which cooks the tobacco to roughly a third of the temperature of a traditional cigarette. Then you puff away. The tobacco is warmed

without combusting, so it doesn’t release any fire, smoke, or ash. This, in theory, makes it healthier to inhale when using heat-not-burn gadgets than when smoking, for instance, a run-of-the-mill Parliament. On the internet, various users have theorized that IQOS is an acronym for “I Quit Ordinary Smoking.” Calantzopoulos says this “was obviously not the intention.” Through a spokeswoman, the company later clarified that the name, which started with a lowercase “i,” then morphed into a combination of “IQ” with “OS,” “has no meaning in particular—it’s meant to represent quality, technology, electronics, intelligent systems—because this is not a tobacco category.”

In between heatsticks, you holster the cyberpipe in a mobile charger, a smooth, palm-size contraption that calls to mind a cigarette pack mated with a smartphone and designed by Apple’s Jony Ive. “I was a smoker before,” Calantzopoulos said as he handled a charger. “I switched to this completely, and I cannot





smoke cigarettes anymore.” Somewhere in flavor country the Marlboro Man is turning over in his grave.

Calantzopoulos was named CEO of Philip Morris International in 2013. Five years earlier the company had been spun off from its U.S. counterpart, Philip Morris, which, amid a sustained public health backlash, had rebranded as Altria Group Inc. At the time of Calantzopoulos’s ascension, profits at Philip Morris International were strong. In the fiscal year ended

December 2012, the company made \$8.8 billion of net income on \$31.3 billion of revenue. Even so, an uneasiness permeated the industry. Smoking rates were in decline among well-educated consumers in developed economies; to make up for slipping sales, the companies were raising prices, which they could do for only so long. Meanwhile, a growing number of customers were switching to e-cigarettes in the hope of escaping their addiction or preserving their health. The devices, which use battery-powered coils to vaporize nicotine-infused solutions, had leapt on the scene seemingly out of nowhere. One of the first commercially available e-cigarettes had been created circa 2003 as a smoking cessation device by a Chinese pharmacist whose father had died of lung cancer. By 2013 the e-cigarette market had \$3.7 billion in annual sales, according to Euromonitor International, and was expanding rapidly.

Philip Morris International scrambled to fashion new-fangled nicotine-delivering devices that would catch the wandering eye of the restless tobacco consumer. In 2014 the company unveiled IQOS in Japan, where it quickly gained a passionate following, and in Italy. The gadget has since expanded to 20 markets, including Canada, Germany, Romania, and Russia. According to a company spokesman, IQOS now has more than 1.4 million regular users. Executives say current smokers may be more likely to switch to an IQOS rather than to an e-cigarette, because they believe the



The heat-not-burn IQOS boxed and unboxed. You puff on the filter end.



looks like a standard cigarette. Tobacco-based inventions give the cigarette industry a considerable advantage over the fragmented, e-cig startup world, because the companies are already

well-positioned to manufacture rolled leaf on a massive scale. Calantzopoulos notes that his company has a handful of other “platforms” also coming to market. Altogether, it’s spent more than \$3 billion on these developments.

This commitment to next-generation nicotine delivery has manifested itself in a \$111 million, environmentally progressive research center called the Cube, which hugs the shoreline of Lake Neuchâtel in western Switzerland, a 45-minute train ride from headquarters. The Cube features a translucent glass facade, passive solar heating, and extensive gardens. It has three wings, named Earth, Wind, and Air. Pointedly, there is no Fire. It is the heat-not-burn of contemporary European architecture.

Philip Morris executives say they’re firmly committed to the sunset of cigarettes. When asked for specifics, however, they shy away from a hard deadline. “I hope it’s not going to take that long,” Calantzopoulos says. “At a certain stage, once people see everybody around them using these new products, I think that constantly accelerates the process. It becomes a self-fulfilling prophecy.”

Healthy advertising and marketing budgets will help the prophecy fulfill itself more quickly. Over the past two years, to nurture its community of IQOS users, Philip Morris has opened a series of retail stores throughout Europe and Asia. The IQOS store in London sits on a hip commercial stretch in Soho. A modish sculpture, vaguely celestial, hangs in the storefront window. Inside, IQOS devices are perched atop rugged pine shelving, beckoning to visitors. “Product experts,” dressed in neutral-toned uniforms, circulate offering “guided trials.” On the store’s lower level, there’s a communal workspace where IQOS devotees can get together to inhale on heatsticks while indulging in free beverages and Wi-Fi. The overall effect is one part Nespresso Boutique, one part Apple Store, one part Pret A Manger.

A 20-pack of heatsticks goes for about £8 (\$10), and the device itself costs about

nia slims

£45. An IQOS comes in a white box, adorned with an image of the brand's spirit animal: a vivid, blue-green hummingbird in midflight. A company spokesperson says the hummingbird—nimble, aesthetically fetching, and disruptive (of stinging insects)—is an ancient symbol of tobacco and one that's meant to convey a sense of movement and transformation. Opening an IQOS's packaging, with its various glossy parts nestled in thin plastic liners set in molded compartments, beneath which lies the requisite nest of cords, is like unboxing an iPhone.

Phillip Morris isn't the only multinational tobacco company to catch innovation fever. Mature industries typically have a hard time disrupting themselves, but, flush with cigarette profits, the big competitors have decided to try. Since the rise of e-cigarettes, it's no longer such a stretch to imagine a messianic engineer in a garage somewhere inventing a nicotine-delivery gadget capable of doing to cigarettes what Uber did to taxicabs or Napster did to the compact disc. If your profits hinge on nicotine addicts, you might want that visionary in your employ. Everywhere you look in the industry, companies are pouring money into product development while borrowing liberally from the style of Silicon Valley. They're funding tech incubators, running venture funds, hosting TED-style talks, and developing apps. The new dogma has spread. Cigarettes are the industry's past. Reduced-risk tobacco platforms are the user interface of the future.

Tobacco executives often sound like media owners talking about content. That is, they're open to delivering their drug via whatever pipe the consumer chooses—be it e-cigarettes, heat-not-burn devices, gum, lozenges, dip, or some medium that hasn't been invented yet. They are, as the media gurus would say, "platform-agnostic."

"Consumer behavior is changing, competitors are taking action, the environment keeps changing so quickly," says Yasuhiro Nakajima, vice president for emerging products at Japan Tobacco Inc. "Unless we are quick, we can't be part of the game."

In 2014, Reynolds American Inc., the second-largest tobacco company in America, rolled out Vuse, its first e-cigarette brand, nationwide. Sales grew fast. In January 2016, Reynolds stepped up its commitment, announcing the creation of a subsidiary called RAI Innovations Co. devoted to the development of cutting-edge nicotine and vaping products. The company named Carolyn Hanigan as its first president. Hanigan, who's

# Lucky

45, had never worked in tobacco before. But she had marketing experience at big consumer-facing companies such as Mars and Nestlé and most recently was a vice president at Swander Pace Capital, a Bay Area-based private equity firm with holdings in consumer-products companies. She drove an electric car. When juice cleanses became all the rage, she leaned in. Moving forward, she would lead Reynolds's quest to invent the next great nicotine product—ideally, some sort of killer tobacco app that doesn't kill.

Hanigan relocated to Winston-Salem, N.C., and got to work setting up Reynolds's tobacco-tech skunk works. The company carved out a space in its existing research and development center and gave it a sleek retrofitting that included concrete floors, exposed piping, a workshop, a 3D printer, midcentury modern furniture designed by Eero Saarinen and Hans Wegner, and a vapor lounge. (Not marijuana-compatible. Big Tobacco's devices have the vaping material locked in, as the iPhone locks a SIM card, so users can't change the liquid inside. At least, until someone figures out how to jailbreak them.) On one wall, spelled out in white lettering against a dark background, is the phrase "The future begins now." Hanigan recalls that one time last year, Reynolds CEO Susan Cameron walked into the emerging innovation zone and reacted favorably. "She said, 'I feel like I'm in New York,'" Hanigan says. "And I said, 'Good. I feel like I'm in San Francisco!'"

It didn't take long for Reynolds to receive a major vote of confidence. On Jan. 17, Nicandro Durante, the CEO of British

American Tobacco, announced that the company had reached an agreement to pay \$49.4 billion for the 57.8 percent of Reynolds American that it didn't already own. If approved by shareholders, the acquisition would make British American Tobacco even bigger than Philip Morris. On a conference call with analysts, Durante said he was delighted. The combined company would control a rich portfolio of cigarette brands—Pall Mall, Lucky Strike, Camel, Newport, Dunhill, Natural American Spirits—with a "unique geographic footprint,"



# Strike

spanning the globe from Asia to Africa to the Middle East to the U.S. “By combining these two companies,” Durante said, “we’ll be creating a stronger, truly global tobacco and next-generation products company.”

The deal, Durante explained, wasn’t only about scale. It was also about the future of smokeless nicotine. In 2013, British American Tobacco introduced its first e-cig, Vype, which has since grown into one of the most popular vaping brands in Europe. In December 2016, the company started selling a silvery heat-not-burn device in Japan called Glo. BAT now sells “next-gen” products in 12 countries and plans to qua-

vaping and e-cigs. Ironically, this makes it a good time for Altria/Philip Morris and BAT to push hard into the market since they have the capital to wend through a regulatory maze. All tobacco products released after 2007—including e-cigarettes—must now seek the regulatory agency’s permission to remain on store shelves. Companies have 24 months to file premarket applications for items already on the market, and the FDA has a year to review the submissions.

Jan Verleur, co-founder and CEO of VMR Products LLC, owner of V2, the largest independent e-cigarette brand in the U.S., accuses the FDA of becoming “the handmaiden of Big Tobacco.” He estimates that going through the approval process will cost his company from \$300,000 to \$1 million per product. That’s more, he says, than most independent vaping companies can afford. He says he hopes that at the least Congress will tweak the FDA regulations to grandfather in all tobacco products released prior to August 2016. “A

higher barrier to entry to bring new technology to market in the sector is a very, very good thing for Big Tobacco,” Verleur says. In other words, big tobacco companies are embracing the trappings of startup culture at a time when the new regulations have genuinely independent, lean vaping startups on the run. “It’s going to be an arms race,” says Nik Modi, an analyst with RBC Capital Markets. “Who has the best technology, the best science? Who can get their applications through the FDA the quickest? We’re not in a pricing war. We’re in an innovation war.”

Altria is working with Philip Morris International to bring IQOS to the U.S. under a licensing agreement. Philip Morris

“She said, ‘I feel like I’m in New York.’ And I said, ‘Good. I feel like I’m in San Francisco!’”

druple that figure over the next two years. The combination with Reynolds’s next-gen device shop, Durante said, would create a powerful vortex of tobacco innovation—one giant R&D tornado that could blow away the competition and achieve global tobacco-tech supremacy.

Global domination requires conquering America, the largest source of smoke revenue next to China, which has its own state-run megaplayer, China Tobacco International Inc. At the moment a little more than half of all electronic smoking devices in the U.S. are sold by either Reynolds American (42.2 percent) or Altria (12.6 percent), according to data from Bloomberg Intelligence. Last year the Food and Drug Administration decided to try to regulate the wild west of

is planning to have its application in to the FDA by the end of March for the basic approval now required to be on shelves. The FDA promises to address such applications within a year. Back in December, Philip Morris submitted almost 2 million pages in support of a separate application that could designate the IQOS as a “modified risk” tobacco product. (The FDA offers no time frame for processing this one.) If the effort passes muster, the device could become the first tobacco product to receive this determination. The aura of (relative) healthiness would give IQOS a market edge, but Altria plans to begin selling IQOS in the U.S., with or without it, in late 2017 or early 2018.

On Feb. 22, during a speech at an investor conference in Boca Raton, Fla., Altria CEO Marty Barrington noted that the company is developing its U.S. marketing strategy. The plan,



# Newport

he said, will include “flexible retail concepts” offering “guided trials.” He proceeded to show the audience glam shots of the sumptuous IQOS stores in Japan and Italy.

In a conference room at Altria’s Center for Research and Technology in Richmond, Va., Jose Murillo, an Altria executive who oversees FDA-related regulatory strategies, discusses how the agency’s involvement plays into the company’s goals for post-smoke America. Murillo reaches across the table and grabs a pack of Verve, a flavored nicotine lozenge, which Altria began testing in Richmond-area stores a few years ago. He pops one in his mouth. It’s one of several smoking alternatives he’s excited about. “There’s a lot of opportunity to move smokers along—subject to FDA review—something we call the continuum of risks,” Murillo says. “You have to know what the consumer is looking for. You have to match technology to product. And you have to have a regulatory path to get to market.”

Murillo says that whichever direction consumers zag, Altria will follow. He points out that the company has long been adept at coming up with better ways of syncing nicotine with the human bloodstream. The breakthroughs have included machine-rolled cigarettes, filters, flip-top boxes, and dip in a can. “We’ve been through any number of disruptions,” he says. The industry, after all, was an early supporter of disruption, having created the smoke break. “We have a track record of being able to evolve with the changing times.”

The company operates a fund called Altria Ventures, which, according to its website, invests in startups focusing on “mobile coupons, augmented reality, digital Point-of-Sale, beacon technology, battery technology, data security, age and identification verification, inventory and product intelligence.” Altria also hunts for strategic acquisitions. In 2014, Nu Mark—an Altria subsidiary focused on smokeless tobacco alternatives—acquired e-cigarette maker Green Smoke for approximately \$110 million. “Green Smoke had a lot of supply chain expertise that we were looking for and an excellent online customer interface,” Murillo says. “Their headquarters are located in Israel, right there in the high-tech area between Tel Aviv and Jerusalem, which gave us access to a lot of leading engineers and electronic experts.”

Antismoking groups are watching all of this warily. In general, they support efforts by the industry to get smokers to transition to reduced-risk tobacco products. Although the medical community doesn’t have a comprehensive understanding of the health effects of the various new tools, a study in the February 2017 *Annals of Internal Medicine* found that former smokers who

switched to e-cigarettes “substantially reduced” their levels of carcinogens and toxins. Around the same time, several studies came out that indicated teenagers’ vaping increased their likelihood of becoming cigarette smokers. Under pressure from antismoking advocacy groups, the FDA last year included in its regulatory changes a rule banning e-cigarette sales to minors.

Critics also don’t see much change in how the industry is promoting its legacy product. “Philip Morris, for example, has talked about envisioning a society someday without cigarettes,” says Matthew Myers, the president of the Campaign for Tobacco-Free Kids. “But they have never marketed traditional cigarettes more aggressively than we’re seeing them do in low- and middle-income countries across the globe.” Executives at BAT, more subdued on the topic of a smoke-free future, said recently that they were also willing to keep selling cigarettes, forever and ever, if that’s the will of the people.

Almost 80 percent of the world’s 1 billion smokers now live in low- and middle-income countries, according to the World Health Organization. In the U.S., the Centers for Disease Control and Prevention’s 2015 numbers showed that almost twice as many adults living below the poverty line than those above it smoked. Only 3.6 percent of adults with a graduate degree smoked cigarettes compared with 34.1 percent of GED-certificate holders. And for now, cigarettes continue to be the lifeblood of the industry. According to estimates from Euromonitor International, the global market for cigarettes in 2017 will be \$717 billion vs. a mere \$11.2 billion for all vapor and heated tobacco products combined.

Robin Koval, the president and CEO of the nonprofit Truth Initiative, says the arrival of extravagant nicotine-delivering gadgets could be an attempt to win back the kind of wealthier, upscale consumers who are no longer reliably using tobacco. The stylish devices could seduce a new fan base among white-collar, cosmopolitan types by differentiating the tobacco experience from déclassé, overtly unhealthy cigarettes. The move into tech, she points out, is also likely to help cigarette makers overcome some of the stigma of working in a field whose core product remains the leading cause of preventable disease and death in the U.S., according to the CDC, killing almost 500,000 people a year.

Promoting a job with Big Tobacco as a job at the tech frontier has been effective, at least according to David O’Reilly, the head of science and R&D at BAT, who says youngsters are now lining up to join the revolution. The company’s 2017 “graduate entry program” in England (positions usually held by twentysomethings just out of university), he says, saw applications double from last year. “It used to be very difficult to recruit for this sector, but now the quality of the talent we can



get is world-class,” he says. “For a scientist who starts working with us today, they’re told, ‘The world is your oyster. History is yours to write.’ It’s about inventing the future.”

Altria’s Murillo also says his company has created an environment where code jockeys and art school grads alike feel at home inventing this future. “When I started Nu Mark, we visited people who were working for us—potential acquisition targets, venture accelerators, startups, and so forth—and I stole shamelessly,” he says. “Look at what they do for the lunchroom! And look at these chairs! The idea was to make sure that people realize that we are a startup, we are an innovation company.” Altria’s nicotine ninjas are offered a range of activities to stay stimulated. In Richmond the company hosts art shows, throws live music performances, and sponsors an in-house robotics competition. “We have a lot of left-brain, right-brain activities,” Murillo says. “It’s an amazing time.”

Quitting cigarettes is never easy though. The cigarette manufacturers are still mostly novices when it comes to electronics.

There have already been some slip-ups. In March 2016, Japan Tobacco failed to meet deliveries of its futuristic vaporizer, called Ploom Tech, when the company unexpectedly couldn’t keep pace with demand. When Philip Morris introduced IQOS in Japan, the company set up a call center designed to handle as many as 30,000 calls. Instead, it received about 1 million, overwhelming the system. Earlier this year, BAT abandoned development of a nicotine inhaler called Voke, because it proved to be too complex for the company to produce on a large scale.

Despite the early coughing fits, the industry keeps huffing forward. In February, Jacek Olczak, Philip Morris International’s chief financial officer, told investors that an IQOS update was in the works for the second quarter of 2017. “New features of the device will include an improved user interface and a significant reduction in the holder’s charging time,” he said. “The new version will also provide connectivity and access to an IQOS app.”

Not to be outdone, Reynolds has integrated Bluetooth wireless technology into two of its e-cigarette products. From

a free smartphone app, users can track battery life or how many puffs they’ve taken that day. “VUSE is the most advanced e-cigarette and the first e-cigarette designed with Smart Technology,” the brand explains on its website. “The Vuse digital Vapor Cigarette contains a vapor delivery processor that uses algorithms in the same way a computer does, therefore it is ‘digital.’”

But in cigarettes, as in music and news, the shift away from analog is more of a process than a pivot. Murillo points out that Altria has been developing heat-not-burn technology for several decades, but only recently have the consumer and regulatory conditions grown favorable for widespread adoption. In 1998, Philip Morris started selling a heat-not-burn device called Accord. Despite the company’s high hopes, the Accord flopped. “It was very cutting-edge for its time,” Murillo says. “But consumers were like, what do I do with it? What does it do for me? Is this less harmful? We couldn’t talk about any of that.”

Also, the Accord looked, somewhat distressingly, like an old-school car phone choking on a half-swallowed cigarette. Every cutting edge company has its fail-fast experience, but Murillo suggests that Altria doesn’t intend to make that kind of mistake again. “Design is essential. I’m a big fan of what Apple has done. We try and bring that to all of our product development,” he says.

“We’ve had to bring in talent in terms of design,” echoes Hanigan over at Reynolds. “These need to look like an everyday product, like an iPhone or a Fitbit or a pair of Ray-Bans.” **B**



Altria's Center for Research and Technology in Richmond, Va., (top) and Philip Morris's Cube in Neuchâtel, Switzerland (bottom)



# HOW TO

# AN

# INTERNATIONAL

**HAROLD VILCHES, A 23-YEAR-OLD CHILEAN, EXPORTED \$80 MILLION IN CONTRABAND GOLD. IT ALL STARTED WITH A GOOGLE SEARCH**

**BY MICHAEL SMITH AND JONATHAN FRANKLIN  
PHOTOGRAPH BY TOMAS MUNITA**



BECOME



AL

GOLD  
SMUGGLER



**A**s the minutes ticked by on the afternoon of April 28, 2015, Harold Vilches watched stoically while customs officers at Santiago's international airport scrutinized his carry-on. Inside the roller bag was 44 pounds of solid gold, worth almost \$800,000, and all the baby-faced, 21-year-old college student wanted was clearance to get on a red-eye to Miami. Vilches had arrived at the airport six hours early because he thought there might be some trouble—he'd heard that customs had recently seized shipments from competing smugglers. But Vilches had done this run, or sent people to do it, more than a dozen times, and he'd prepared his falsified export paperwork with extra care. He was pretty sure he wouldn't have any trouble. While he waited, he texted his contacts in Florida, telling them he'd already cleared customs.

The plan was to hand off the gold at the Miami airport to a pair of guards, who would load it into an armored truck for the short trip to NTR Metals Miami LLC, a company that buys gold in quantities large and small and sells it into the global supply chain. The modesty of its shabby office, where a receptionist sits

An illegal mine in Peru. The primary tools in this type of mining are fire hoses and mercury



behind an inch-thick acrylic barrier, belies the amount of business that goes on inside. U.S. Department of Justice investigators believe NTR Metals Miami has bought at least \$3 billion in South American gold in the past four years, much of it from illegal mining operations, people familiar with the investigation say.

Vilches didn't need this headache. In just two years he had rapidly risen in the ranks of Latin American gold smugglers. Although he was barely old enough to order a beer in Miami, he'd won a \$101 million contract to supply a gold dealer in Dubai. That hadn't exactly worked out—the Dubai company was after him for \$5.2 million it says he misappropriated—but still, in a brief career he'd acquired and then resold more than 4,000 lb. of gold, according to Chilean prosecutors. U.S. investigators and Chilean prosecutors suspect almost all of it was contraband.

That evening at the airport, Vilches employed his standard cover story, saying that the gold came from coins acquired from customers and recast as ingots. The customs officers weren't buying it. The laboratory Vilches had used to vouch for the gold wasn't government-certified, they said, and they doubted his claims that the gold had come from coins. Vilches was irate. He

couldn't believe it when the man behind the desk called his boss and then relayed orders from above: If it's Vilches's gold, seize it.

Investigators with the *Policía de Investigaciones*, Chile's equivalent of the FBI, had been monitoring Vilches for months, intercepting his phone calls and scouring the export papers he'd submitted. The kid was clever, they agreed, but who was he working for? "I thought there was someone behind him, always," says José Luis Pérez, a Chilean prosecutor on the case.

After the airport officials confiscated Vilches's gold, they let him go. For the next 15 months, Chilean authorities allowed Vilches to bring illegal gold in and ship it out as they built a case, searching for associates and those above him. They listened in on various telephones, read Vilches's text messages, and followed couriers. They watched as smugglers brought gold south from Peru, across remote stretches of desert and through valleys in the Andes Mountains, or west from Argentina, driving over the snowy mountain pass in the shadow of 22,800-foot-high Aconcagua, then down to Santiago and Vilches's headquarters, a place police nicknamed "The Bunker." Inside, Vilches assayed, weighed, and paid for the gold. He melted it down and recast it as ingots, then flew it, or used a family member to fly it, to Miami.

To their growing amazement, the police never found the larger organization they presumed was supporting and protecting Vilches. There was, as far as they could determine, no bigger fish. Finally, in August 2016, they arrested him. Investigators say they have documented \$80 million in gold shipments that moved through his hands via eight shell companies he established in Chile and Miami—and they think there was much more. They charged Vilches and four associates, including his wife and her father, with racketeering, smuggling, customs fraud, and money laundering. None of them have been tried, and the case remains open. Vilches's wife and father-in-law declined through their lawyer to comment. Today, Vilches lives with his wife in an apartment in a rundown part of Santiago; he's under house arrest from 10 p.m. to 6 a.m.

In exchange for his release from jail, Vilches provided extensive testimony that has allowed Chilean prosecutors and the U.S. Department of Justice to try to build a huge, multinational gold smuggling case. Interviews with police and prosecutors in Chile and the U.S. and hundreds of pages of police files describe Vilches's part in a black market that adds literally tons of illegally mined and contraband gold to the international economy every year.

In the past decade and a half, global gold consumption has risen by almost 1,000 tons a year, to about 4,300 tons, according to the World Gold Council, a London-based industry group. Legal mining operations haven't kept up with demand, so illegal mines controlled by criminal gangs, from the Amazon to central Africa, help cover the deficit, according to Verité, a nonprofit group in Amherst, Mass., that's researched the illegal gold trade. A 2016 Verité study found that five countries in Latin America shipped 40 tons of gold from illegal mines to the U.S. in one year, almost twice the legal exports from those countries. South America's illegal gold mines, most of them in the Amazon basin, are toxic pits in which mobs of laborers use fire hoses and mercury to extract nearly pure gold nuggets from the red earth. According to a finding by the United Nations, the industry thrives on child labor, devastates the environment, and enables prostitution at



ramshackle camps around the mines. The gold moves from smuggler to smuggler, then into a network of refiners and traders, all feeding the world's voracious demand.

**V**ilches, a city kid, never saw any of this, but he did grow up around gold. His father, Mario, owns a jewelry shop; his uncle Enrique, an evangelical preacher, built Joyas Barón, a chain of 18 jewelry stores. Enrique has more than once attracted the attention of the authorities. In 1998, Chilean prosecutors caught Ecuadorean smugglers with 18 ingots of gold at the airport, and they claimed to be delivering it to Enrique. (He was cleared of all criminal charges after arguing that police set him up.)

In March 2015, Enrique was sentenced to five years' probation for tax fraud by an appeals court in Santiago. Last year tax authorities filed further charges alleging that Enrique had organized an enormous accounting scam and owed an estimated \$18 million in back taxes. Speaking on Chilean TV, Enrique Vilches denied all connections to his nephew's gold smuggling. "I don't have any commercial relationship with what's being investigated," he said. "[There's] no situation that involves me, therefore I want to remain absolutely separated from this situation."

By 15, Harold was working for his father's business. Within a year, his dad was stuffing his backpack with up to 50 million pesos (\$78,000) in cash and sending him to the bank to make deposits. In 2013, Vilches entered college at the Universidad Mayor in Santiago to study business administration. He hadn't been there long when his father had a stroke, and he cut back his classwork to focus on the family business. If he was going to be doing that, he decided, he wanted to do more than buy and sell trinkets. He intended to make some real money, and that meant getting into the bulk gold business.

His first move was to persuade Gonzalo Farias, a metals exporter in Santiago, to take him on as a supplier. In September 2013, Vilches made his first delivery to Farias—6.6 lb. of gold legally acquired in Chile. He made several more such deliveries. But he wanted to be bigger. He went around Farias and cut a deal directly with Fujairah Gold, a Dubai-based company that Farias supplied. In June 2014, Vilches signed a contract to deliver 6,000 lb. of gold over the next 12 months to Fujairah's head office. The contract began with 90 lb. the first month, then ratcheted up. He didn't have the money to buy that much gold, so the company gave him access to an account holding \$5.2 million. This was his big break—the contract was potentially worth more than \$100 million. He stood to make \$2 million to \$6 million in profit.

This was beyond ambitious for Vilches—there weren't enough available gold coins and jewelry in Chile to fill Fujairah's orders. So Vilches decided to become a smuggler. It was easy: He Googled gold dealers in Peru. He found Rodolfo Soria Cipriano, one of the country's most prolific exporters, according to Peruvian newspaper *El Comercial*. An answer came quickly. Vilches told investigators Soria promised to set him up with all the gold he wanted if he showed up with the cash. Vilches said he didn't ask where the gold came from. Whatever its source, he evaded export controls and moved the gold into Chile without paying taxes or duties, prosecutors say.

Soria made introductions to a network of suppliers, with whom Vilches later arranged buys via WhatsApp messages. Once the gold was ready for pickup, he would fly to Arica, in northern Chile, where he kept a Mazda sedan expressly for trips into Peru. On at least 10 trips, beginning in the middle of 2014,

Gold seized in 2014 from Vilches's couriers. They were trying to bring 48 kilos to Santiago.



Vilches says, he and his father-in-law drove across the border to the city of Tacna, a few miles inside Peru, with the door panels of their car stuffed with cash, as much as \$2 million at a time.

Vilches bragged to prosecutors that he moved with ease in the criminal world. With relish, he described making a buy at a safe house in Tacna. While his father-in-law waited outside in the car, Vilches was escorted by armed men through multiple metal detectors and locked gates before arriving at a secure room that held a huge stash of gold. He suspected the house doubled as a cocaine dealing operation, he told prosecutors, but he kept his cool. He tested the gold for purity, then went back outside, packed the contraband into the door panels of the Mazda, and drove back to Chile.

Vilches began making as many as five gold runs a month to Peru and also hired couriers, who delivered to him directly in Santiago. It added up to enough to allow him to make several successful deliveries to Fujairah using air cargo companies. Then, in August 2014, customs agents at the airport in Arica stopped a pair of his couriers with 105 lb. of gold. The paperwork and the duo's explanations about how they'd obtained the gold didn't add up. The gold was seized, and Vilches was looking at his first legal trouble: a tax-evasion case, which has yet to be resolved.

Vilches decided to abandon Fujairah. Fulfilling the contract would require dozens of buying trips or courier runs, and getting the gold to Dubai would involve massive logistical challenges. When the company asked about its overdue deliveries, Vilches invented excuses. But lawyers for Fujairah were convinced he was lying. They suspected he was selling to other companies on the side. Fujairah also came to the conclusion that the gold was illegal.

Almost two years later, Vilches faced his first criminal charges, for fraud and appropriating \$5.2 million from Fujairah Gold. Through his lawyer, Marko Magdic, Vilches denied the charges and said the only issue was a breach of contract. Fujairah continues to press claims in court to recover the money.

**A**s his relationship with Fujairah deteriorated, Vilches sought new buyers. He knew some of his Chilean clients were selling the gold he brought from Peru to NTR Metals in Miami. Soria, he told prosecutors, made an introduction. "I was cleared by the company's compliance committee in more or less three weeks," he told the FBI. Trey Gum, general counsel for Elemetal LLC, NTR's parent company, says the company established a relationship with Vilches only after its representatives visited his companies in Chile. "The information NTR Miami received was that Mr. Vilches came from a family of established jewelers with close ties to the evangelical community in Chile,"

Gum said in an emailed statement. Soria couldn't be reached for comment. The offices of his company in Lima appear to have shut down, and its phone numbers are out of service.

Vilches told prosecutors he then went to Florida and met with two NTR executives: Renato Rodriguez, executive sales director for Latin America, and Samer Barrage, who oversees the Miami operation. They sat down together at a restaurant in Coral Gables. "They knew something was up with my gold because it was so pure. ... A few months later I expressly told them it was contraband gold," Vilches said. He also told prosecutors that Rodriguez and Barrage coached him on falsifying customs paperwork.

None of this is true, according to Rodriguez and Barrage. Standing in the lobby of NTR's Miami office, Rodriguez says the company trusted the documentation Vilches provided—as did, he points out, customs officials in Chile and the U.S. "All that stuff is made up," he said. Barrage said in an email: "I want to be emphatically clear at no point did I have any knowledge whatsoever regarding his metal being sourced from illegal mining operations. There was absolutely no coaching or involvement regarding his export process or import process for that matter."

To maximize the appearance of legitimacy, Vilches wanted to cast his gold into brick-size ingots, with a seal identifying the weight and purity. It was a challenge—he'd watched his father do it, but he had almost no idea how to manage it himself. When he plugged in an imported machine to melt the gold, it shorted out and filled his office with black smoke; he'd neglected to buy a transformer so the equipment would work with Chile's higher-voltage electrical system. Eventually, Vilches says, he and his father-in-law taught themselves how to make the ingots by watching YouTube videos.

In December 2014, Vilches made his first delivery to NTR Metals Miami, with a suitcase full of gold bars. That was how he capped his first full year in business, during which he shipped 3,119 lb. of gold valued at \$57.4 million, export records cited in the criminal investigation show. Chilean investigators later cited 10 shipments from Vilches to NTR as clearly illegal because of falsifications in customs declarations and failure to pay taxes and duties on the initial importation of the gold.

Vilches was game. If he could pull it off, he'd be moving an estimated \$20 million a month in dirty gold. But it was going to be complicated. "What they told me is that, because of compliance policies, they could not receive African gold," Vilches told the FBI. "So they proposed that I export from Africa to Chile and then send it to Miami to NTR Metals."

Vilches flew to Dar es Salaam in Tanzania, where he spent almost a month viewing stashes of gold and negotiating with South African and Cameroon-based traders. He told the FBI he "maintained constant communications with Renato and Samer" about possible shipping routes. But he got scammed out of \$300,000 by someone he thought was a supplier. The entire Tanzania affair unnerved him. At one point, he told the FBI, he was accosted by two carloads of armed men—probably government security forces, he thought—and held for hours in a grimy room while being interrogated about his business in Tanzania. He was relieved to escape with his life.

Rodriguez and Barrage denied suggesting Vilches go to Africa. "In fact, in 2015 he asked if we purchased from Africa," Rodriguez wrote in an email. "I unequivocally told him no and that it was a policy of NTR not to do so." Barrage wrote: "There was ... no encouragement to source gold from Africa."

Despite the setbacks in Tanzania, Vilches had a good 2015. He spent his money on a \$1 million home adjacent to a lake with lilies and swans. He also invested \$150,000 in a fortified building in Recoleta, a Santiago neighborhood where stray dogs roam streets strewn with trash. Graffiti-covered 12-foot walls topped with barbed wire surrounded a two-story building outfitted with Level 5 bulletproof glass and armored metal doors. Steel-reinforced walls and an array of 32 security cameras protected an inner sanctum. The final touch was a pepper spray system. "Even in a bank you don't see such high-quality protection and security measures," says Pérez, the Chilean prosecutor.

It was here that Vilches toiled, usually alone, transforming his gold into the standard-size ingots needed to avoid raising suspicions at customs. He marked each with the precise weight and purity and added the seal of Aurum Metals LLC, a company he'd



# VILCHES'S CONFESSIONS TOOK ON THE AIR OF A PERFORMANCE. "ALL YOU LACKED WAS THE POPCORN"

Chilean prosecutors say they have evidence NTR was aware the gold was illegal or contraband based on Vilches's statements and his telephone, email, and text communications, all of which they've shared with U.S. investigators. "NTR knows the gold is illegal. It's cheaper than legitimate gold. That's the business," says Tufit Bufadel, a Chilean prosecutor involved in the case.

In early 2015, Vilches told the FBI, Rodriguez and Barrage summoned him to Miami to make a bold proposal. "They asked me to find a gold supplier in Africa," he said. According to Vilches, the NTR executives proposed that he try to arrange a 1,000-kilogram-per-month smuggling operation.

set up in Miami. It was also in the bunker that Vilches stashed cash and falsified documentation for the gold.

Vilches told prosecutors that the NTR executives advised him to make videos of the refining process to better support his claims that the gold came from legal sources. He did that, and his marketing brochures carried photos of himself grinning while pouring liquid from a flask like a high school chemistry student, except that the flask was filled with liquid gold.

NTR Metals Miami is one of the 49 offices of NTR Metals, also known as Element Direct, one of eight divisions of Dallas-based Element LLC. Element Direct sells its gold as 99.99 percent pure





The bunker where Vilches processed gold and dummed up paperwork

bullion—and certified as coming from legal mines by industry groups.

Those groups include the London Bullion Market Association, or LBMA, the industry's self-regulating body, which counts officials from major banks and gold traders on its board. Elemetal dedicates a section of its website to certifications of quality and origin, including a copy of the LBMA's "responsible gold certificate" from a "third-party audit of the company's supply chain due diligence." LBMA spokesman Aelred Connelly declined to comment about Elemetal's certification.

Another certificate comes from the Conflict-Free Sourcing Initiative of the Electronic Industry Citizenship Coalition, or EICC. It's for Elemetal's gold smelter in Jackson, Ohio. To renew the certification each year, Elemetal hires auditors to review purchase and import records, tour the smelter, and interview employees about the source of purchased gold. The mission is to assure that no gold comes from illegal mines that give rise to prostitution, labor abuses, and environmental damage or fund illegal activities or war, especially in Latin America, says Leah Butler, director of the conflict-free smelter program at the EICC. "We know that gold from Latin America is high-risk," says Butler. She declined to comment on Elemetal, citing EICC rules. The organization "takes allegations of wrongdoing by any smelter or refiner in its program very seriously," she says.

Amjad Rihan, a former Ernst & Young auditor who specializes in researching commodity supply chains, says it's easy to fool auditors. Rihan now works for Martello Risk, a London consulting firm that helps companies scour supply lines for illegal minerals. "The problem is these audits really don't go beyond the paperwork," he says.

These seals of approval are critical across the industry. Under U.S. and European law, corporations must ensure their suppliers aren't buying from mines that fund conflict. So they source gold from companies that are certified as having clean supply chains. Elemetal's certified smelter is a valuable asset that allowed the company to supply 68 Fortune 500 companies in 2015, including Alphabet, Apple, Ford, GE, GM, and HP, according to a Verité analysis of corporate conflict minerals reports, which are required under the U.S. Dodd-Frank Act.

According to Gum, Elemetal's lawyer, NTR Metals Miami stopped doing business with Vilches on June 1, 2016, the day the fraud charge against him was filed, and "reported the matter to appropriate governmental authorities." Elemetal also, "as a precautionary measure," ordered NTR Metals Miami to "suspend all operations in Chile pending a review of current risks and procedures in that country," Gum says.

**O**n the night everything began to fall apart, when agents at the Santiago airport seized the five ingots in his carry-on, Vilches immediately called NTR, he told FBI investigators. Rodriguez and Barrage suggested, he said, that he forget about ever seeing that gold again and concentrate on getting the paperwork right the next time. NTR executives "gave me instructions to keep U.S. Customs from realizing my certificates of origin were false," Vilches said.

It seemed to work, for quite a while. Chilean police were itching to bust him, but prosecutors ordered detectives to stand down to gather more evidence. They were reluctant to give up on the idea of snagging someone higher than Vilches. And so he both imported and exported dirty gold without interruption.

The net began to close in early 2016, when banks in Chile and Miami began filing suspicious-activity reports on Vilches's huge cash transactions and shutting down his accounts. Then came the criminal complaint involving the Fujairah Gold contract. Finally, police arrested Vilches and seized \$300,000 in cash and a small amount of gold from the bunker. Facing a multiyear jail sentence for money laundering and tax evasion, Vilches agreed to cooperate with law enforcement in both the U.S. and Chile. He also dropped out of college. Today Vilches and NTR Metals are at the center of a sweeping criminal investigation by the U.S. Justice Department, Chile's National Economic Prosecutor's office, and law enforcement in Peru and Ecuador, according to Pérez, the Chilean prosecutor. Sarah Schall, a spokeswoman for the U.S. Attorney's Office in Miami, declined to comment, citing policy against confirming or denying the existence of an investigation.

In October 2016, FBI agents and prosecutors with the U.S. Attorney's Office in Miami traveled to Chile to interview Vilches. After becoming convinced his information was legitimate, they told him he might get immunity in the U.S. from prosecution in exchange for his sworn testimony, people with knowledge of the probe say. As Vilches spent hour after hour in interrogation, FBI agents and Chilean detectives were both fascinated and entertained. Upwards of 15 law enforcement professionals crowded into a meeting room at Santiago 1, a sprawling prison complex, and Vilches fed off the attention. He laughed and seemed to shrug off the seriousness of his situation. His confessions took on the air of a performance, according to one of the investigators present. "All you lacked was the popcorn," he says with a laugh. FBI agent Lourdes McLoughlin, the assistant legal attaché at the U.S. embassy in Santiago, declined to comment, citing a policy of not commenting on active investigations.

In December the U.S. Attorney's Office and FBI brought Vilches to Miami, where he told a federal grand jury that he was coached by NTR Metals Miami on how to set up his corporate structure in the U.S. to handle smuggled gold and then launder the proceeds, people familiar with the U.S. probe say. Elemetal and NTR Metals Miami didn't respond to questions about an investigation.

Vilches lived large only briefly. He's traded down to an apartment along Gran Avenida, a thoroughfare in a tough Santiago neighborhood. Because of his cooperation, he's unlikely to face additional jail time for smuggling. He still faces multiple criminal charges, including tax evasion.

Chilean export regulations have been beefed up in the wake of the Vilches case. One gold dealer describes the new export process as similar to "being told to stand up against the wall and put your hands up." Customs officials from Ecuador, Bolivia, and Peru have visited Chile to exchange information and compare notes. Pérez approves, but he has no illusions. If Vilches, without any particular advantages except his boldness, could get this far in the illegal gold trade, who else could? "I think there are 100 Vilcheses across Latin America," he says. "It's easier than it looks." **B**



The makers of prescription promethazine codeine cough syrups—the fuel for purple drank—have become hip-hop icons



corporations

corporations





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By Timothy Bella

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Photograph by Grant Cornett

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Inside the recording studio at Screwed Up Records & Tapes, William Gibbs lights up a Black & Mild and pauses to consider how long he's been sipping. Next to Gibbs—who's better known as Will-Lean, a member of the legendary Houston hip-hop collective Screwed Up Click—is a tall, white Styrofoam cup.

The concoction inside mixes Faygo Redpop, a strawberry-flavored cream soda, and promethazine codeine cough syrup, a prescription pain reliever and cough suppressant that's also the main ingredient for any number of similar cocktails referred to as "drank," "purple stuff," "lean," and "sizzurp," among other names.

Gibbs decides he's been sipping since the mid-'90s. "I feel like I'm checking myself into rehab or something," he says as he ponders his history. "I don't get high. I just drink it for the taste. It tastes as good as a motherf---. Shit don't do anything for me anymore, but I still do it." He's made good headway on his Redpop, and his relaxed vibe reflects it—the effects include numbness, lethargy, and euphoria.

In the parking lot out front, on West Fuqua Street in the South Park neighborhood of Houston, someone is tossing chicken legs, boudin sausage, and rib slabs on a grill. This isn't just any Wednesday afternoon on the South Side: It's the 16th anniversary of the death of Robert Earl Davis Jr., better known as DJ Screw, the main popularizer of "chopped and screwed," the technique that helped put the Houston hip-hop scene on the map. Davis would slow down the tempo of a song to make it seem as if the music were unfolding in slow motion, layering in new beats and scratches. He died in November 2000 of a "codeine overdose with mixed drug intoxication," according to the autopsy report, just as the styles he helped pioneer were becoming synonymous with the slower pace of Southern cities. To many, the music spoke of everyday life, which for some people included drinking drank. Artists such as Lil Wayne and Justin Bieber have since celebrated its high, spreading its fame and boosting recreational consumption.

The rising visibility of promethazine codeine syrup also made

the pharmaceutical companies that manufacture and sell it part of some communities' everyday vernacular. Users and dealers might not know how these companies did last quarter, but they all have opinions on who puts out the sweetest, most potent sip. "Right now, these motherf---s drinking anything. They got green shit, yellow shit, red shit," Gibbs says. "But most people are drinking the Hi-Tech red, Wockhardt green, and Qualitest. Those are the choices you have right now."

Bottles of promethazine codeine cough syrup produced by Hi-Tech Pharmaceuticals Inc. and Wockhardt Ltd. subsidiary Morton Grove Pharmaceuticals Inc. sell on the streets of Houston for \$750 to \$1,000 a pint, say the users, dealers, and experts who were interviewed for this story. If you have some extra scratch, there's syrup from Actavis (now Allergan Plc), the king of the market until the company stopped selling the product in 2014.

As recently as nine months ago, the remaining pints of Actavis syrup could fetch anywhere from \$2,500 to \$3,000, says Ronald Peters,

a retired professor of behavioral sciences at the University of Texas Health Science Center in Houston.

"It's the caviar of drugs," says Peters, who's been researching the cultural influence of cough syrup since the mid-1990s.

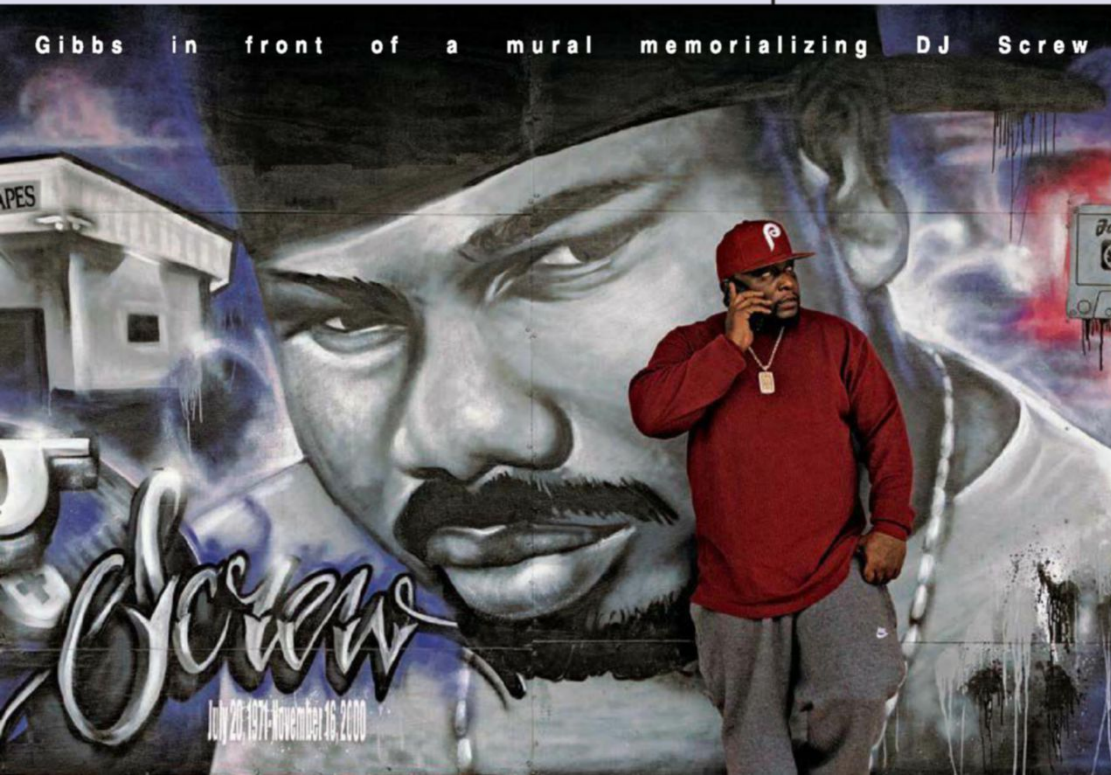
"If you have Actavis or Hi-Tech, those are like the Michael Jordan of sipping drank," says a user who will identify himself only as Scooby. The taste is distinctive, he adds: "The syrup could have been named the Magic Potion Bottle, and I would have known which pharmaceutical companies were making money." Scooby, who says he's 33 and unemployed, started sipping when he was 15 and still does on occasion. "It was embedded into our head to sip drank," he says. He recalls that friends

and neighbors would sit around a local swimming pool, holding Styrofoam cups.

In 2016 promethazine codeine syrup was prescribed about 4 million times in the U.S., according to data compiled by Bloomberg Intelligence, and brought in \$15 million in sales—a slight decline from when Actavis was on the market. These figures are curiously small relative to the syrup's cultural influence, but enough reaches the illegal market to keep it in the public eye. Last year, according to the *Atlanta Journal-Constitution*, investigators in Georgia found that technicians at Emory University Hospital Midtown in Atlanta had diverted 110 gallons of promethazine codeine to the

*If you have those are of sipping*

Gibbs in front of a mural memorializing DJ Screw





street from 2008 to 2013, leading to a \$200,000 fine. (The hospital told the newspaper it had systems in place to prevent such thefts, which it had strengthened in the wake of the revelations.)

It's difficult to know how big the illegal market is or how many of the estimated 2.1 million Americans addicted to prescription opioids are abusing promethazine codeine. The quality of addiction and overdose statistics varies from state to state, and measuring codeine abuse has been a lower priority than monitoring opioids such as oxycodone, hydrocodone, methadone, and fentanyl, whose use has exploded in recent years. But in 2011, the most recent year for which data are available, codeine (in all forms) was the reported cause of 11,000 U.S. emergency room visits, according to the Department of Health and Human Services. A 2013 study of more than 2,300 college students in the Southeast found that at least 6.5 percent had taken drank. That same year the U.S. government's National Institute on Drug Abuse said promethazine codeine cough syrup had become "increasingly popular among youth in several areas of the country."

In the two decades since promethazine codeine was first reported as a substance abuse trend, pharmaceutical companies have rarely acknowledged, let alone taken steps to combat,

like Actavis or Hi-Tech, Jordan  
 "drank," Michael

the illegal market. By contrast the companies most closely associated with the broader opioid epidemic have occasionally been called to account for their practices and have defended themselves publicly. For example, the maker of OxyContin, Purdue Pharma LP, in 2007 pleaded guilty to charges of misleading regulators, doctors, and the public about the addiction risks of its product; Purdue has since said that it reformulated the drug to give it "abuse-deterrent properties" and that it's funding programs to help prevent pharmacy robberies.

Despite drank's currency in pop culture, the syrup companies have largely managed to avoid such controversy, leaving experts and users to speculate on whether they regard the illicit market as a problem or an opportunity. "There ain't no difference between what happens with these pharmaceutical companies and what happens with McDonald's," Gibbs says.

Promethazine codeine cough syrup began its rise in 1952, when a company called Ani Pharmaceuticals applied to the Food and Drug Administration for approval of what was originally known as "Phenergan expectorant with codeine." The formulation paired promethazine, an antihistamine developed in France in the 1940s, with a painkiller that had been in use for more than a century. After a winding regulatory path, promethazine codeine was declared safe and effective by the FDA in 1984.

Dr. David Corry, chief of the Immunology, Allergy, and Rheumatology section at Baylor College of Medicine in Houston, says the idea is to block with one drug the major symptoms of allergies. "The codeine covers the cough; the promethazine covers everything else." The problem with the combination, he



adds, is the severe side effects, which include "altered mental status."

Drank has been around almost as long as promethazine codeine. In the 1960s, according to author Lance Scott Walker, who's written two books on Houston's hip-hop culture, the city's blues musicians began experimenting with a mixture of cough syrup and beer. After the FDA declared promethazine with codeine effective, users had a buffet of choices. Actavis was the first company to get a formulation on the market, labeling it Prometh With Codeine Cough Syrup. Wockhardt

followed not long after with Promethazine Hydrochloride and Codeine Phosphate. By 2013 at least seven pharmaceutical companies—Actavis and Wockhardt, plus Pharmaceutical Associates (now defunct), Hi-Tech (now owned by Akorn Pharmaceuticals), Nostrum Laboratories, Tris Pharma, and Amneal had received approval for at least 27 different promethazine codeine products, according to FDA records.

The first company to market was also the first to recognize publicly that some people were using its product recreationally. Over the years, Actavis's Prometh With Codeine formulation and its distinctive orange-and-white label had remained largely unchanged, and the liquid became the "purple standard" on the streets. Or the pink standard, rather: It was known, as the hip-hop artist 2 Chainz pointed out in a 2016 interview with WorldstarHipHop, for turning pink when mixed.

As Actavis was gaining in popularity, artists of varying degrees of celebrity were name-checking it or being otherwise associated with it—most crucially, 2 Chainz said, Bieber, the megafamous Canadian pop star. In early 2014, *TMZ* had published multiple anonymously sourced reports on Bieber's alleged drank abuse, including one saying that he was a "fan of Actavis prometh with codeine cough syrup." (Bieber has never responded to the allegations, although *TMZ* later reported that people close to him said he'd stopped sipping. A representative for Bieber didn't reply to a request for comment.)

That spring, Actavis pulled the product altogether. "Actavis has made the bold and unprecedented decision to cease all production and sales of its Promethazine Codeine product," a company official told *TMZ*, adding that the attention "has glamorized the unlawful and dangerous use of the product, which is contrary to its approved indication." Asked to comment further, an executive with Allergan directed *Bloomberg*

*Businessweek* to Teva Pharmaceutical Industries Ltd., which purchased Allergan's generics business last August. A Teva representative said the company was "unable to comment on the historic products as it relates to decisions of the legacy Actavis."

In August 2015, Wockhardt became the second company to publicly address the issue of recreational use of promethazine codeine syrup, following a controversy related to a syrup put out by its subsidiary Morton Grove. Three days after the *Chicago Tribune* published an article highlighting how the local suburb of Morton Grove, where the subsidiary is based, had become synonymous on social media with purple drank, Wockhardt issued a statement about what it called the "disturbing practice" of unapproved use of its syrup. "While some may attempt to glamorize it, prescription drug abuse is a public health problem," the company said. "We will continue to work with law enforcement and others to deter the unauthorized use of prescription cough medicine."

The acknowledgment that the syrup was being used recreationally was something, but to date, Wockhardt, which didn't respond to multiple requests for comment, doesn't appear to have taken any public steps to prevent abuse. And with Actavis out of the picture, the users and experts interviewed for this article say, Morton Grove and Hi-Tech gained market share.

Peters says that, based on his research with users, dealers, and pharmacists, Hi-Tech's Promethazine HCl and Codeine Phosphate Syrup CV was likely the highest-selling promethazine codeine product on the streets of Houston in 2015. That same year, Hi-Tech's parent company, Akorn, an Illinois-based generics manufacturer, introduced a second promethazine codeine formulation with the unwieldy name of Promethazine Hydrochloride, Phenylephrine Hydrochloride and Codeine Phosphate Syrup CV.

As yet, Akorn hasn't publicly acknowledged off-book use of its promethazine codeine cough syrups. But

Peters says he believes the

"To me, these were a lot of people who knew they were making a lot of money on the syrup"

company tacitly recognized their street value last year, by changing its packaging from plastic bottles to glass ones, which he says results in a more bitter-tasting syrup. (Akorn didn't respond to requests to address the assertion.) He adds that the street value for Hi-Tech has dipped slightly since the change in bottles, but that "it's still really wanted and one of the biggest sellers on the street market."

Peters developed his expertise during

the 1990s, when he researched drank and hip-hop culture while getting his doctorate in health promotion research and development. He went from high school to high school, witnessing kids share Sprite bottles full of drank and sometimes pass out in class. That led him to investigate the companies that produced and sold the syrup. He noticed a pattern of financial success that moved from one company to the next, as brands changed hands and public attention to drank increased. Actavis, he says, "passed the baton to the next company."

He says he believes that, with the packaging shift, Akorn might have been showing genuine concern about the recreational market. "To me, these were some ethical people who knew they were making a lot of money on the syrup," Peters says. David Ferguson, a professor of medicinal chemistry at the University of Minnesota who studies the pharmacology of widely abused drugs, takes a more skeptical view. "If people believe these companies are fighting the good fight to remove or end diversion or the illegal trafficking and sales on these products, I think they would be naive," he says. "These are big markets."

Calls and emails to other promethazine codeine syrup manufacturers, in addition to Akorn and Wockhardt, weren't returned. An exception was Endo, the parent company for Par Pharmaceutical, which sells Qualitest's promethazine codeine product, another popular syrup. "[P]atient safety is a top priority for Endo and we are committed to providing patients with approved products that are safe and effective," wrote Heather Zoumas Lubeski, a senior director for corporate affairs. "While it is not among our company's leading products, promethazine with codeine remains a viable treatment option for physicians and patients when used as prescribed."

Dr. Corry, of Baylor College of Medicine, questions whether promethazine codeine should still be an option. "There are more effective options around today that have greatly reduced side effects," he says. "Usually, the ultimate use for promethazine codeine will be recreational. There really is no medical use for this kind of combination." He adds: "I would be in favor of the FDA looking at banning it."

The FDA has been scrutinizing codeine anew since 2013—requiring, for

example, that warnings be added to labels highlighting the risks to children—but it has yet to publicly

A Select Drankography



"You can find me on them Screw CDs talkin' about 'Purple Stuff' Purple stuff! (Purrr-pullll) Purple stuff"

Purple Stuff —Big Moe (of Screwed Up Click)



"Mama leave 'em with a trace of Mo-E / And promethazine and yeah the codeine fiend"

Me and My Drank —Lil Wayne



"Forty dollars for just one ounce, plus / Tussionex is how it's pronounced"

Sippin' On Some Syrup —Three 6 Mafia



tackle the dangers connected to recreational use of promethazine codeine syrups. “The FDA’s actions in this area are based on the latest safety data available,” Sarah Peddicord, a press officer for the agency, wrote in an email. “The agency is currently evaluating all available information to determine whether additional communication and/or regulatory action is needed.”

On the enforcement side of the equation, promethazine codeine has been overshadowed by other prescription opioids. Doug Coleman, special agent in charge of the Drug Enforcement Agency in Arizona, worked cases related to promethazine codeine in predominantly black neighborhoods throughout the U.S. for a year around 2003, tracking the manufacturing and prescriptions that would go out for the syrup. He says the DEA focuses on larger-scale investigations involving organizations or “dirty doctors.” “If it gets down to the street level, where let’s say somebody takes a couple bottles of this product and they’re distributing around the lower levels, then we really don’t get around to it so much,” he says.



station, without hearing at least one reference to syrup. As Screwed Up Click’s popularity was on the rise in the late ’90s, Randy’s dependence grew into addiction. He was in jail for possession of codeine in 2000 when his best friend and co-pioneer, DJ Screw, died. When Randy was released after a three-year stint, he says, he sobered up and began learning about the effects of abuse on the brain and kidneys. “As long as promethazine codeine stays in the hip-hop, impoverished, and less fortunate communities, it’s not going to be addressed by these companies,” he says.

Scooby, the unemployed user, says that after spending a fortune over the years, he’s weaned himself to the point that he rarely sips. He expresses skepticism about the companies but says he hopes they might publicly recognize the drug’s effects: “People need to sway them that what goes on here is legit. I don’t think they want to hear people like me.”

Outside Screwed Up Records, a few people get out of a car to snap photos of the mural of DJ Screw. Inside, Gibbs takes a sip from his white cup. Sitting back in his chair, he offers no indication that he’ll slow down on drank, despite his protestations that he’s essentially immune to the buzz. Far from hoping the companies will stem the flow of syrup into poor communities, he says they should acknowledge the role that he and others in hip-hop have played for their products. “I feel like they should break off a check or at least drop off a couple of cases,” he says, laughing through the smoke from his Black & Mild. “We’ll keep it confidential.” **B**

**I**n the summer of 1992, DJ Lil Randy was riding around Houston in the back of a friend’s car when he was handed a bottle of Boone’s Farm wine. Inside was promethazine codeine cough syrup. He loved the taste, which he compares to fruit punch. “We weren’t really mindful about the drug part of it at first,” he says. “It was strictly the taste that got us. After that, it kinda became an everyday thing.” He pauses, lowering his head for a moment before continuing. “If I had known then what I know now, I don’t think there’s any way I would be talking about it on a mixtape,” he tells me. Drinking syrup, he says, “went from a fad to a population to a community.”

*ethical marketing*

There was a time when it seemed as if you couldn’t listen to a track from a Houston hip-hop artist, DJ Lil Randy included, on a mixtape or on 97.9 The Box, the city’s premier hip-hop radio



“Two cups of the muddy, I swerve on ‘em / Actavis, Actavis wait on it / Actavis, Actavis wait on it”

*I Don’t Play About My Paper*  
—DJ Khaleed



“Dibble dabble with the lean / Hi-Tech with the cream soda / As I whipped the yola / Lambo red, Coca Cola”

*Yamborghini High*  
—ASAP Mob



“You know, I’m on one / Two white cups and I got that drink, it could be purple, it could be pink”

*Trust Issues*  
—Justin Bieber, covering Drake

# "BOB WAS COVERING THE STORY AND ALL OF A SUDDEN HE WAS THE STORY"

- LEE WOODRUFF, AUTHOR, JOURNALIST AND WIFE OF ABC NEWS ANCHOR BOB WOODRUFF



After Lee's husband was involved in a roadside bomb explosion while covering the war in Iraq, their lives changed forever. Their shared experience of Bob's traumatic brain injury, treatment and recovery gave them a deeper understanding of how important it is to return to a community that's ready to help.

The Bob Woodruff Foundation invests in positive returns for our wounded veterans who are no longer fighting on battlefields, but fighting to reintegrate into their communities, lead purposeful lives, and find ways to make a difference again. By navigating over 46,000 nonprofits providing service to veterans, this foundation makes connections between community and hero—creating a connection that perpetuates a cycle of positive returns for service members, their families and contributors alike.

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THIS COFFEE MAKER WON'T  
**QUIT**

**IN DEFENSE OF LAGUARDIA**

**JUMP**  
INTO A JUMPSUIT

**SPORTS EXECS' BIG**  
**SCORES**

# Welcome To New York!

It's 2140 and the city is underwater, but  
in sci-fi writer Kim Stanley Robinson's  
imagination, you can still catch a cab

By Aaron Rutkoff  
Illustrations by Yann Kebbi





Science fiction writer Kim Stanley Robinson, 64, a self-described suburban guy and househusband, lives with his scientist wife and two adult sons in a decidedly unfuturistic split-level home in Davis, Calif. He writes his novels at a round metal table in the front yard, shaded by tarps and accompanied by the soft sounds of wind chimes and, occasionally, jazz or classic rock playing on a weathered-looking boombox. From there it's a short walk to the garden, where Robinson tends to beans, cabbage, and broccoli. "It teaches you that we don't have crops fully whipped," he says, adding that everyone should try growing plants as a lesson in mortality: "It's spooky. They die."

Robinson's neighbors are largely professors, lawyers, and environmental activists. His subdivision, a post-hippie-era place called Village Homes, has a community-run day-care center, collectively owned orchards, and a tradition of potlucks. Most residences have solar panels on the roofs. These details, rather than zombies ("I hate that stuff, it's so easy," he says) or aliens ("I don't quite believe in those"), creep into his books. In fact, in three decades, Robinson has stuck to penning stories about scientists, not swashbuckling space pirates—though he did set a recent book on an interstellar spaceship. He wanted to argue that we should see ourselves not as a universe-colonizing master race but as an isolated civilization permanently marooned in our little solar system.

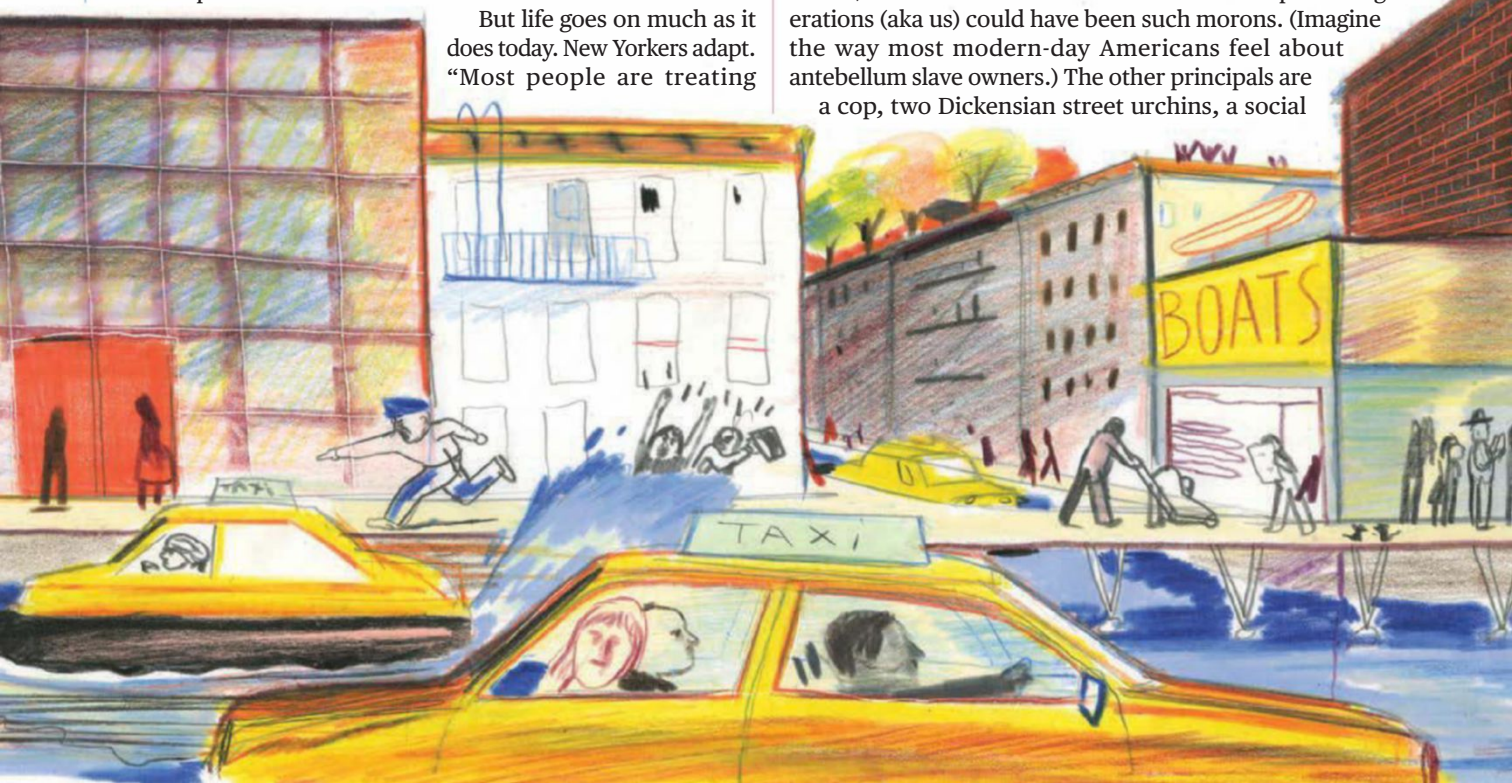
His 18th novel, due out on March 14, bases its plot on something more typically down-to-earth: New York real estate. In *New York 2140*, unstoppable glacial melt has caused a 50-foot rise in global sea levels, flooding the city. Everything below Midtown has become a tidal zone where menacing green waters flow around the ground floors of skyscrapers. Wall Streeters commute to work by boat; the super rich live on high ground, above 125th Street; and speculators have started moving in on downtown, an underwater Bohemia where artists and middle-class strivers struggle to get by. A winter freeze locks the city in ice. And, spoiler alert, billions of gallons of standing water don't help with the smell in summer.

But life goes on much as it does today. New Yorkers adapt. "Most people are treating

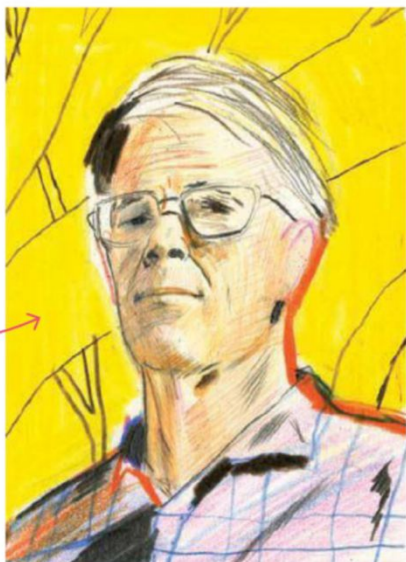
climate change as the disaster that is going to end civilization," says Gerry Canavan, an English professor at Marquette University who co-edited a book of essays on ecology and sci-fi with Robinson. By contrast, he says, Robinson shows a "process of improvisation and innovation that will allow us to continue living." People living their lives, only wetter, may not produce the same vicarious thrills as more dystopian visions—John Carpenter's 1981 film *Escape From New York* imagined the city in 1997 as a walled maximum-security prison—but books such as *2140* feel more relevant and essential as startling reports of climate change mount. The year 2140 isn't exactly around the corner, but we did just have the hottest year on record. How far off will rowing to work seem even in 2040?

Climate change has long been Robinson's preoccupation. His *Science in the Capital* trilogy, whose first installment was published in 2004, stars National Science Foundation employees who, having failed to stem the consequences of global warming, launch "terraforming" projects, pumping melted glacial ice into the Sahara and trying to restart a stalled Gulf Stream. His *2312*, published 300 years before the title date, predicted that we'd figure out how to live on Mercury and the moons of Jupiter but not how to prevent our planet from becoming too hot. Stephanie LeMenager, a professor at the University of Oregon who studies climate change fiction, recommends 1992's *Red Mars*, the first book in a trilogy by the same name, which explores that planet's colonization. Robinson "tends to be a utopianist," she says, explaining that he's "a person who finds solutions in the most wicked problems—problems that would seem unsolvable."

The utopian streak running through *2140* has its roots in what would seem a particularly intractable problem. Robinson believes that the free-market financial system, the cause of a great deal of ruin in recent years, could yet become something better. The novel is part detective yarn, part treasure hunt, part real estate speculation scheme. To tell its backstory, he casts a nameless character known only as "the citizen"—a cynical, profane (aka classic) New Yorker who can't understand how previous generations (aka us) could have been such morons. (Imagine the way most modern-day Americans feel about antebellum slave owners.) The other principals are a cop, two Dickensian street urchins, a social







worker, a reality television star, a building superintendent, a pair of low-level hedge fund quants, and a star hedge fund trader.

The citizen tells us that most of the flooding occurred in two “pulses.” “The First Pulse was a first-order catastrophe, and it got people’s attentions and changes were made, sure,” he says. “People stopped burning carbon much faster than they thought they could before the First Pulse. They closed that

barn door the very second the horses had gotten out. The four horses, to be exact.” The Second Pulse resulted from icebergs “the size of major nations” that broke loose and melted. Then the obvious thing happened. “Lawsuits proliferated,” the citizen says. “Many concerned the status of this drowned land, which it had to be admitted was now actually, even perhaps technically, meaning legally, the shallows of the ocean, such that possibly the laws defining and regulating it were not the same as they had been when the areas in question were actual land.”

Robinson’s baseline scenario might be too aggressive. Benjamin Strauss, vice president for sea level and climate impacts at Climate Central, a nonpartisan, nonprofit environmental group, says a 15-foot rise, not a 50-foot one, is more likely by

2140. That would still

mean standing water in Manhattan’s Lower East Side, Chelsea, and the Financial District. John F. Kennedy International and LaGuardia airports would be submerged. At 50 feet, Strauss says, “you certainly would have enough water for Venice,” but he’s more optimistic that the city will prevent flooding than is Robinson. “The geography of the area allows the building of a barrier,” Strauss says. “My guess is that we will build a wall and sit tight” before the water reaches Times Square.

2140 arose from Robinson’s conviction that the free market sets prices incorrectly. “The system set up now is a system of laws, and it’s an artificial system,” he says. “The laws could be rewritten to prioritize the survival of the species.” That’s what the book’s hero, the star trader, Franklin, winds up doing. Franklin was originally going to be a “thoughtless jerk,” Robinson says, but he was written instead as a sympathetic geek who tries to save the world “just out of his own self-interest.”

From the Met Life Tower in the Flatiron District, which Robinson picked after learning it was a clone of the Campanile di San Marco in Venice, Franklin rewrites the economic rules. He invents the Intertidal Property Pricing Index (IPPI), a post-flood version of the S&P/Case-Shiller Home Price Indexes; where the latter measure the value of residential real estate in major U.S. cities, Robinson’s invention prices the global market for all that new underwater property. (“It was obvious that we would have a lot of aquatic metaphors,” he says.) Since the majority of the planet’s most valuable real estate today is located in coastal areas, its ownership status would become highly uncertain were sea levels to rise. Robinson cites widespread common law dating to Roman times that establishes intertidal zones as beyond private ownership. “The unorganized public is a real legal concept,” he says. The IPPI, then, is a strange kind of optimism: Even after a climate apocalypse, capitalism can still find a way to put a price on things.

Currently, Robinson has a contract for two more novels—one will be about China taking over the moon—and he’s working on a nonfiction book about hiking in the Sierra Nevada. With the actual future and his imagined one slowly converging, he isn’t sure how much more sci-fi he has left in him. “I’m almost done,” he says. “I don’t want to repeat myself.” **B**

**At 50 feet, you  
“certainly would  
have enough  
water for Venice”**



# Jump Around

*Simplify your wardrobe with a humble onesie*  
By Shibon Kennedy



### Pack a picnic

*Pinafore-style overalls are a more feminine take on the workwear staple.*

**Ulla Johnson Rosina overalls, \$380; ullajohnson.com**

A.P.C. sweatshirt, \$235; apc.fr.  
Charlotte Olympia sandals, \$455; charlotteolympia.com



### Hit the town

*Is there an easier way to get around than with a hands-free fanny pack?*

**M.Martin jumpsuit, \$525; mmartin.com**

Karen Walker sunglasses, \$365; nordstrom.com. Clare V. fanny pack, \$259; clarev.com. Jimmy Choo sandals, \$525; jimmychoo.com



### Take a power lunch

*Live a little! Get crazy and unzip an inch or two.*

**Nomia cropped jumpsuit, \$465; similar styles available at store.nomia-nyc.com**

Donni Charm scarf, \$50; donnicharm.com. Pearl Collective x Veronika Borchers bracelet, \$600; pearlcollective.com. Clare V. bag, \$495; clarev.com. Jimmy Choo sandals, \$675; jimmychoo.com





**Suit up for the office**

*Summery linen in beachy hues makes the workweek more bearable.*

**Steven Alan Big Sur jumpsuit, \$345, and Chore jacket, \$265; [stevenalan.com](http://stevenalan.com)**

Vita Fede bracelet, \$475; [vitafede.com](http://vitafede.com). Paul Andrew sandals, \$1,045; [paulandrew.com](http://paulandrew.com)



**Don't bother with a ball gown**

*Turn heads in comfy ivory silk instead.*

**Zero + Maria Cornejo Nola jumpsuit, \$1,095; [allorabylaura.com](http://allorabylaura.com)**

Aurate New York earrings, \$580; [aurateneewyork.com](http://aurateneewyork.com). Smith + Mara earrings, \$430; [smithandmara.com](http://smithandmara.com). Jimmy Choo shoes, \$750; [jimmychoo.com](http://jimmychoo.com)



**Go day to night**

*Trade a blazer for a pair of eye-catching heels to swing straight into cocktail hour.*

**Cos jumpsuit, \$150, and earrings, \$19; [costores.com](http://costores.com)**

IaM by Ileana Makri bracelet, \$225; [ileanamakri.com](http://ileanamakri.com). Alexis Bittar bracelet, \$175; [saksfifthavenue.com](http://saksfifthavenue.com). Jimmy Choo sandals, \$895; [jimmychoo.com](http://jimmychoo.com)

*Yeah, that's right. I'm wearing a jumpsuit.*

**Jump on it, guys!**

*Jumpsuits aren't standard-issue menswear...yet. Get ahead of the game.*

**1.61 jumpsuit, price on request; special order at [desk@161studio.com](mailto:desk@161studio.com)**

Kule shirt, \$130; [kule.com](http://kule.com). Warby Parker glasses, \$95; [warbyparker.com](http://warbyparker.com). Larsson & Jennings watch, \$315; similar styles available at [larssonandjennings.com](http://larssonandjennings.com). Hermès bag, \$5,300; similar styles available at [usa.hermes.com](http://usa.hermes.com). Jack Erwin shoes, \$175; [jackerwin.com](http://jackerwin.com)



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# I LOVE LAGUARDIA

Those who think it's the worst airport in the U.S. don't appreciate its one major advantage

By Claire Suddath

**L**aGuardia smells like a used car filled with old Cinnabon bags. It's New York's second-busiest airport (behind John F. Kennedy International), and yet there's no convenient way to get there by mass transit. The floors are scuffed. The carpets are stained. Some of the bathroom stalls don't have working locks. Just this month, a runway was struck by lightning, and brown water poured out of a ceiling. Each year it serves about 28 million people through a hodgepodge of terminals that seem to be perpetually under construction. During a 2015 speech about infrastructure, then-Vice President Joe Biden told a Philadelphia audience, "If I blindfolded you and took you to LaGuardia Airport in New York, you must think, I must be in some Third World country." People laughed. "I'm not joking," Biden said. People laughed some more. I don't know why, though. LaGuardia is my favorite airport.

I want one thing from an airport: to get me to my gate as quickly as possible. LaGuardia, dilapidated hellhole that it is,

is pretty good for this. "I can get to the airport 41 minutes before my flight and be fine. That's impossible at most big-city airports," says Brian Kelly, founder of the Points Guy website, which offers money- and time-saving air travel tips. Kelly's good fortune is a result of those terminals, which spread out fliers instead of funneling them through a central departure point.

Unfortunately, all this is changing. Last year, the Port Authority of New York and New Jersey, which owns the airport, began an estimated \$8 billion renovation that will tear down LaGuardia's terminals and replace them with a central hub. There's \$450 million earmarked to beef up public transportation access, which would be especially helpful right now: Traffic has been so awful since the renovation began—particularly when the weather is bad—that some travelers have gotten out of taxis in the middle of the highway because that's as close as they could get to the airport. Nothing, however, is being done to address LaGuardia's measly two

runways, the primary cause of flight delays so frequent that they helped lead Kelly to rate the airport America's worst in a list he compiled last November.

Instead, LaGuardia will get upscale shops and eateries for travelers to check out while they wait and wait. I guess this was inevitable: There's already a Korean barbecue truck at Los Angeles International and a bakery that makes sourdough in adorable animal shapes at San Francisco International. Most airports are owned by cities or municipal governments, and they're

rewarded financially by leasing gates to airlines and retail space to restaurants and stores. When airlines co-fund terminals, as Delta Inc. is doing at LaGuardia, they can reap some of the rental profit. Fancy terminals beget fancy retailers, who pay higher rent. It's hard to persuade Bulgari to move into an airport without locks on every bathroom stall.

In 2008, JetBlue Airways Corp. paid \$743 million for its swanky terminal at JFK, which includes what the *New York Times* described as a "rustic Italian trattoria" operated by a former chef at Del Posto, a top New York spot. But I don't want to eat at a rustic trattoria when I'm at the airport. I don't want to walk for 30 minutes while carrying two unnecessarily heavy carry-on bags (adding the weight to my checked luggage would cost \$150) past Thomas Pink and Swarovski stores, because Delta's new \$1.3 billion JFK terminal has been laid out in one straight, mile-long line. I don't want my airport to be, as London's Heathrow Terminal 2 architect Luis Vidal once described his \$4 billion renovation plan, "a gathering place." I don't want to gather. I want to fly somewhere and do my gathering there. Sparkly jewelry won't distract me from longer security lines and flight delays, no matter how hard the airline-airport industrial complex tries. **B**

**BULGARI,  
THOMAS PINK,  
SWAROVSKI.  
NO THANKS**





# What's Your One Shining moment?

Executives at a Bloomberg sports business summit recount their highs and lows—but mostly lows—as athletes. By Ira Boudway

“I went to high school in New York City and grew up a huge Knicks fan. We played in a basketball tournament at Madison Square Garden—a dream come true. I wanted to make a splash. I was 0 for 12 with 4 or 5 air balls and then just bricks.”

**Don Cornwell**  
Partner, PJT Partners Inc.

“About five years ago, I did the Loch Ness Marathon [in northern Scotland]. I'd done training runs where I'd run 22 miles and was like, 'I feel great.' But then, on the day of, I'm at 22 miles, and ugh. That was my first marathon—I did it in about 4 hours and 25 minutes. And then the last one I did was 4 hours and 5 minutes. I've learned never to invite my wife and kids to watch me at the end. My kids were going, 'We must have missed him.' Because I said I would do it in three-and-a-half hours.”

**Nigel Eccles**  
Chief executive officer, FanDuel Inc.

“I played high school football in Washington, Conn. As an offensive guard, you don't get a lot of chances to touch the football. But once, when I was on the punt return team, I scooped up a blocked kick and ran it all of 2 yards without getting caught from behind. That was my only touchdown.”

**Mark Lazarus**  
Chairman, NBC Broadcasting & Sports

“My senior year at Dartmouth, where I played goalie in soccer, we won the Ivy League title and qualified for the NCAA tournament. We made it to the final eight and played against Rutgers. On their corner kick, instead of trying to punch the ball away, I tried to catch it. It knocked on someone's head, fell at their feet, and they knocked it in. We lost 1-0. Four days later, when the final four was taking place in California, I was sitting in Hanover, N.H., taking a final exam.”

**Gregg Lemkau**  
Co-head of global mergers & acquisitions,  
Goldman Sachs Group Inc.

“I was a point guard at Harvard. In 1997 we were the first team to go undefeated in the Ivy League. We played against the University of North Carolina in the NCAA tournament. Marion Jones, the track and field star, was their point guard. The coaches had three people on me in practice to try to emulate what it would be like with her guarding me.

It wasn't even close.”

**Jessica Gelman**  
CEO, Kraft Analytics Group



# STRANGE BREW

*This thing doesn't make cortados. By Gordy Megroz*

You can enjoy a pretty decent cup of coffee with Coffeeboxx's line of pods. The brew has a bold, rich taste without the watery consistency you get with a lot of single-serve coffee makers.



74

**A** promotional video for the Coffeeboxx shows it being thoroughly abused: It rattles around the bed of a pickup, falls victim to a shower of steel parts, is placed under a Jeep—and, finally, gets blown 20 feet into the air with explosives before returning to earth in one piece. “Made beyond rugged to deliver in the harshest environments,” the narrator says. “Built for those who bring it.” But who needs to bring it to a blast zone?

Thousands of people, apparently. In December, 4,500 Coffeeboxxes were sold, quadruple the number in any month since the product was introduced in April 2015. “It didn’t take long before customers were raving,” says

Robert Wilburn, online associate merchant for Home Depot Inc., which sells the machines for \$200.

Inventor Jim Doan, 41, began thinking about a durable coffee maker in 2007, during a building boom in his St. Joseph, Mich., neighborhood. “Every job site had a microwave and several coffee makers. And they were all destroyed,” he says. Doan, then a designer for Whirlpool Corp., began tinkering with ideas for a coffee maker that could withstand the demands of a construction site.

After 30 prototypes, he settled on one in 2014. He ran a Kickstarter campaign that ultimately let him buy a \$350,000, 10-ton mold to shape a plastic chassis. The frame is wrapped with more plastic and steel, and the seams are sealed with

silicone, making the 12-pound box dust-proof. A cup of joe brews in just under two minutes using water from a 2.5-liter tank, a retractable 3-foot power cord, and a single-serve pod.

The industrial-grade engineering has helped attract service members, firefighters, campers, and hunters—the same groups who helped Yeti Coolers LLC, the Austin-based cooler manufacturer, become a \$500 million company. Doan thinks OXX Inc., Coffeeboxx’s parent company, can reach \$100 million in sales in seven years by building out the “rugged appliance category.” He’s referring to microwaves, icemakers, and refrigerators, the last of which, presumably, has to be called the Chillboxx. **E**



**What is *Seeing You*, and what's your job?**

It's an immersive production from Ryan Hefington, the choreographer for the Netflix show *The OA*, and Randy Weiner, the producer of the theatrical experiences *Sleep No More* and *Queen of the Night*. It opens this spring. I handle logistics—I collaborate with performers on photo shoots, conceptualize virtual-reality experiences, etc.

**That's a lot of different responsibilities. How do you dress for them all?**

I have a pretty standard uniform. I don't like anything to clash with my skull tattoo, so I keep it a basic black.

**What's the story behind the tattoo?**

It's on the right side of my head. It's a lion and a rose, with a tiny Star of David inside one of the rose leaves. I got it when I was 18 and wasn't sure how a tattoo would play with my parents. I figured if I got it on my skull, I could grow my hair out if they were unhappy with it.

**Were they?**

No, they love it.

**Is that a shirt under your sweater? A dress?**

It's a superlong shirt. If I go out for a night on the town, I can take off the sweater and have a new look.

ZARA

**Those are high-waisted jeans.**

Yes. I like high-waisted everything. I never got into that Britney Spears low-rider look.

They work well with your shoes. I love small, unique details. The back of each shoe has a bold zipper that goes all the way down.

ZARA

**Do you always wear red lipstick?**

I do at night! It's my secret weapon.

SHOSHANA FISHER

28, director of marketing and partnerships, *Seeing You*, New York

ALEXANDER WANG

OFFICINE CREATIVE





# DANIELLE BROWN

Chief diversity and inclusion officer, Intel



1996

"I was valedictorian—but there were only 58 people in my class, so, you know."

### Education

- Our Lady of the Lakes Catholic School, Waterford Township, Mich., class of 1996
- Michigan State University, East Lansing, Mich., class of 1999
- Stephen M. Ross School of Business, University of Michigan, Ann Arbor, class of 2008



With her grandmother at business school graduation, 2008



### Work Experience

- 1999-01**  
Consultant, mergers-and-acquisitions risk services, PricewaterhouseCoopers
- 2001-03**  
Senior financial analyst, Abbott Laboratories
- 2003-07**  
Sales rep, health systems manager, TAP Pharmaceutical Products
- 2007-09**  
Institutional sales manager, Gilead Sciences
- 2009-13**  
Associate, Accelerated Leadership Program, director, Leader Communities and Programs, Intel Corp.
- 2013-14**  
Chief of staff for HR, Intel
- 2014-Present**  
Chief of staff to the chief executive officer, Intel
- 2015-Present**  
Chief diversity and inclusion officer, vice president for HR, Intel

"It was my first time working in field sales. It was the most fun job I ever had."

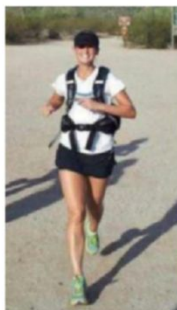


"Intel recruits 15 graduating MBAs from the top schools. At my interview, everybody was a genius, and I was like, 'It's nice that they invited me, I'll never hear from them again.' Then they offered me a job."



With her husband, Justin, in Lisbon, 2013

Running in Cave Creek, Ariz., 2012



"You're juggling a million things at once: a strategy presentation for the board, a staffing issue, an organizational announcement. It's just fascinating—two-and-a-half years later, and I'm still learning."

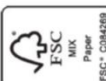
At Glamour's Women of the Year summit, 2016



### Life Lessons

1. "If a job doesn't make you think, Wow, I'm not really sure I can do it, it's not challenging enough." 2. "Hire people smarter than you. It's an honor and a pleasure when my team outshines me." 3. "Take the time to interview a diverse slate of candidates, and don't just rely on your own judgment—put together a diverse panel of interviewers to help you assess."

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My communications and collaboration  
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**PAUL CHAPMAN**  
Chief Information Officer, **box**

A portrait of Paul Chapman, Chief Information Officer at Box, is featured on the right side of the advertisement. He is a middle-aged man with a shaved head and a goatee, wearing a dark suit jacket over a white shirt. He is looking upwards and to the left with a thoughtful expression. The background is a bright, out-of-focus office setting. A blue network graphic with glowing nodes and connecting lines is overlaid on the bottom right of the image, partially covering Paul's jacket.

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