Bloomberg Businessweek Middle East
16-31 December, 2017

50 companies to watch in 2018

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Algeria DZD 215	Egypt EGP 18	Jordan JOD 2	Lebanon LBP 4000	Oman OMR 1	Saudi Arabia SAR 10	UAE AED 10
Bahrain BHD 1	Iraq IQD 3200	Kuwait KWD 0.75	Libya LYD 3.5	Qatar QR 10	Syria SYP 200	Yemen YER 600

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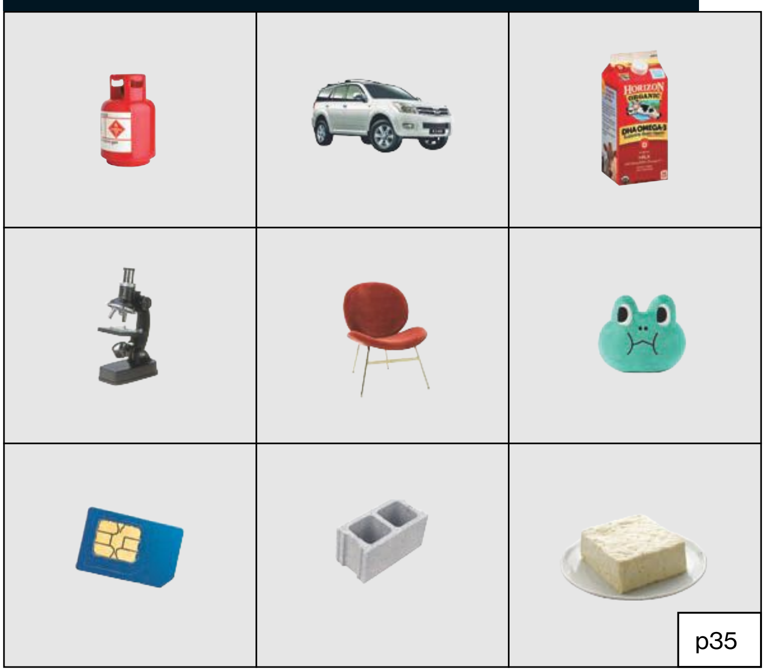
50 Companies to Watch



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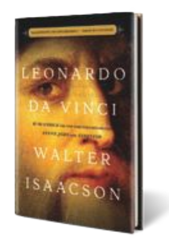

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VIEW

Delight in festal merriments under the starry darkness and witness Burj Khalifa's fireworks burst into Dubai's night sky while indulging in Jones the Grocer's gourmet selection, a connoisseur selection of drinks, and live duo performances.

Sit back, relax and enjoy a fiery spectacle like no other as you welcome 2018.

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IN BRIEF

Americas

● Meredith, the publisher of *Better Homes & Gardens*, agreed to buy Time Inc. for

$1.9b

in cash and shoulder the company's $2.8 billion in debt. The deal was financed with help from conservative billionaires Charles and David Koch, who invested $650 million.

● Mexico Minister of Finance José Antonio Meade resigned from office to seek the nomination of the ruling Institutional Revolutionary Party in next year's presidential elections.

● NBC fired longtime *Today Show* host Matt Lauer over sexual harassment allegations.

Lauer, who'd co-hosted the program for more than 20 years, didn't immediately issue a public statement.

● "I'm all for capitalism...but there is such a thing as too much."

Vanguard Group founder Jack Bogle, speaking out against plans to cut corporate taxes, called the bills under consideration a "moral abomination."

● A glitch in American Airlines' scheduling system allowed too many pilots to plan time off in December, leaving the carrier short for the holiday rush. It's offering pilots a 50 percent bonus on their normal hourly wage to cover flights.

● The U.S. Supreme Court turned away two appeals from firearms advocates. One case challenged Maryland's ban on assault rifles; the other pressed for open-carry rights in Florida.

● Within 24 hours, Bitcoin rocketed past $10,000 and $11,000, plunged more than

20%

and then continued to bounce around on Nov. 29.

● There were big changes at two struggling fast-casual chains: Arby's owner Roark Capital Group agreed to buy Buffalo Wild Wings for $2.4 billion, and Chipotle Mexican Grill founder Steve Ells announced he'd step down as CEO, which sent the burrito maker's stock up as much as 5.4 percent.

Europe

● Facebook and Twitter agreed to help the British government investigate Russian interference in the 2016 Brexit referendum.

● The head of Germany's Social Democratic Party, Martin Schulz, signalled he might be willing to enter into a coalition agreement with Chancellor Angela Merkel's Christian Democratic Union.

● Freight trains in Norway killed more than 110 reindeer during a four-day period. The animals' owners, who herd them to grazing areas every winter, are calling for speed limits and better fencing.

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● Former Bosnian Croat leader Slobodan Praljak ingested poison in court at a UN criminal tribunal in The Hague after being found guilty of war crimes. He was taken to a hospital, where he later died.

● Airbus tapped Eric Schulz, president of civil aerospace at Rolls-Royce Holdings, as sales chief. He replaces John Leahy, who held the job for 23 years.

● London Stock Exchange CEO Xavier Rolet stepped down on Nov. 29 at the request of the board. The move sets up a standoff between LSE and 5 percent stakeholder TCI Fund Management, which had defended Rolet.

Asia

● Two more Japanese manufacturers, Mitsubishi Cable Industries and Toray Industries, admitted to inflating quality data on materials used in car tires, cardigans, and other products.

● A consortium led by SoftBank Group sought to invest in Uber Technologies at a 32 percent discount to its most recent valuation,

$68.5b

The bid came as Uber reported a loss of $1.5 billion in the last quarter, wider than that of the preceding period.

● Thousands of tourists were trapped in Bali and more than 140,000 residents fled their homes as the Mount Agung volcano spewed a 2-mile-high cloud of ash.

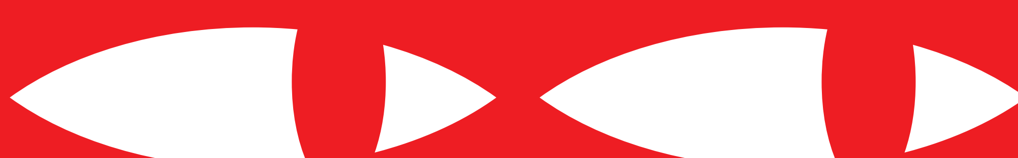
● On Nov. 28, North Korea fired its longest-range ballistic missile yet. In response, Hawaii reactivated a nuclear warning system that's been dormant since the Cold War.

Africa

● An Egyptian court sentenced 14 men to three years in prison for "abnormal sexual relations," among other things. They were arrested while waving rainbow flags at a concert.

● Uhuru Kenyatta was sworn in for his second term as president of Kenya following a long, litigious electoral process.

The Secret War Against Fake News



Is Too Secret

● Facebook, Google, and Twitter have to be more transparent about the way they work with data

● By Paul M. Barrett

Facebook, Google, and Twitter have a problem with harmful content. And the consequences of the twin online scourges of political disinformation and terrorist incitement have been on full display lately. During three congressional hearings in Washington, lawmakers and the rest of us learned that as many as 126 million Facebook users may have seen divisive content posted by Russians seeking to interfere with the 2016 election. Meanwhile, in New York, authorities said that an Uzbeki immigrant who killed eight people in a truck attack on Oct. 31 was radicalised online by videos produced by Daesh. Five days later, tweets amplified by Google News spread phony stories that the shooter in the Texas church massacre had been a supporter of Hillary Clinton and Senator Bernie Sanders.

These developments ought to provide a spur for the world's dominant search engine (Google) and its two leading social networks (Facebook and Twitter) to accept greater responsibility for addressing internet pollution. Senator Dianne Feinstein (D-Calif.) laid out the options during a Nov. 1 hearing before the Senate Intelligence Committee. Lecturing the three companies' general counsels, the California Democrat said: "You've created these platforms, and now they're being misused. And you have to be the ones to do something about it. Or we will."

It would be better for all concerned–the companies, their users, and society at large–if Google, Facebook, and Twitter heeded Feinstein's admonition and instituted serious reforms addressing the propaganda and violent imagery their platforms can be used to convey. They would preclude knotty free-speech arguments about government restrictions on content and save lawmakers from having to delve into technical realms where their expertise is thin. (A new dimension to the connection between Russia and U.S.-based social networks emerged on Nov. 5, when multiple media outlets reported that hundreds of millions of dollars in past investments in Facebook Inc. and Twitter Inc. came indirectly from Kremlin-controlled financial institutions.)

On the topic of deleterious online material, the best evidence that the internet companies can make meaningful progress comes from their own recent records of improving algorithms, providing better user warnings, and increasing human oversight of automated systems. As the New York University Stern Center for Business and Human Rights argues in a new report called "Harmful Content," the companies can–and should–do more.

Before going any further, let's stipulate that the odds of sweeping U.S. regulation in this area are minuscule. A Republican-controlled, business-friendly Congress isn't likely to go after two of the country's most successful companies–Google and Facebook–or even Twitter which, while less financially robust, is nevertheless a favourite outlet of the Tweeter-in-Chief.

The one area where Congress might act is political advertising. Senator John McCain (R-Ariz.) has co-sponsored a bipartisan bill that would make online election ads subject to the same disclosure requirements as conventional broadcast ads. At the recent hearings, the three companies' lawyers vowed to adopt voluntary rules similar to those in the McCain bill–a blatant and entirely healthy example of industry trying to get out in front of threatened legislation. If the companies had enforced rigorous transparency rules in 2016, they might have stymied Russian operatives' postings and tweets.

More broadly, the digital giants could prove their good faith and lessen misuse of their platforms if they opened up their corporate data operations–not, of course, the private data of customers–to outsiders. "It's difficult to impossible for researchers to see" what's going on within company systems, "and as a result, we don't know much, or we're guessing," says Alice Marwick, an assistant professor of communication at the University of North Carolina at Chapel Hill. "Only by ending the opacity and secrecy around social media will we fully understand what goes wrong," says Wael Ghonim, a former Google product manager and internet activist.

Radical transparency would clash with prevailing corporate instincts–and would have to be tempered by careful protection of user privacy–but it could open the industry to new ideas and win it new levels of trust. Twitter, for example, has said that some 36,000 Russian-controlled "bots" were tweeting during the 2016 campaign. But Senator Mark Warner (D-Va.) suggested during the Nov. 1 hearing that Twitter's tally of automated accounts was low. Warner cited independent estimates that up to 15 percent of all Twitter accounts–potentially 49 million–are controlled by software, not humans. More access to company data would presumably address Warner's scepticism and possibly help provide answers to what Twitter should do about all of those bots.

Asked about the transparency idea, a Twitter spokesperson pointed to a recent company report that said: "Twitter is committed to the open exchange of information."

Facebook, Google, and Twitter make money by selling users' attention to advertisers. The companies do most of their digital business via algorithms–the complex instructions that tell computers how to select and rank content. For all their subtlety, though, algorithms sometimes elevate clearly false information. Without pretending that algorithms can be perfected–they're human constructions, after all–it's not too much to expect the internet companies to improve them with maximum urgency.

Consider one recent example involving Google. In April the company said on an in-house blog that 0.25 percent of searches–meaning millions per day–had been "returning offensive or clearly misleading content." In one illustration in December 2016, the very first result for the search, "Did the Holocaust happen?" was a page from the neo-Nazi site Stormfront offering the "top 10 reasons why the Holocaust didn't happen." Alarmed by that and similar incidents, Google launched an algorithm scrubbing called Project Owl. In April, Google announced it had made false information "less likely to appear."

The company didn't provide a new rate for misleading content to compare with the 0.25 percent figure, but by one admittedly anecdotal measure, Project Owl seems to have had some effect. I Googled, "Did the Holocaust happen?" on Nov. 9. A site devoted to "combating Holocaust denial" led the results; Stormfront's opposite message didn't surface until the middle of the fourth page. The drive for more refined algorithms needs to be accelerated. A Google spokesperson said via email: "While ▶

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◀ we've made good progress, we recognise there's more to do."

In some markets, Facebook has been experimenting with a fact-checking function to keep its News Feed honest. Based on user reports and other signals, the company says it sends stories to third-party fact checkers such as PolitiFact. When they question a story, Facebook notifies users it has been "disputed" and discourages sharing. "We already do a lot when it comes to the security and safety of our community," a Facebook spokesperson said via email. Now the fact-checking program and others like it deserve to be expanded and imitated elsewhere.

When it comes to violent incitement, the search and social network companies face a whack-a-mole problem: They're continually taking down extremist videos, only to see copies reuploaded. In response, Facebook, Google's YouTube video site, and Twitter are experimenting with a technique called "hashing," which allows the companies to track the digital fingerprints of copied videos so they can be automatically removed. YouTube used hashing recently to take down tens of thousands of sermons by Anwar al-Awlaki, an American-born cleric notorious for terrorist recruiting who was killed in a U.S. drone strike in 2011.

In August, YouTube toughened its stance toward videos that contain inflammatory religious or supremacist content but do not qualify for removal. Such material now comes with a warning and isn't eligible for recommended status, likes, or comments. Borderline videos also are harder to find via search and can't have ads sold next to them.

In a related experiment, a Google affiliate has developed a tool called the Redirect Method that can detect a user's possible extremist sympathies based on their search words. Once it has identified such a person, the tool redirects them to videos that show terrorist brutality in an unflattering light. Over the course of a recent eight-week trial run, some 300,000 people watched videos suggested to them by the Redirect Method for a total of more than half a million minutes.

As these illustrations show, the digital platform companies are willing and able to improve, but they need to step up the pace, breadth, and intensity of their efforts. Facebook announced at the congressional hearings that by late 2018 it would double to 20,000 the number of employees and contractors working on "security and safety." Chief Executive Officer Mark Zuckerberg told investors on Nov. 1 such expenses would "impact our profitability."

That's easier for a CEO to say, of course, on a day when his company releases blockbuster results. For its third quarter, Facebook earned $4.7 billion, up 79 percent. "Protecting our community is more important than maximising our profits," Zuckerberg also said. But that's a false dichotomy. In the long run, the internet companies will retain users and advertisers only if they avoid being swamped by objectionable content. The path to profits points toward doing the right thing. Ⓑ

Barrett, a former Bloomberg Businessweek *writer, is deputy director of the NYU Stern Center for Business and Human Rights.*

■ VIEW

To read Mohamed El-Erian on what a middling Uber rating means and Timothy O'Brien on the real chaos in Puerto Rico, go to Bloombergview.com

One Year Too Many on Campus

● Three-year bachelor degrees could reduce debt for U.S. students

The basic cause of America's student-loan crisis is no mystery: College tuition and fees continue to soar while the earnings of recent graduates remain unchanged. It shouldn't be surprising that there's also a straightforward way to lower the cost of a college degree: Reduce the amount of time it takes to earn one.

The U.S. four-year bachelor's degree is based on cultural convention, not pedagogical wisdom. In most European countries, as well as India, Singapore, and Australia, most undergraduate programmes take three years to complete. Some U.S. colleges allow enterprising students to finish their requirements early, but that option is available only to those who enter college with sufficient credits from advanced courses taken in high school—and some elite schools are trying to limit even this practice.

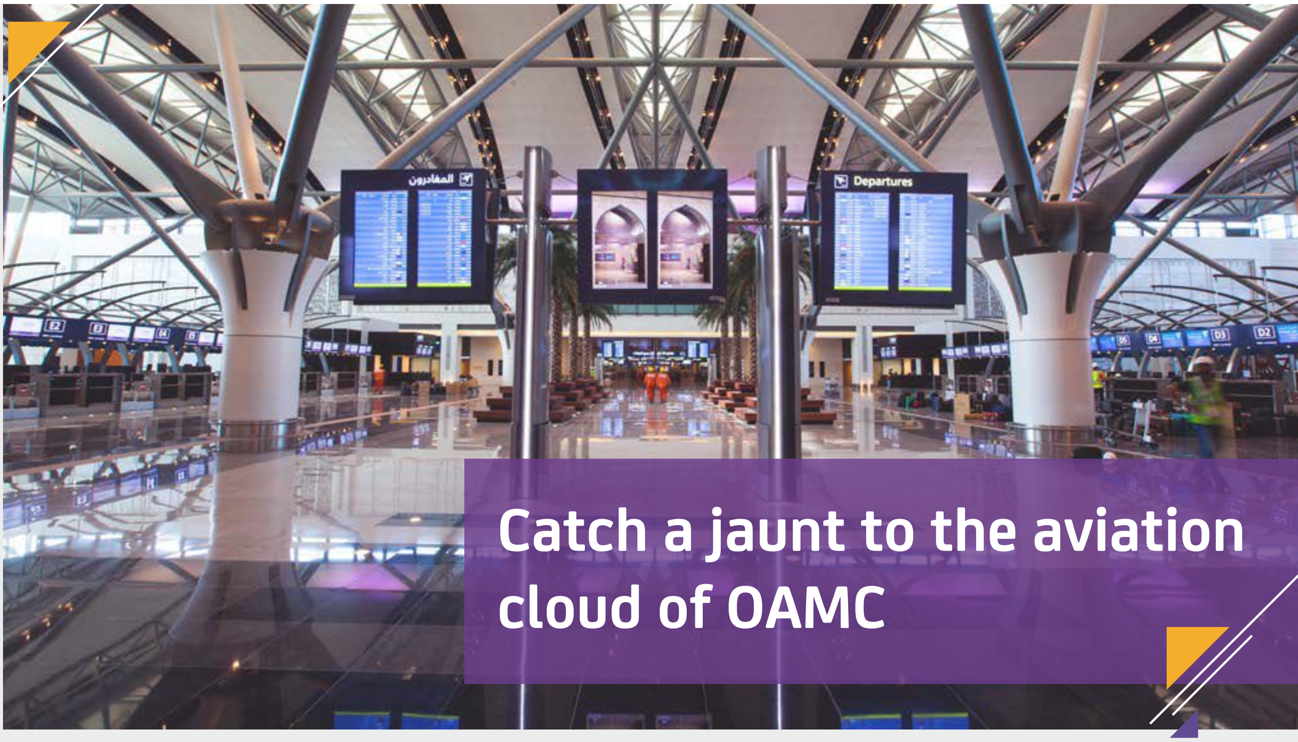
Defying industry inertia, a small number of U.S. schools have started to experiment with three-year degrees. This fall, Purdue University, a public school in Indiana that enrolls 31,000 undergraduates, announced that option is open to all incoming students pursuing liberal arts degrees. By carrying a slightly heavier course load and taking classes in the summer, students can complete the same number of credits required for a four-year degree. The university provides dedicated advisers to help three-year students structure their schedules. And they still have time to participate in abbreviated study abroad and internship programs.

The plan's principal beneficiaries are students, who will save $9,000 if they live in-state and $18,400 if not. Purdue says the discount is intended to stimulate demand, allowing the university to expand its student body and make up for the loss of tuition revenue. Increasing the number of students year-round also enables more efficient use of campus facilities.

It's not likely that other institutions will soon follow Purdue's example. With applications to the country's top four-year schools far surpassing the number of available spots, colleges have little incentive to provide a discounted option.

But getting a college education is more than just a commercial transaction. There's a public interest in making higher education more widely available to qualified students. Government's role may be limited, but it can be helpful: tying eligibility for state and federal student aid to offering a three-year option, for example.

Not everyone needs a traditional college education. As Secretary of Education Betsy DeVos says, the U.S. needs more pathways that allow Americans without one to reach (or remain in) the middle class. For those who want a college degree, obtaining one needn't take so long. A three-year degree is a simple, cost-effective way to set more students up for future success. Ⓑ



Catch a jaunt to the aviation cloud of OAMC

Oman Airports Management Company has introduced two new back-to-back projects with the opening of Salalah airport in late 2015 and the soon-to-be-opened New Muscat International airport. A third project in Duqm is about to commence its readiness program while the fourth project in Sohar is doing great in terms of the passenger growth while it's not officially opened yet. It is indeed a great achievement to have accomplished this much in such a short duration and this gives us great confidence as we move into 2018.

The Government of Oman has invested time, capital and energy in designing and incorporating four airports that don't just meet, but surpass, international standards and in turn display the beauty of Oman in the most creative manner possible. This has further led to Oman being recognized on the global map, attracting a greater number of tourists and businesses to the country. The management's aim was to bring the country to the attention of the world by showcasing its unique blend of modernity with the quintessential and beautiful aspects of Omani culture. The ambition is to be in the top 20 airports globally by 2020, portraying Oman as a country that dreams big, combined with a realistic assertiveness.

To have achieved what we have in a short space of time was not easy, but after years of hard work and dedication we have proved just what is possible with a clear vision combined with the positive mindset of a dedicated team focused on the task in hand. We as OAMC do not consider ourselves to be a firm that is purely target and profit oriented; we see our company as a firm that puts the country first by creating and promoting a positive impression in the minds of people of Oman and around the world.

In order to encourage more tourism and to help facilitate business in Oman, our strategy has been simple and straightforward: It includes building and modifying our airports in such a manner that creates a great first impression in the minds of passengers who enter our country. We believe that by showcasing our culture and heritage with modern views, diversity and adaptability we will encourage passengers to truly feel the essence of Oman, helping to give a sense of connectivity with the place.

To enhance the comfort of passengers, we have worked very closely with our strategic partners to allow easier and faster access to and from our airports. We have also ensured that our wide range of duty-free outlets, including both international brands and local markets, are displayed. These outlets offer our customers a wide selection of luxury goods and services. We have also incorporated an in-house airport hotel that will allow passengers to stay within the airport in case of flight delays or missed connections.

OAMC has always believed in achieving its goals without harming or disrupting anyone. Hence the reason why we have obtained accreditation under the Airport Carbon Accreditation scheme. Indeed, this showcases to the world that we fully understand our responsibility towards the environment and demonstrates that we are committed to implementing technology, processes and procedures that will help us to reduce our impact on the environment.

We've participated in the ACI program of carbon reduction through constant measurement of our carbon footprint, examined consumption of fuel and energy, increased our use of clean energy supplies and reduced our energy demand through automated meter reading (AMT), automated monitoring and targeting (AM&T). All of this also means that we are able to increase airport sustainability so as to welcome people into an environment that is cleaner, healthier and more serene.

We believe that we can deliver more value and incentives to our passengers by providing them with an experience that combines luxury and tradition. Our sole purpose has always been to provide the best for our customers without diverting from our core message of being "the gateway for beauty and opportunity". However, in today's world there are extreme levels of competition and novel inventions in various fields, which makes it arduous to match these standards and at the same time meet customer expectations, which only increase.

As we move into 2018 we are determined to continue on a path of constant improvement and we promise our customers and others around the world that we will perform to the best of our ability and work hard to position Oman Airports as one of the top 20 Airports in the world by 2020.

AFP

Louvre Abu Dhabi gets Salvator Mundi

● Abu Dhabi acquires Leonardo Da Vinci masterpiece, setting off conflicting rumours over work's owner

The Louvre Abu Dhabi is getting Leonardo Da Vinci's "Salvator Mundi," which sold in November at a Christie's auction for $450 million, the most ever paid for a work of art.

Christie's confirmed Dec. 10 that the Abu Dhabi Department of Culture and Tourism had acquired the masterpiece and that it would be displayed at the Louvre Abu Dhabi.

The statement came amid conflicting rumours about the buyer of the work. The confusing saga started on Dec. 6 when the Louvre Abu Dhabi tweeted that it was getting the most expensive painting in the world. The news was quickly followed by a New York Times story identifying Saudi Prince Bader bin Abdullah bin Mohammed bin Farhan al Saud as the buyer, citing documents it reviewed.

The following day, the Wall Street Journal reported that Saudi Arabia's Crown Prince Mohammed bin Salman was the true buyer, citing a source in the U.S. government intelligence community and a Saudi art-world figure familiar with the purchase.

The crown prince has been silent on the matter. But on Dec. 10 December, Saudi Arabia's embassy weighed in. In response to media reports about the sale, the embassy said it contacted the office of Prince Bader, which confirmed the artwork was "acquired" by the Abu Dhabi culture department.

The inquiry revealed that Prince Bader "as a friendly supporter of the Louvre Abu Dhabi, attended its opening ceremony on November 8th and was subsequently asked by the Abu Dhabi Department of Culture and Tourism to act as an intermediary purchaser for the piece," according to the statement.

Ever since the sale at Christie's, the identity of the buyer has been the most sought-after secret in the art world and beyond. Buyers from the Middle East and Asia have been snapping up masterpieces to fill regional museums -- and pushing prices ever higher.

The Louvre Abu Dhabi -- a franchise of the Paris original -- is a symbol of the oil-rich sheikhdom's drive to boost its "soft power" credentials. To differentiate itself from neighbouring Dubai, Abu Dhabi is targeting affluent tourists looking for culture and art and it has also built hotels, theme parks and malls.

The organisation behind the museum became one of the most aggressive buyers on the global art market over the last decade. It opened last month with more than 600 artworks for its permanent collection, including such Old Master paintings as Giovanni Bellini's "Madonna and Child." Da Vinci's "La Belle Ferronnière" is on loan there from the Louvre in Paris.

The museum's opening has also coincided with a period of heightened political tension in the Gulf and the broader Middle East. As one of the seven sheikhdoms in the United Arab Emirates, and the one with the largest oil reserves, Abu Dhabi is entwined in a Saudi Arabian-led dispute with neighbouring Qatar over its alleged support for terrorism.

Believed to be the last Da Vinci in private hands, "Salvator Mundi" commanded four times what Christie's had projected even as sceptics questioned its authenticity. The seller was Russian billionaire Dmitry Rybolovlev, who purchased it for $127.5 million in 2013.


Salvator Mundi

"We are delighted that the work will again be on public view," a Christie's spokesperson said of the record-setting painting.

Alex Rotter, the auction house's co-chairman of postwar and contemporary art in the Americas, represented the anonymous buyer of the Da Vinci and placed the winning bid after a spellbinding 19-minute contest that saw offers at $200 million, $300 million and $350 million fall short. The result obliterated previous world records for an art sale of any kind, including the auction high of $179.4 million for a Pablo Picasso painting sold in 2015.

At Christie's Da Vinci auction, the salesroom was full of millionaires and billionaires, including Point72 Asset Management's Steve Cohen, Blackstone Group LP's Tom Hill, who collects Old Master works, and philanthropist Eli Broad. —*Katya Kazakina and Mahmoud Habboush*

● Salvator Mundi sold last month at Christie's auction for

$450m

THE BOTTOM LINE The Louvre Abu Dhabi will display Leonardo Da Vinci's "Salvator Mundi" after acquiring the work for $450 million via an intermediary buyer.

Saudi Arabia to Hike Gasoline Prices in January

● Prices at the pump to soar by 80%, jet fuel to be raised to international levels.

Saudi Arabia plans to raise domestic gasoline and jet fuel prices in January, part of a program to gradually eliminate energy subsidies as the kingdom seeks to overhaul its economy and balance the budget, according to a person with knowledge of the matter.

Gasoline prices are set to increase by about 80 percent, while jet fuel prices will be raised to international levels in one go, the person said, asking not to be identified because the matter isn't public. Gasoline and other fuels such as diesel, kerosene and heavy fuel oil, will see incremental price increases over several years, the person said.

Excluding jet fuel, prices won't reach international levels until 2023 at the earliest, and potentially by 2025. Electricity tariffs won't be increased directly, but will rise gradually with other energy prices, the person said. The Finance Ministry, which oversees the subsidy reform program, did not immediately respond to a request for comment.

The new plan represents a slower timeline for the removal of subsidies as the government tries to offset the impact of the measures on a struggling economy. Authorities first reduced subsidies in December 2015 after years of debate as oil prices plummeted. Officials later said they would eliminate them entirely by 2020, part of Crown Prince Mohammed bin Salman's Vision 2030 plan for the post-oil era. — *Wael Mahdi and Vivian Nereim*

THE BOTTOM LINE Gasoline prices will rise by about 80% in Saudi Arabia in January. Jet fuel will also rise to international rates as the Kingdom reduces subsidies to balance its books.

Foreign Brands Lose Ground in Asia

● Local companies are quick to exploit trends and changing tastes

Doing business in Asia was long considered easy money for Western multinationals looking to boost sales, with beverage makers, cigarette brands, and fast-food giants capitalising on rising incomes and weak local rivals. A survey conducted by China Market Research Group in 2011 showed that 85 percent of Chinese consumers preferred buying foreign brands.

Those days are over. The preference for foreign brands dropped to 40 percent in last year's survey, mirroring a trend seen in sales of toothpaste in India, laundry detergent in Vietnam, and flavoured water across the region. It suggests that Asian labels are more price-competitive or better at addressing local preferences, according to a Nielsen report. That spells trouble for global consumer titans at a time when the Asia-Pacific region's economic growth is projected to outpace the world's through 2019, helping to turn such brands as Indonesia's Luwak instant coffee and China's Pechoin moisturiser into rising stars.

"Multinationals underestimated local competition," says Shaun Rein, managing director for China Market Research Group. "Local players have moved very fast on emerging trends that multinationals have missed, like healthy [goods] and e-commerce."

Rein says some Asian companies have proved more nimble than many large global businesses, which can take a long time to make strategic decisions. "Local companies come up with something, and it's done," he says.

◀ A Nescafé-branded cafe in the Harajuku district of Tokyo

As coffee becomes more popular in tea-loving Asia, for example, capturing customers early is crucial. Instant coffee by Indonesia's PT Javaprima Abadi—better known for selling beans plucked from the feces of civet cats—more than doubled its market share in the Asia-Pacific region from 2012 to 2016, to 4 percent, while Nestlé's Nescafé stagnated at about 43 percent, according to research firm Euromonitor International.

In Indonesia's $1.3 billion instant coffee market, the gap is even more pronounced. Javaprima is the market leader, having increased its share 11.5 percentage points, to 32.7 percent, from 2012 to 2016, while Nestlé lost 1.4 percentage points, falling to 16.3 percent. Nestlé declined to comment on the Indonesian market. "Local players have improved product quality and packaging and have picked up on local digital tools a lot faster," says Regan Leggett, an executive director at Nielsen.

Javaprima is capitalising on local trends, such as demand by women and new coffee drinkers for a smooth and creamy brew, according to director Agus Susanto. "I like the taste of Kopi Luwak better than Nescafé, which isn't as flavourful," says Dian Octora, a 36-year-old homemaker in Bandung, West Java. "Nescafé also makes my heart beat much faster."

Local brands also often win on price. A 540-gram (19-ounce) pack of Nescafé White Coffee sells for 65,000 rupiah ($4.80) on Indonesia's Tokopedia e-commerce site, while 450 grams of Luwak's White Koffie sell for 23,000 rupiah.

Nestlé has sought to appeal to local tastes, too. It's rolled out ready-to-drink Nescafé cold coffees in Asia and opened branded cafes at some Chinese universities. In Vietnam it's introduced Nescafé Café Viêt, which offers consumers a traditional Vietnamese coffee in a dry form sold in convenient packets.

"Coffee is getting more popular in Asia, and consumers are asking for more choice," says Wan Ling Martello, who runs Nestlé's Asia, Oceania, and sub-Saharan Africa region. "That opens the door for more competition, and we welcome that." A more competitive market has taken a toll. Nestlé's revenue from Asia, Oceania, and sub-Saharan Africa fell 2 percent, to 14.5 billion Swiss francs ($14.3 billion), from 2014 to 2016—a period that included an instant noodle recall in India.

Multinationals face similar growing competition in cosmetics, another area where foreign brands made big early inroads in Asia. France's L'Oréal SA is the No. 1 beauty group in China. But in the Chinese skin-care market, which is forecast to grow 25 percent by 2021, to $34 billion in sales, the up-and-comer is Pechoin, a domestic brand of creams and whiteners. China's first lady, Peng Liyuan, gave some of the brand's products to Tanzania's first lady, Salma Kikwete, during a visit in 2013. One result: Pechoin, owned by Shanghai Pehchaolin Daily Chemical Co., saw its market share quintuple from 2012 to 2016, to 4 percent, according to Euromonitor.

A popular Pechoin marketing campaign on Chinese messaging service WeChat this year showed a woman hiding a gun in her traditional *qipao* dress before strolling through the streets of Shanghai in the early 1900s and chronicling the history of the city. It ends with her shooting a dark-clad figure surrounded by Dalí-esque melting clocks, proclaiming, "My mission is to fight against time," and introducing Pechoin's skin-care products.

NESCAFE: KIYOSHI OTA/BLOOMBERG

The brand's newfound popularity came partly at the expense of the L'Oréal Paris label, which lost more than a fifth of its market share from 2012 to 2016. Pechoin didn't respond to requests for comment. But Miao Yaoyang, Pechoin's general manager, in June told Wuhan-based *Cosmetic Observer* magazine that the brand tries to show the core value of herbs that are deeply rooted in traditional Chinese life. "Culture is the deep moat of the brand," Miao said. "We want to make products that focus on Chinese people." —*Corinne Gretler*

THE BOTTOM LINE Last year, 40 percent of Chinese consumers said they preferred foreign brands. That's down from 85 percent in 2011, providing an opening for local companies.

Imax, AMC Size Up Saudi Market as Kingdom Opens Up to Cinemas

● Saudi Arabia envisions a cinema industry worth $24 billion by 2030

Imax Corp. and AMC Entertainment Holdings Inc. are among movie-theatre companies interested in expanding into Saudi Arabia, which said it will allow commercial cinemas for the first time in more than 35 years. AMC, based in Leawood, Kansas, agreed to explore potential investments with the kingdom's public investment fund. "Saudi Arabia represents a lucrative business opportunity," Chief Executive Officer Adam Aron said in a statement.

Imax, which operates the only theatre in Saudi Arabia, airing educational films at a science centre, said it's already been approached by chains about building more theatres.

The first multiplexes are expected to open in March 2018, the Ministry of Culture and Information said in a statement on Dec. 11. The aim is to reach 2,000 screens in more than 300 cinemas by 2030, with the industry expected to contribute about $24 billion to the economy and add more than 30,000 permanent jobs, it said.

Saudi Arabia hasn't had public cinemas since the early 1980s. After militants besieged the Grand Mosque in Mecca in 1979, most forms of public entertainment were banned and clerics were given more control over schools, courts and social life.

Saudi Crown Prince Mohammed bin Salman has been breaking established social norms in the kingdom since his rise to power in 2015, including ending a ban on female drivers -- though he's also cracked down on dissent, arresting dozens of clerics and activists and ordering the detention of senior princes and businessmen in what authorities described as an anti-corruption campaign.

The cinema plan is "central to the government's program to encourage an open and rich domestic culture for Saudis," the Information Ministry said.

Conservative Saudis and the country's Islamic clerical establishment have typically frowned upon non-religious forms of entertainment, including cinema and music. Religious police still patrol shopping malls and gender segregation is enforced across the kingdom.

The government didn't say whether the cinemas would have family-only sections, or different show times for men. Movies would be edited according to the "standards of the Kingdom" and would not "contradict with Sharia Laws and moral values," according to a ministry statement carried by the official Saudi Press Agency.

The decision to open cinemas may attract investors as media companies look for new markets. Majid Al Futtaim, a Dubai-based developer of shopping malls, said it will work with Saudi Arabia to expand its Vox Cinemas unit's presence in the kingdom. —*Vivian Nereim and Glen Carey*

THE BOTTOM LINE Saudi Arabia said it will allow commercial cinemas to operate in the country. The announcement has already drawn interest from major entertainment groups.

● The number of permanent jobs Saudi Arabia's Ministry of Culture and Information believes the cinema industry could help to create in the country by the year 2030

30,000

SHUTTERSTOCK

Can Sports Licensing Score Outside the U.S.?

● Fanatics is betting that Europe and China want team logo bikinis, too

Web retailer Fanatics Inc. has crushed the competition in the U.S. sports merchandise industry by selling things fans didn't realise they needed, such as a $40 New York Yankees money clip or a $50 Green Bay Packers bikini. Now, after securing a $1 billion investment from Japan's SoftBank Group Corp. in September, the company is tackling a tougher challenge: sparking an American-style hunger for sports team gear among fans from Bristol to Beijing.

Jacksonville, Fla.-based Fanatics has licensing deals with Nascar, the NFL, Premier League soccer teams such as England's Manchester United, and others. It pairs them with fast-fashion-inspired logistics that let it sell shirts and caps celebrating on-field achievements minutes after the action ends.

That logistics savvy drew the attention of SoftBank Chairman Masayoshi Son, who's betting that the American way of buying sports merchandise will gain more favour overseas than American sports themselves. Fanatics founder Michael Rubin, who sold sports gear startup GSI Commerce to EBay Inc. for $2.4 billion in 2011, is targeting markets such as the U.K. and China in his bid to quintuple annual sales, to $10 billion, over the next five years. The global market is worth $25.3 billion, according to the International Licensing Industry Merchandisers' Association.

Selling sports gear to fans globally can mean rubbing up against entrenched cultural norms. Most of Britain's Premier League clubs were formed in the 19th century as working-class social and cultural hubs rather than businesses. Despite signing multibillion-dollar broadcast rights deals, the clubs have been more reluctant than U.S. sports franchises to embrace commercial opportunities.

"British football fans have been conditioned in a very different environment to U.S. sports fans," says Simon Chadwick, professor of sports enterprise at the University of Salford in Manchester. "They're more guarded about the excesses you see in U.S. sport, because the tribal norms are very different."

Take pregame rituals. In the U.S., tailgating parties give Fanatics the opportunity to hawk branded grill covers and cornhole sets. But in England, where soccer authorities have been battling hooliganism for decades, the buildup to a game is less relaxed. Streets around stadiums are heavily policed, and alcohol is banned in the stands, so thousands of fans pack into local pubs every Saturday lunchtime to sing and drink.

And although sports jerseys are an accepted form of casual wear in the U.S., that's not always the case elsewhere. "In the U.K., if you wear your team's colours, a lot of people think you're not dressing up enough," says Kit Walsh, a partner at Fermata Partners, who helps clubs such as Arsenal and Liverpool market branded goods in the U.S.

Fanatics managers say American sports fans buy more merchandise than their British counterparts because they have access to a wider range of memorabilia—a gap the company is determined to close through smarter marketing. When Sergio Aguero broke Manchester City's all-time goal-scoring record in Naples, Italy, in November, Fanatics immediately released commemorative T-shirts, as well as a mug and a scarf. That quick response helped double the player's merchandise sales that week.

Fanatics' international sales amount to about $200 million, but Steve Davis, president of the international division, wants business outside the U.S. to make up about half the company's $10 billion revenue target in five years. He plans to open manufacturing facilities in Germany and China next year, then in Japan and Australia in 2019.

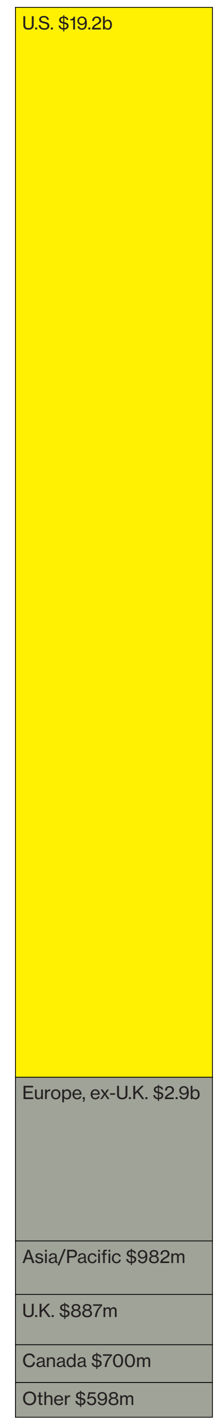
China, where President Xi Jinping aims to build a $750 billion sports industry by 2025, is a particular focus for Fanatics. The company will need to cultivate a culture of buying licensed jerseys in a country that's still riddled with counterfeit products. To gain a better understanding of the nuances of the market, it plans to recruit managers locally.

The company will also be going up against the Chinese state, which wants its domestic soccer league to compete financially with the Premier League teams that have deals with Fanatics. Chinese Super League clubs, backed by the country's biggest businesspeople and state-controlled companies, spent a combined $451 million signing players in 2016, international governing body FIFA says. That's attracting fans to matches, too: Attendance has increased at an average rate of more than 10 percent per season since 2014, according to Euromonitor International. At that rate, attendance will surpass the Premier League's by 2020.

Fanatics says Chinese soccer's rapid growth should boost, rather than detract from, interest in the Premier League—and in the gear the company sells under license from the English teams. "There's a huge fan base in China that's completely underserved," Davis says. "It's the biggest and most pressing opportunity for our partner clubs." *—Sam Chambers*

THE BOTTOM LINE U.S. e-tailer Fanatics is trying to replicate its U.S. success by selling licensed sports gear globally. But logo mugs and event-based T-shirts are less common overseas.

● Licensed sports merchandise sales in 2016



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GM Jumps Ahead In Self-Driving Cars

The new Chevy Bolt is one of the most advanced driverless cars yet, thanks to a startup the automaker bought last year

Three years ago, General Motors Co. wouldn't even let its self-driving cars out of the parking lot. Its custom Chevrolet Volt hybrids, meant to autonomously ferry employees around GM's 700-acre research and development campus in the Detroit suburb of Warren, Mich., could only handle basic driving and topped out at about 25 miles per hour.

At the time, Silicon Valley's legions of programmers had a big lead on Detroit. Automakers were struggling to develop operating systems as intuitive as Apple Inc.'s and Google's, and Google had already been working for years to bring artificial intelligence to cars, while Apple was working to spin up a similar project. If either company, or Elon Musk's Tesla Inc., beat the likes of GM and Ford Motor Co. to reliable, mass-market driverless vehicles, the old-school carmakers would be doomed to become mere manufacturers such as Foxconn Technology Group—low-margin assembly lines that left the high-value design work to others.

Today, the field looks different. Apple has scaled back its automotive ambitions, laying off staff and extending the deadlines for those who are left. Google's parent, Alphabet Inc., is locked in a brutal battle with Uber Technologies Inc. over the intellectual property of Alphabet's driverless unit, Waymo. Tesla can barely get its driver-required Model 3 out of its factories. Meanwhile, on Nov. 29, GM unveiled the latest version of its electric Chevy Bolt, a close second to Waymo's self-driving minivans as the most advanced autonomous car the world has seen. Among other things, GM intends the Bolts to form the backbone of a robo-taxi business it plans to start in 2019.

"Autonomous driving is one of the most difficult software challenges of the decade, if not the century," says Kyle Vogt, the face of GM's automation efforts. And yet, improbably, the sleepy old automaker is a contender to solve it.

GM's first shots at a self-driving Bolt fired off pulses of laser-based radar, known as lidar, using roof-mounted rods that looked like goal posts; the third-generation one has its scaled-down lidar gear built into the roof rack. The old model had sensors poking through holes sawed into the body near the front wheels; the new one has them hidden behind the grille and front fender. It's tough to overstate

ILLUSTRATION BY KURT WOERPEL

how much it looks and feels like a regular car that just happens to do all the driving itself. The self-driving Bolt can handle speeds up to 30 mph or the twists and turns of congested San Francisco without incident. Waymo's minivans, by contrast, tend to stick to the broad streets of Phoenix's suburbs but can hit highway speeds.

Detroit's driverless comeback wasn't homemade. GM owes its resurgence to the AI acumen and good name of San Francisco startup Cruise Automation, Vogt's company, which it acquired last year for $581 million. (If Cruise meets certain deadlines that come with incentive payments, it'll wind up clearing almost $1 billion.) "GM is a leader because Cruise has allowed them to attract amazing talent," says Reilly Brennan, a partner at Trucks Venture Capital who lectures at Stanford.

Vogt created Cruise after co-founding Twitch, the streaming service popular with young people who want to watch others play video games. Amazon.com Inc. bought Twitch in 2014 for $1.1 billion; shortly before, Vogt created Cruise with the idea that he'd make portable driverless software, some kind of system that could be bolted onto existing vehicles. While experimenting with Audi sedans and the Nissan electric Leaf, he began to recognise that it'd be a lot easier to engineer the technology directly into a car's onboard controls.

"The Chevy Bolt was the only platform suitable to do that," Vogt says. At the behest of GM Chief Executive Officer Mary Barra, President Daniel Ammann started hammering out a deal with Vogt later that year after Vogt got a permit to start testing his self-driving vehicles on California roadways. "When we looked at the hardcore software engineering we needed, we saw a gap," Ammann says.

By the time GM bought Cruise, Vogt's team had figured out several key problems a few levels above the carmaker's sight lines, says Doug Parks, GM's vice president of autonomous technology. "Their guys were passing double-parked cars," he says. "We weren't even thinking about that." Over the past year and a half, the team has customised almost half the driver-operated Bolt's hardware components. "When you take technology to a company that can make millions of cars a year, you can get anything to market cheaper and faster," Vogt says, adding that his Bolts are already being tested on the road in four cities and could lose their steering wheels entirely sometime next year.

Vogt says he knows early achievements don't mean a lasting lead in the driverless race. At Cruise's San Francisco headquarters, he's continued to hire coders and mechanical engineers to work on the Bolt, pushing the total past 400. (Before the acquisition, Cruise had about 40 employees.) He also bought lidar maker Strobe, which he says will cut per-unit spending on the laser gear 99 percent; he wouldn't say how much he paid for the company.

As more self-driving cars make their way onto public roadways, they'll likely be watched especially closely by federal regulators. No one can afford a crisis like the ignition switch malfunction that was tied to 124 deaths before GM recalled some 30 million cars in 2014. The company concealed the crisis for years and eventually agreed to pay a $900 million penalty to the U.S. Department of Justice. Vogt says his goal is to eliminate traffic fatalities altogether.

Eric Noble, president of consulting firm CarLab, says self-driving software could need as much as 3 million miles of durability testing to be considered acceptable by the National Highway Traffic Safety Administration. GM is testing its cars in tough traffic around San Francisco, but they were involved in 20 of the 25 reported self-driving collisions and fender benders in California this year. Ammann says none of those incidents were the Bolts' fault.

Whatever happens in the long term, moving to the front of the self-driving pack remains a huge move for GM, Noble says. "It will be a long time," he says, "before we have a winner." *—David Welch*

THE BOTTOM LINE GM bought its way into contention among self-driving car companies but has a lot of work to do to keep pace with leader Waymo.

● GM paid

$581m

for Cruise last year. If Cruise meets deadlines that trigger incentive payments, it'll clear almost

$1b

Fighting Climate Change, Burp by Burp

● Cows are a major source of methane. A vaccine could change that

In a cream-coloured metal barn two hours north of Wellington, New Zealand, a black-and-white dairy cow stands in what looks like an oversize fish tank. Through the transparent Plexiglas walls, she can see three other cows in adjacent identical cubicles munching their food in companionable silence. Tubes sprout from the tops of the boxes, exchanging fresh air for the stale stuff inside. The cows, their owners say, could help slow climate change.

Livestock has directly caused about one-quarter of Earth's warming in the industrial age, and scientists from the U.S. departments of agriculture and energy say bigger, more resource-heavy cattle are accelerating the problem. Contrary to popular belief, cows contribute to global warming mostly through their burps, not their flatulence. So about a dozen scientists here at AgResearch Grasslands, a government-owned facility, are trying to develop a vaccine to stop those burps. "This is not a standard vaccine," says Peter Janssen, the anti-burp program's principal research scientist. "It's proving to be an elusive little genie to get out of the bottle."

The effort isn't entirely altruistic. Grasslands is dedicated to boosting New Zealand's dominant agriculture and biotech industries, and the country's biggest company, Fonterra Co-operative Group Ltd., a $14 billion dairy processor, has vowed to increase its milk exports without increasing carbon emissions. But 2017 is set to be the third-hottest year on record—the top two were 2016 and 2015—so the globe can use all the help it can get, business-minded or not. "It's essential to reduce global livestock emissions in order to reduce climate change consistent with what countries signed up to under the Paris Agreement," says Andy Reisinger, deputy director of the New Zealand Agricultural Greenhouse Gas Research Centre.

Janssen and his team are trying to purge cow stomachs of methanogens, the microbes that convert hydrogen into methane, a potent greenhouse gas. It's an unexpectedly delicate and ▶

▲ Janssen and his team haven't gotten an anti-methane vaccine far enough to test it on the cows encased in Plexiglas in their barn

◀ difficult task, because cows rely on a host of other bacteria, fungi, and protozoa in their guts to digest the grasses they eat. Researchers have tried feeding them oregano, tea extracts, probiotics, antibiotics, seaweed (too toxic), coconut oil (too expensive), chloroform (too carcinogenic), and even leftover grains from beer brewing (which made cows poop more nitrous oxide, another greenhouse gas).

So far no vaccine has progressed far enough to be given to the cows in the cubicles, where methane output can be measured. The vaccine must first be successfully tested in the lab and on sheep. Although the scientists have figured out how to produce the desired antibodies in the cows, the animals continue to merrily burp. Janssen's team is looking for proteins they can use to concoct a stronger vaccine, one that will better prime the cows' immune systems to attack methanogens. A single methanogen genome has 2,000 proteins, so they've narrowed their search to a handful of candidates, which they think could knock out the gassiest microbes.

The hunt for a vaccine costs about $1.4 million a year, about two-thirds of which comes from the New Zealand government. Industry supplies the rest. The money is part of a $7.5 million pool for curbing farming gases meant to address New Zealand's status as the world's highest per capita methane emitter. Janssen says it may take five years or longer to create the right vaccine, but it will do much more to reduce bovine emissions than a treatment that Dutch company DSM is developing for bucket-fed cows. That's because the vaccine will work just as well for grazers. "There aren't too many ruminants in the world where the animals never get to eat grass," he says, noting that even cows fattened with feed in a controlled environment typically start out in pastures.

DSM used computers to create a methane-blocking molecule called 3-nitrooxypropanol, or 3-NOP, that appears to cut burped methane by about a third when sprinkled on a cow's food. The company, whose annual research and development budget is $500 million, is waiting for approval from the U.S. Food and Drug Administration, which is likely to take at least two more years. "For developed countries, this is the most promising technology at this point," says Alexander Hristov, a Penn State professor of dairy nutrition who's tested 3-NOP for DSM. The New Zealanders are leading the vaccine hunt, he says, but they haven't developed a proven product they can offer to farmers.

Janssen, a bespectacled man with the lanky limbs of a longtime mountain explorer, says his team is also working on substances similar to 3-NOP that could be given in pill form. A complicating factor: No one knows how low-methane a cow can go without hurting its health or productivity. Trials suggest cows that burp less seem to cope fine, but scientists want to make sure there are no unintended consequences, such as reduced milk quality or quantity. "We need to understand where that tipping point is," Janssen says.

Humans are the final hurdle. Canadian scientists created low-polluting pigs almost a decade ago, but people wouldn't buy the genetically modified pork. "Farmers will produce what the consumer demands," says Tim McAllister, who's conducting trials of 3-NOP and other methane-reduction techniques for the Canadian government at the Lethbridge Research and Development Centre in Alberta. Soaring global demand for meat makes climate concerns pressing. North of Wellington, the cows seem content in their tanks, turning to watch as Janssen strides between their boxes. For now, their burps are packed with methane, but they may not have to be. —*Eloise Gibson*

This article was reported with support from the UC Berkeley-11th Hour Food and Farming Journalism Fellowship

THE BOTTOM LINE Researchers are painstakingly hunting for compounds that can quell methane-packed cow burps but will still have to sell regulators and the public on the science.

"This is not a standard vaccine. It's proving to be an elusive little genie to get out of the bottle"

PHOTOGRAPHS BY JAKE MEIN FOR BLOOMBERG BUSINESSWEEK

Faltering Fowl Fuel Finnish Fury

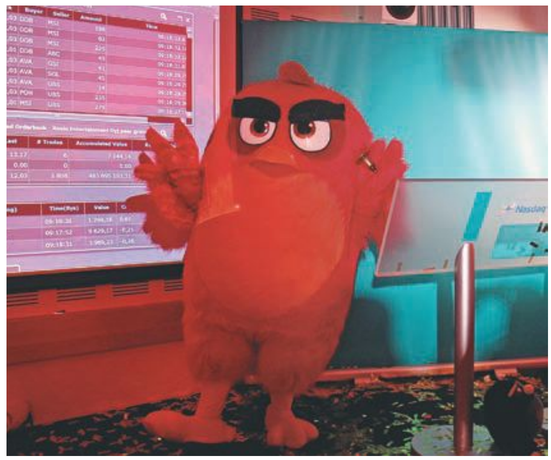
● The maker of *Angry Birds* has seen its share price plunge since its IPO

When Rovio Entertainment Oyj went public in September, investors eager to grab a piece of the producer of *Angry Birds* flocked to the stock, making it Finland's hottest share offering in a decade. These days, Rovio looks about as airworthy as a clay pigeon.

After a promotional campaign that included neon billboards, full-page newspaper spreads, and bus ads featuring the company's trademark scowling fowl, thousands of Finns submitted buy orders with their brokers. Although the initial public offering gave Rovio a market value of €900 million ($1.1 billion)—half what the company had first aimed for—the stock got a small bounce when a bank backing the IPO started purchasing shares to "stabilise" the price. That effort ended in October, and after Rovio on Nov. 23 disclosed that its marketing costs had soared, the shares dove 22 percent, spurring many buyers to think they'd gotten a turkey. "I'm disappointed in what they had led the market to believe," says Tomi Lahti, a Helsinki investor who bought stock in the offering.

Rovio's problem is that it remains overly dependent on its flagship title, in which users fling cranky cardinals, canaries, and eagles at various objects to knock them down. Since launching the original in 2009, the company has introduced at least 25 derivative games such as *Star Wars*-, *Transformers*-, and *Rio*-themed versions. Last year it co-produced *The Angry Birds Movie*, which had ticket sales of almost $350 million for a film that Rovio says cost $100 million to make. But mobile games require frequent updates as less than 5 percent of users typically play a title for more than a month, and just about half that number make in-app purchases—the way companies like Rovio earn money—such as a higher-powered slingshot that helps the surly birds inflict more damage. "Getting people to come back and continue playing is tough," says Matthew Kanterman, a games analyst at Bloomberg Intelligence. Companies must "keep giving them something new each day."

Rovio's attempts to broaden its portfolio have largely disappointed, with titles such as *Jolly Jam* and *Travel Match Club* pulled from app stores within a year of publication. A 2012 puzzle game called *Amazing Alex* sold well early on but was quickly forgotten and taken off the market in 2015. Of the 19 games available from Rovio these days, 16 are *Angry Birds*-themed, and only one—*Angry Birds 2*, released in 2015—ranks among the top 100 U.S. offerings in the iOS App Store, according to researcher App Annie. An effort by Rovio to publish books and run its own animation studios, key to its plan to become a broader



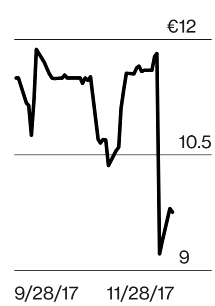
◀ *Angry Birds*' Red joined Rovio's listing ceremony in September

entertainment company, ended in March, when it sold those businesses to a former executive.

Rovio says it can keep growing with new titles including *Battle Bay*, a multiplayer game in which teams of boats face off amid rolling waves. Chief Executive Officer Kati Levoranta says the company is developing about 10 games, both inside and outside the birdcage, and that Rovio can extend the lifespan of titles by adding features and characters such as the Thanksgiving-themed Cold Turkey and a feather-clad Eddie, the mascot of the heavy metal band Iron Maiden. "The *Angry Birds* brand is a very unique asset," she says. "It has already shown its longevity and capability to be versatile."

The three analysts who cover Rovio—all from banks involved in the IPO—have buy recommendations on the shares. While the company depends heavily on a single franchise, it's a phenomenally successful one. *Angry Birds* and related titles have been downloaded 3.7 billion times and last year generated more than $24 million in licensing fees for merchandise including T-shirts, toys, and comic books. Rovio has shown it can persevere in pursuit of golden eggs. From 2003 to 2009, it drove itself to the brink of bankruptcy developing more than 50 games, typically with gloomy titles such as *Darkest Fear*, *Cyber Blood*, and *Wolf Moon*. Then it came up with *Angry Birds*, a silly but entertaining confection that capitalised on the iPhone's touchscreen technology. "The positive for *Angry Birds* is that it's well-known," says Hannu Rauhala, an analyst at OP Group in Helsinki. "And these days, games can have a long lifespan."
—*Kati Pohjanpalo and Ville Heiskanen*

● Rovio stock price



THE BOTTOM LINE Investors who bought into Rovio's IPO have been disappointed as the company struggles to expand its business outside the birdcage.

OUTI-KAISA OLLIKAINEN/NASDAQ; DATA: BLOOMBERG

This *Is* Your Father's Stock Market

● Almost half of Americans 75 and older hold some equities

U.S. stocks have more than tripled in value since 2009, but the bull market has left a lot of Americans behind. In almost every age group, the share of families owning equities—either directly or through funds and retirement accounts—declined from 2007 to 2016, according to the Federal Reserve's most recent Survey of Consumer Finances. There's one prominent exception: households headed by someone 75 or older.

Almost 49 percent of those households own stocks, up from 40 percent in 2007, just before the financial crisis, and about 35 percent in 2013, as many Americans were still recovering from the wreckage. It's the highest number since the Fed began its triennial report on Americans and their money in 1989.

The top rate of stock ownership, 58 percent, is among families headed by people 55 to 64, just before traditional retirement age. Retired investors have historically been conservative. While stocks can provide larger returns over the long term, they're prone to dramatic crashes—like the more than 50 percent drop in the 2007-09 bear market—and an octogenarian doesn't have decades to wait for a rebound. Retirees often rely on their investments for income and emergency expenses. But the numbers suggest a generational change: Americans who have relied less on traditional pensions and more on 401(k)s and individual retirement accounts are aging into the 75-plus group.

Financial advisers say there's also a particular reason some retirees are choosing stocks now. "There's a lack of alternatives out there," says Austin Frye, a financial planner at Frye Financial Center in Aventura, Fla. Yields on bonds are at near-record lows, while the most generous banks pay savers rates of barely 1 percent per year. As a result, dividend-paying stocks have become popular among seniors because they generate income.

Older investors don't necessarily deserve their reputation for being cautious and risk-averse, says John Grable, a professor of financial planning at the University of Georgia who studies risk tolerance. They "often have more knowledge,

ILLUSTRATION BY THOMAS COLLIGAN

experience, and a wider perspective than others," he says. Almost all investors remember the tech bubble and the financial crisis. Seniors also remember the roaring bull markets of the '80s and '90s. Frye says his older clients are "very comfortable with stocks because they've been investing in them for a lifetime."

The elderly have also had more time to build up a nest egg, giving some of them "the financial resources to withstand a potential loss," Grable says. The wealth gap between the oldest and youngest Americans widened to the largest on record in 2016, with the typical household headed by someone 75 or older boasting a net worth more than 24 times that of one headed by a person under 35.

Why are younger Americans less likely to own stocks today than in 2007? Part of the blame may go to the lingering trauma of the financial crisis. But workers have also faced a sluggish pace of wage growth throughout the economic recovery. That, combined with record levels of student debt, has made it difficult for young households to save and invest at all. While median wealth for the oldest cohort of Americans is up 7 percent from 2007, it's down 20 percent for the youngest, after adjusting for inflation.

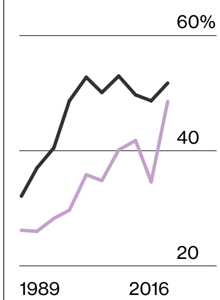
As a group, the oldest Americans now have an unprecedented amount of wealth, which many are eager to pass on to future generations of their families. If a retiree's goal is passing on an inheritance or giving to charity, taking risks in the stock market may be appropriate. For many seniors, however, leaving a legacy ought to be a secondary goal to providing for their own livelihood, says Allan Roth, a financial planner at Wealth Logic LLC in Colorado Springs. And he warns that too many older Americans are placing a dangerous bet by loading up on stocks. "It's a very risky world," says Roth. At some point, "markets are going to plunge," he says, and there's no guarantee that they'll recover as quickly as they did after the last two crashes. —*Jordan Yadoo and Ben Steverman*

THE BOTTOM LINE The first wave of Americans who saved via 401(k)s is moving deeper into retirement. They don't find bonds' paltry income very enticing.

● Share of U.S. households that own stocks*

All households

Households whose head is 75 or older



Look in Volume 'B' for Buffett

● Why Berkshire Hathaway is still in the encyclopedia business

Warren Buffett has eclectic taste in companies. Along with large, thriving businesses such as Geico and the BNSF Railway, he's accumulated a collection of head-scratchers. There's a bowling shoe brand, a maker of vacuum cleaner bags, almost three dozen newspapers, and the manufacturer of Ginsu knives.

Then there's World Book. Once sold to millions of American families, its encyclopedias were described by Buffett as "something special" when he acquired the company. And for years he wasn't wrong. The business mattered enough to break out its earnings in annual reports for his Berkshire Hathaway Inc.—$32 million before taxes in 1990 alone. With the ascent of the personal computer and the internet in the 1990s, sales plunged, but Buffett let the business plod along. As Berkshire grew, World Book's results became a rounding error.

Yet here we are more than three decades later, as World Book celebrates its 100th anniversary, underlining a quirk of the Berkshire method: One of the world's greatest investors has created a conglomerate that holds on to a bunch of companies that are well past their prime. "Because of his model, he's got many more rounding errors in there than he might have wanted," says Steve Wallman, a longtime Berkshire investor and money manager in Wisconsin. "He's spent a lot of time around businesses that were dead or were thought to be dead."

Buffett contends that this loyalty helps him buy more companies. The conglomerate, he's said, has no "exit strategy" for the businesses it buys—it doesn't flip acquisitions for a quick profit. "That's one reason why Berkshire is usually the first—and sometimes the only—choice for sellers and their managers," he wrote to shareholders in 2003. And it's hard to argue with Buffett's success: A hundred dollars invested in Berkshire when he took control in 1965 is worth more than $2 million today. For the people running these companies, though, it creates a challenge. How do you rally staff at a business that's faded and is in search of relevance?

At World Book, this task has fallen to Jim ▶

"My main competitor is distraction—kids playing Xbox games, Snapchat"

CREDITS CREDITS CREDITS

◀ O'Rourke, a 46-year-old media executive who joined three years ago. World Book is still published in paper form—you can buy it for $999—though the company long ago shifted focus to selling online subscriptions to libraries and schools. It also publishes books besides encyclopedias. But that's not exactly a growth strategy.

O'Rourke is trying to draw consumers back. In August the company launched a mobile app and online portal called World Book WOW that packages its voluminous content, along with e-books and games, for third- to eighth-graders. It costs $7.95 a month, and so far more than 10,000 have subscribed. "My main competitor is distraction—kids playing Xbox games, Snapchat," says O'Rourke, who sports an Apple Watch and works in an uncluttered office with views of the Chicago River.

When the first edition of the World Book came out in 1917, its illustrations were as cutting-edge as today's virtual-reality video games. By the late 1950s the company was printing more than half a million sets a year, many of which were sold door to door. At one point the sales force numbered more than 40,000. And then there were the publicity stunts: In the 1960s the publisher sponsored a search for the Loch Ness Monster in Scotland and sent explorer Sir Edmund Hillary on a nine-month expedition to Mount Everest to look for the Yeti. That neither creature was ever found did nothing to lessen the buzz such spectacles created.

In the late 1970s, Scott Fetzer Co., a small conglomerate in Ohio best known for Kirby vacuum cleaners, bought World Book. The marriage wasn't so strange: Kirbys, like World Book sets, were sold door to door and had steep price tags. Families often financed the purchase of both products, and providing loans was a lucrative side business. That combination piqued Buffett's interest, and in 1985 he bought the company. World Book, he noted at the time, racked up more sales in the U.S. than its four largest competitors combined.

Then came the onslaught: first CD-ROMs such as Microsoft Corp.'s Encarta and later the rise of Wikipedia. World Book had become the "most difficult problem" for Berkshire, Buffett wrote as early as 1996. By the time O'Rourke arrived, the publisher was a shadow of its former self. The company still stubbornly printed its flagship encyclopedia and annual updates called Year Books, even though Encyclopaedia Britannica had announced two years earlier that it would no longer issue a print edition.

It's early, but O'Rourke has been getting results. Margins have improved over the past three years, in part because of cost-cutting. Revenue is also up, climbing 9 percent last year, he says, while declining to give the amount. Operating income has grown 40 percent since the end of 2014. Still, it's tough to compete with the latest from Silicon Valley when you're a 100-year-old publisher with an owner who's unlikely to plow a lot more money into the business.

A bit of help is coming from an unlikely source: After decades of declines, sales of print encyclopedias rose last year and are projected to do so again. Why? It doesn't hurt that World Book is the last of its kind, a multivolume encyclopedia that's updated each year. "As long as we're profitable doing it and we continue to publish a great product," O'Rourke says, "we're going to keep doing it." —*Noah Buhayar*

THE BOTTOM LINE Buffett often hangs on to small businesses past their prime. He says it helps him get better deals on future acquisitions, since owners want buyers in it for the long term.

The Unlucky Tycoon

● Wang Jing has business interests on four continents—and a long list of woes

A SpaceX rocket that exploded last year left three of the world's most ambitious entrepreneurs red-faced. Elon Musk tweeted about the failure of his launch vehicle, and Mark Zuckerberg wrote on Facebook about the blow to his plans for expanding the internet in Africa using the Amos 6 satellite onboard. Wang Jing, the least well-known of them, scrapped his plans to buy Space Communications, which owned the satellite.

For Wang, 44, it was another in a string of setbacks for projects around the globe. His plans for a $10 billion deep-water port in Crimea fell through after Russia annexed the region in 2014. That same year he broke ground on a $50 billion canal in Nicaragua to compete with Panama's. Little ground has moved since. A separate deal in Ukraine has been tied up by that country's courts. Wang was also a high-profile loser in China's 2015 stock market crash. After his Beijing Xinwei Technology Group added $30 billion in market value in less than a year, making Wang one of China's richest people, the collapse wiped out three-quarters of those gains within four months. The telecom equipment company's shares have been suspended since last December, after they fell 10 percent in one day on a Chinese media report questioning Xinwei's business model, including in Cambodia. The company has published a 105-page report denying any wrongdoing and providing clarifications on its global operations.


● Wang

Wang, who says he made his fortune mining in Southeast Asia before turning to telecommunications, is involved in the leadership of 30 companies, according to the website of his Hong Kong-based construction company, HKND Group. "I am a very ordinary Chinese person," he told Bloomberg in 2013, the year HKND secured the Nicaragua canal project. "I can't be any more ordinary." His Xinwei stake, which once put him among the world's multibillionaires, is now worth about $350 million, after

PHOTOGRAPH: DIETER DEPYPERE/BLOOMBERG; *DIRECTLY OR VIA MUTUAL FUNDS OR RETIREMENT ACCOUNTS; DATA: FEDERAL RESERVE SURVEY OF CONSUMER FINANCES subtracting pledged shares.

Wang's business model is based on pledging high-flying shares to finance projects. Xinwei went public in 2014 via what's known as a reverse takeover, in which a private company buys a public company to use its exchange listing. The stock soared after the deal, and Wang and other shareholders began using their stakes essentially as collateral to raise money, according to an analysis of company filings. He has pledged 85 percent of his stake; the stake was valued at more than $2 billion at the last traded price on Dec. 23, 2016. In July, Wang unpledged some shares promised to China's Development Bank to make stock payments to some other shareholders related to a missed profit target at Xinwei.

His overseas projects, most of which are in poor countries, have used something called buyers' credit. From Tanzania to Cambodia, Xinwei guaranteed loans from Chinese banks to its foreign clients, who used the proceeds to buy goods and services from Xinwei. In an October filing to the Shanghai exchange, Xinwei said it had guaranteed 15 billion yuan ($2.3 billion), mostly for nonsubsidiaries, equivalent to 123 percent of the company's net assets.

Despite recent difficulties, Wang continues to operate across four continents, even as a clampdown at home has targeted several Chinese multinational conglomerates. His access to financing and the fact that his projects are often in line with Chinese government objectives have led to speculation abroad that, in some of his ventures, he may be acting on behalf of the state, something Wang says isn't true. "You can't get this kind of cash in China without having Party chops," says Dennis Wilder, former director for East Asian affairs at the National Security Council under George W. Bush.

It's hard to know whether Wang is a proxy for the Chinese state or just good at aligning with Beijing's interests, says Usha Haley, a professor of management at West Virginia University who's testified on a takeover by a different Chinese company before the U.S. Senate. For Chinese tycoons, "it's about synchronising your goal to the Party goal." Wang's interest in space aligns with the government's goal of expanding China's network of satellites. He launched a low-orbit satellite with Tsinghua University in 2014, the first of dozens he promised to put into space by 2019. Xinwei's cancelled bid for Space Communications was worth $285 million.

Wang's foray into Ukraine appeared to be in accord with the Chinese government's plans to extend its influence abroad. He met with Ukraine's ambassador to China and co-founded Ukraine House in Beijing in 2014. The following year, the country agreed to join President Xi's One Belt One Road initiative, an effort to bind more than 60 countries in trade.

Now, Wang has hit a roadblock in Ukraine. One of his companies tried to buy a stake in Motor Sich PJSC, Ukraine's biggest maker of aircraft and helicopter engines. A court in Kiev froze those shares in September. Ukraine's security service and prosecutors say that the buyout could "eliminate" domestic jet-engine production by moving capacity offshore. Motor Sich said in a July statement on its website that it had done nothing wrong and has cooperated with investigators; it declined requests for additional comment. The Ukraine court doesn't name Wang in its order. It lists businesses involved in the deal, including a unit of his Skyrizon group of companies, according to Chinese filings.

One reason some Ukrainians are wary: Years ago, China's military bought its first aircraft carrier, a decaying Soviet-era hull that it later refurbished for military use, from Ukraine. The middleman in the deal was a Hong Kong-based businessman who said he wanted to turn the carrier into a floating casino.

The stalled deal could have repercussions for Wang's other investments. Filings show some of his pledges of Xinwei shares were to guarantee financing for his Skyrizon companies. The pledges are worth as much as $550 million based on the last traded price. Meanwhile, Xinwei has said its trading suspension keeps being extended, not because "things aren't running smoothly," as is the case with other suspended companies, but because of a complex restructuring involving approvals from defence regulators. The revamp would allow Xinwei to raise funds to buy a company from Wang linked to the Ukraine venture or its assets.

The canal project was greenlighted in 2013 by Nicaragua's legislature and includes an airport, ports, a railway, and two free-trade areas. Wang's HKND has also funded philanthropic ventures, including an opera festival in which Nicaraguan President Daniel Ortega's son Laureano played one of the lead roles. HKND said in a June statement it was completing designs for a Pacific port and procuring a better location for the canal locks to avoid seismic faults.

Wang has said he plans to turn Xinwei into one of the world's top three telecommunications companies. But in many countries where the company operates, such as Cambodia, there are few signs of a major telecom enterprise. In Nicaragua it took four years from the time Xinwei signed a contract to provide mobile phone service before the company installed 1,000 wireless base stations, according to Nicaragua state media. "Xinwei really has a ghost presence on the ground," says Monica DeHart, an anthropologist at Puget Sound University who studies China's footprint in Nicaragua. Local press in China and Nicaragua have called Wang the "canal madman," sceptical that his plan for a second shipping route across Central America will ever be realised. Unless he finds a solution to his Ukraine problem, his canal dreams may look more and more like a fantasy. *—Blake Schmidt and Pei Yi Mak, with Volodymyr Verbyany, Peter Martin, and Adrian Leung*

"You can't get that kind of cash in China without having Party chops"

THE BOTTOM LINE Wang has used pledged shares as a way to guarantee financing for ambitious projects, including one that's run into legal trouble in Ukraine.

How Guangzhou

● The manufacturing hub is incubating flying cars and automated pharmacies

On a sunny afternoon in early November, several dozen software engineers and designers are anxiously preparing for a test flight of the EHang 184, a compact metal and glass pod outfitted with eight propellers. The self-steering, single-passenger craft could begin buzzing through the skies of Dubai as early as next year, says Hu Huazhi, the 40-year-old chain-smoking founder, chairman, and chief executive officer of EHang, a Guangzhou-based maker of drones. The rulers of the Arab city-state want one-quarter of all transport to be autonomous by 2030 and are in talks with EHang about supplying a fleet of air taxis.

Earning bragging rights for building one of the world's first flying cars is not just a corporate goal. "Our company's development is also an integral component of the Guangzhou government's plan" to move up the technology ladder, says Hu as he shows visitors around the company's offices and flight command centre, which are housed inside an abandoned amusement park devoted to the wonders of space travel.

Some 19 miles away, at a factory complex owned by Guangzhou Automobile Group Co. (GAC), rows of orange-and-black German-made industrial robots pivot and plunge as they assemble and solder Trumpchi-brand SUVs, with few workers in sight. With the blessing and support of local officials, the state-owned carmaker is building a $6.5 billion industrial park nearby to produce connected new-energy vehicles. "The economic structural transformation you see here is not only for the benefit of enterprises—we also have a responsibility to the country," says GAC President Feng Xingya in an interview at company headquarters. "We are trying to achieve innovation-driven development, and we must carry out the government's policy to succeed."

Guangzhou, a sprawling port city on the Pearl River that's home to stodgy state-owned enterprises (SOEs) as well as scrappy textile and electronics producers, is starting to look like the poster child for China's effort to transform its economy. "Made in China 2025," an initiative unveiled by President Xi Jinping's administration two years ago, directs cities and companies to shift out of low-cost, labour-intensive manufacturing and into higher value-added production. State planners want companies to become globally competitive in established industries such as autos, as well as dominate new ones like drones and artificial intelligence. "China wants to raise productivity in every part of the economy. And that includes improving the quality of human talent, how capital is used, and how technology is developed," says Scott Kennedy, director of the Project on Chinese Business and Political Economy at the Center for Strategic and International Studies (CSIS) in Washington. "They think that doesn't happen naturally. The government has to put their finger on the scale to make that transition happen in a way that is productive for the country."

Made in China sets ambitious targets for things like the deployment of Chinese-made robots and domestic content in the production of advanced electronics. The job of delivering on those goals falls largely to provinces and cities across the country. As China's third-largest municipality by gross domestic product and an important manufacturing base, Guangzhou was destined to play a starring role in the implementation of Beijing's blueprint. Earlier this year the city unveiled a plan that aims for trillions of yuan in revenue from information technology, artificial intelligence, biomedicine, advanced manufacturing, shipping, new energy, and other industries by 2021. City officials have travelled to Singapore, Chicago, and Silicon Valley this year to tout Guangzhou's attractions as a business and manufacturing hub.

Companies are heeding the call. Foxconn Technology Group started construction in March on an $8.8 billion LCD manufacturing facility. And in April, Cisco Systems Inc. held a groundbreaking ceremony for a multibillion-dollar "smart city project" and an internet research and development centre.

Guangzhou's efforts should get a lift from Beijing's push to create a "Greater Bay Area" by linking the nearby territories of Hong Kong and Macau with Guangdong province. Guangzhou, the provincial capital, is supposed to serve as an administrative and logistics hub for neighbouring Pearl River Delta manufacturing cities such as Foshan and Zhongshan. While the idea predates Xi's rule, it appears to have fresh momentum. "Guangzhou will take full advantage of the Guangdong-Hong Kong-Macau Greater Bay Area to strengthen cooperation with cities involved in this national-level development blueprint," said Guangzhou Party Secretary

Does 'Made in China'

Ren Xuefeng, speaking at the 19th Communist Party Congress in Beijing in October.

To speed the transition, the Guangzhou government is offering companies an array of incentives, including subsidies, low-interest loans, and tax exemptions. Municipal authorities have set up four 10 billion-yuan ($1.5 billion) funds to support new industries and upgrades at old ones and are doling out one-time payments to factories that automate. The land where Guangzhou Auto is building its vehicle factory was provided free of charge, according to Feng. "The rapid development of GAC could not be achieved without preferential policies from Guangzhou, Guangdong province, and the central government," he says. "This is the most supportive environment we have ever experienced."

China's determination to become a force in artificial intelligence has thrust the mainland's startups into a global competition for tech talent. To boost recruitment efforts, IFlytek Co., which specialises in voice recognition, opened an office in Silicon Valley this year. Based in Hefei, Anhui province's capital, IFlytek is getting support from authorities in Guangzhou, where it's just opened its South China headquarters; the city offers tens of millions of yuan to support R&D projects set up by graduates with Ph.D.s from top universities around the world. "If the government provides human resource subsidies that can help reduce the burden on enterprises and make it easier to lure talent, this allows us to move even more quickly with our R&D," says Du Lan, a senior vice president at IFlytek.

Ironically, Guangzhou may benefit from the larger role that state-owned enterprises play in the local economy: They account for 40 percent of the city's industrial assets, compared with just 17 percent in Shenzhen, a Pearl River Delta city that's become a tech hub, according to Bloomberg Intelligence estimates. Xi wants state companies to become "bigger and stronger," as reiterated in the 19th Party Congress. To upgrade its SOEs, Guangzhou is encouraging them to enter into ventures with private companies, so they can tap into their technical know-how. IFlytek, for instance, is collaborating with Guangzhou Pharmaceutical Holdings Ltd., a more than century-old company, on a network of health centres that will rely partly on artificial intelligence for diagnosis and treatment.

Midea Group Co., a privately owned maker of appliances that this year acquired German robot maker Kuka AG for $4 billion, is also cooperating with Guangzhou Pharmaceutical. "We will first introduce fully automated drugstores where medicines can be picked and sorted all by machines," said Midea Chairman and CEO Paul Fang in an interview with Bloomberg Television. "Everything we do today, from industrial automation to robot making, all closely link to AI. More and more AI technologies have been and will be used in our business and products."

The plans of Guangzhou and other Chinese cities to dominate emerging industries could go awry, if no-strings-attached financial support leads to the same overcapacity problems that devastated the global solar panel industry years earlier. Solar panel prices have fallen more than 70 percent since 2010, according to the Solar Energy Industries Association. Companies such as Suniva Inc. in the U.S. and SolarWorld AG in Germany cited competition from low-cost Chinese rivals as the main reason they were forced to file for bankruptcy this year.

Already at least 98 billion yuan in investments in electric-car factories have been announced, raising China's annual capacity to 2.9 million units—six times the number of plug-ins sold in the country last year, according to data compiled by Bloomberg. Says CSIS's Kennedy: "The worry that people have is China Inc. on steroids is going to kill profits, not only for companies but for industries as a whole." *—Dexter Roberts, with Tom Mackenzie, Haze Fan, and Rachel Chang*

▲ Readying the single-passenger EHang 184 for a test flight

QILAI SHEN/BLOOMBERG

THE BOTTOM LINE The city of Guangzhou and its surroundings are becoming a test bed for President Xi's ambitious industrial policy.

Just Don't Call Them Trailers

● Many left homeless by storms can't afford the models the industry is peddling

Hurricane victims emerging from ravaged trailer parks are discovering that the U.S. mobile home market has left them behind. In Florida and Texas, buyers looking to rebuild their lives after hurricanes Harvey and Irma are swarming dealerships, but many leave disappointed.

The industry, led by Warren Buffett's Clayton Homes Inc., is peddling such pricey interior-designer touches as breakfast bars and his-and-her bathroom sinks. These extras, plus manufacturers' increased costs for labour and materials, have pushed average prices for new double-wides up more than 20 percent in five years, making them too expensive for many of the newly homeless.

Judy Goff, a hardware store clerk whose circa 1975 double-wide in Naples, Fla., was blown to bits by Irma, pulled into a LeeCorp Homes Inc. sales lot in October and wandered through models with kitchen islands and vaulted ceilings. In the salesman's office, she got the total price, including a carport, taxes, and removal of her destroyed trailer: $140,000. She was only insured for $28,000. "I don't have that kind of money," says Goff, 73, as she stands amid the wreckage of her old home, whose walls and ceiling were stripped away, leaving her leather furniture and a lifetime of possessions to bake in the sun. "That was all I had."

About 22 million Americans live in "manufactured homes," a classification that dates to 1976, when federal law set standards for what used to be called mobile homes. Sales of new units are growing 15 percent annually as the base of buyers expands from rural areas to suburbs and retirement enclaves. Tile backsplashes and kitchen pantries fatten profits and attract buyers who couldn't afford similar extravagances in conventional houses. The industry, which makes 80 percent of new homes that sell for less than $150,000, was struggling to keep up with demand even before the hurricanes. Manufacturers that closed plants after the housing crash say they're having difficulty adding capacity because of a shortage of skilled labour. Dealerships such as LeeCorp, among the biggest in southwestern Florida, have backlogs as long as six months.

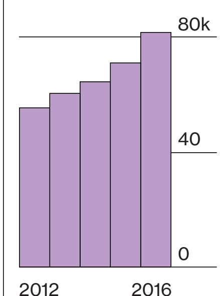
"I get that higher-end countertops and kitchen islands are where the better margins are, but that's also going to put homes out of reach for a lot of buyers," says Doug Ryan, director of affordable homeownership at the Washington nonprofit Prosperity Now. "The storm is revealing a whole lot of problems in the low-cost housing market."

Irma and Harvey damaged almost 1.8 million homes, causing uninsured flood losses of as much as $57 billion, according to CoreLogic Inc., a real estate data firm. At homeless shelters in the Naples area, the waiting list for beds has doubled, especially for single mothers and their children, many of whom are living in tents in the woods or in cars, says Vann Ellison, chief executive officer of St. Matthew's House, a nonprofit focused on the homeless. "When their properties are damaged in a place like this, it's next to impossible to bounce back," he says. Many have had to walk away from damaged mobile homes they can't repair or replace, Ellison says.

Phil Lee, the 74-year-old founder of LeeCorp, has been riding a wave of retiring baby boomers who want affordable luxury. Driving a reporter in his black BMW SUV through Bayside Estates in Fort Myers Beach, where many of the fanciest homes he sells are installed, Lee points out units with pitched roofs that look almost indistinguishable from conventional stick-built homes, facing canals with boats tied outside. Their owners, former dentists, doctors, executives, and others, spent upward of $150,000 to buy aging units just to clear the way for something more luxurious. On a palm-lined street flanked by ranks of 1970s-era trailers, Lee sees profit. "There's no end to replacing these homes," he says. "You get a hurricane in there, and it really accelerates things."

Terms like "mobile home" or "trailer" are now verboten in an industry striving to break free of its downscale origins. Buffett's Clayton Homes, which produces almost half of all new manufactured housing in the U.S. and competes with such companies as Cavco Industries Inc. and Champion Home Builders Inc., still builds lower-price units, but there's barely a sign of them on its website, which is mostly devoted to high-price models. The 2,000-square-foot Bordeaux features a separate tub and shower, a computer station, and a mud room, with prices starting at $121,000 and ranging as high as $238,000, not including delivery and installation costs. Clayton declined to comment.

● Production of manufactured homes



◀ LeeCorp, a dealer in southwestern Florida, has a long backlog on manufactured homes

SCOTT MCINTYRE/BLOOMBERG (2); DATA: INSTITUTE FOR BUILDING TECHNOLOGY AND SAFETY

▲ Goff's double-wide in Naples, Fla., was destroyed by Irma

While the cost of manufactured homes has surged, pay for the bottom fifth of earners is stagnating. Even after a modest pickup over the past two years, those households have seen their average income fall 9 percent since 2000, to $12,943 in 2016, based on inflation-adjusted Census Bureau data.

Financing and insuring units can be expensive, especially for decades-old trailers that are depreciating and set up on rented land and for borrowers with poor credit. Last year, 64 percent were purchased with high-rate loans, compared with just 7.2 percent for traditional single-family homes, according to the Housing Assistance Council, a Washington nonprofit. "Consumers are not offered as much choice as in the conventional market," says Lance George, the council's research director. "This is a captive audience."

At the LeeCorp dealership in Estero, Fla., sales have surged 40 percent since Irma. Josh Hentges, a 36-year-old salesman with bags under his eyes and a couple days of stubble, says he's frequently finishing paperwork in the office late into the night. The company doesn't offer its own financing, but customers find loans from area banks. "Before the storm, one out of five people walking in were serious buyers," says Hentges. "Now, it's four out of five—people walking in have to have a house."

The single-wides at LeeCorp start in the $60,000-plus range. The most expensive double-wides, some with custom bathrooms and walk-in closets, sell for more than $250,000. The half-dozen models on the lot are staged to be alluring, with plush couches, true-crime novels, and beach-house knicknacks. The showpiece is "the Islander." Built by Florida-based Jacobsen Homes, it has quartz countertops in the kitchen, a glass and tile shower with a bench, custom cabinetry with slow-close doors, and a deck.

Goff—who just wants to replace the wrecked 1,200-square-foot trailer she bought 17 years ago for $46,000, including the cost of land—says she feels boxed in. Her mobile home community won't allow single-wide homes or older used models as replacements. And every home must have a carport. She's willing to give up such upgrades as the higher-end countertops, but that probably won't be enough. Between her Social Security check and income from her job at Ace Hardware Corp., she earns only about $23,000 a year. "I just want a home that's equal to what I had," she says. "My home was a beauty." —*Prashant Gopal, with Jeanna Smialek*

THE BOTTOM LINE Average prices for new double-wide trailers are up more than 20 percent in five years, as the industry, led by Warren Buffett's Clayton Homes, has moved upscale.

Trump's Jerusalem Policy Attracts Derision And Fury

● U.S. decision to move its embassy in Israel to Jerusalem lambasted by world leaders

Neither the Palestinian Authority president nor the head of the Coptic Church in Egypt plan to meet with U.S. Vice President Mike Pence when he visits the Middle East later this month, in protest over the U.S. declaration that Jerusalem is the capital of Israel.

President Donald Trump on Dec. 6 officially recognised Jerusalem as Israel's capital and announced he would begin moving the U.S. embassy there, despite warnings from leaders across the globe that the move would undermine peace efforts and spark violence.

"It is time to officially recognise Jerusalem as the capital of Israel," the president said in a statement from the Diplomatic Room at the White House. "This is nothing more or less than a recognition of reality. It is also the right thing to do."

Vice President Mike Pence, who will travel to the region later in the month, stood behind Trump as he spoke. Secretary of State Rex Tillerson -- who had recommended against the announcement, according to one person familiar with the deliberations -- said his department would immediately begin preparations to move the U.S. embassy.

Trump's decision, presented as being in "the pursuit of peace between Israel and the Palestinians," has been denounced across the Arab world. Members of the UN Security Council condemned the move as contradicting international law and prejudging the outcome of negotiations. Israeli Prime Minister Benjamin Netanyahu has called the decision "courageous" and "just."

Criticism of the policy emerged quickly. The Anadolu Agency said Turkish President Recep Tayyip Erdogan and French President Emmanuel Macron agreed to work together to persuade the U.S. to change its stance on Jerusalem, and PLO Executive Committee member Hanan Ashrawi said the United Nations Security Council should now move to "bring the U.S. to compliance."

British Prime Minister Theresa May criticised the move in a written statement issued by her government, calling the step "unhelpful in terms of prospects for peace in the region."

Leaders from France to Saudi Arabia warned ahead of Trump's declaration that the announcement would risk fresh violence and could bury

AFP

hopes for resolving the Israeli-Palestinian conflict.

"The Kingdom expresses its denunciation and deep regret that the administration has taken this step, as it represents a great bias against the historic and permanent rights of the Palestinian people in Jerusalem," said a statement from Saudi Arabia's royal court reported by the Saudi Press Agency.

Protests against the announcement continued for several days following the announcement in the West Bank, Gaza Strip and east Jerusalem.

The Gaza Health Ministry said Dec. 10 that four Palestinians were killed in the preceding 24 hours in clashes with Israeli soldiers or by Israeli air strikes, launched in response to rocket fire on its southern towns. Late Saturday Dec. 9, the Red Crescent reported 231 Palestinians had been injured in clashes, according to Al-Jazeera Television.

Jerusalem's status must be worked out in peace negotiations with Israel, Palestinian Foreign Minister Riad Malki said in Cairo, where he added that Palestinian Authority President Mahmoud Abbas wasn't planning to meet Pence and stressed that the peace process needed a new mediator.

Pope Tawadros II, head of the Coptic Church in Egypt also won't meet Pence because the U.S. administration decision fails to take "into consideration the feelings of millions of people," the church said on its Facebook page.

Nikki Haley, the U.S. ambassador to the UN, said that the Trump administration supports a two-state solution if agreed to by both parties, and added that an Israeli- Palestinian peace agreement is within reach.

This did little to pacify Muslims. The Hamas group, which rules the Gaza Strip and has called for a new uprising, sent out a leaflet on Dec. 9 urging Palestinians to continue to confront Israeli forces to protest the U.S. move. The militant Islamic Jihad in Gaza and other Palestinian factions in the West Bank issued similar calls.

The West Bank groups instructed Palestinian churches to ring their bells as a show of unity, and called for demonstrations in front of U.S. government buildings in the West Bank on Monday and called on Palestinians to block roads and confront Jewish settlers.

In Lebanon, army chief General Joseph Aoun instructed the military to be "on alert and prepared to react to possible repercussions of the crisis." He also said troops on the country's southern border with Israel should be prepared "to confront any Israeli aggression or any breach of security."

Dennis Ross, a former negotiator on Middle East peace talks who served three U.S. presidents, said Trump's declaration would have been better delivered in the context of a deal that offered Arabs something positive. The issue is "probably the most emotional one of all those involving Israelis and Palestinians," he told Bloomberg TV.

Palestinian Authority President Mahmoud Abbas said in Arabic in a speech following Trump's announcement that "these actions reward Israel for denying all agreements and defying international legitimacy and encouraging them to continue the policy of occupation, settlement, apartheid and ethnic cleansing."

"This will serve extremist groups that are trying to transform the conflict in our region into a religious war," he said, adding that the announcement was tantamount to a U.S. "declaration of withdrawal" from its role in the peace process.

Recognising Jerusalem as Israel's capital is provocative because the eastern sector of the city -- home to some of the holiest ancient sites in Judaism, Christianity and Islam -- is also claimed by Palestinians as the capital of a future state.

While Congress passed a law in 1995 recognising Jerusalem as Israel's capital and requiring the president to move the U.S. embassy now in Tel Aviv to the city, previous presidents avoided taking steps that could be seen as prejudging the city's final status. Presidents have consistently exercised a waiver allowing them to delay moving the embassy for national security reasons.

Trump said that in taking the step the U.S. "is not taking a position on any final status issues including the specific boundaries of Israeli sovereignty in Jerusalem."

He said the U.S. would continue to support "a two-state solution if agreed to by both sides." —*Gwen Ackerman, Lin Noueihed and Justin Sink*

THE BOTTOM LINE US President Donald Trump decided to move the U.S. embassy in Israel to Jerusalem. The policy met with immediate criticism from leaders around the world.

◀ A Palestinian youth throws stones at Israeli security forces following Donald Trump's policy announcement on Jerusalem

● Donald Trump

A World Without Merkel

● After the collapse of coalition talks, the German chancellor is looking weaker than ever

Angela Merkel used to tell Germans "we can do it" when addressing the question of integrating the million-plus refugees who have come to Germany since 2015. That pragmatic attitude and her liberal approach have–after the election of Donald Trump and his "America First" agenda–spurred many politicians and pundits to hail Germany's motherly chancellor as the de facto leader of the free world. But after a narrow election victory in September and the collapse of coalition talks on Nov. 19, it's beginning to look as if she may not be able to "do it" after all.

First elected chancellor in 2005, Merkel has been a stable presence on the global stage for so long ▶

● Angela Merkel

◀ that it's hard to imagine Germany, or Europe, without her. Following September's election, in which her conservative bloc of Christian Democrats and the Christian Social Union lost 65 seats in the Bundestag, Germany's parliament, she has struggled to assemble the jigsaw of smaller parties needed to form a majority government, proving that, for all its economic strength, Germany is vulnerable to the same forces of populism and political fragmentation that have swept other democracies in recent years.

Despite Merkel's legendary skills as a backroom negotiator, honed at countless European Union and global summits during her dozen years in power, coalition talks broke down over the vexing question of immigration as well as economic concerns—the first time since before World War II that a German election has failed to produce a government. Although there are as many ways for her to stay in power as to be forced out, and she says she's prepared for another election, a world without Merkel as chancellor has become a real possibility.

"Merkel was a historic figure as far as Europe's concerned, but her time has come and gone," says Ashoka Mody, a former World Bank economist just finishing a book about Merkel's handling of Europe's currency crisis. Even if she remains as chancellor, Merkel is now so badly weakened that she would be a different kind of leader. "Merkel mark 2 would be very different from Merkel mark 1," Mody says.

In her three terms as chancellor, Merkel, 63, steered Germany relatively unscathed through the global financial crisis and helped keep the euro intact, winning fans abroad. But her decision to embrace the flood of refugees from Syria and other troubled parts of the world cost her support at home. Germany's next chancellor—whether Merkel or someone else—will be faced with fixing a growth model that led to too much inequality, too many people feeling abandoned, and seemingly limitless immigration. The populist Alternative for Germany (AfD) won 12.6 percent in September's vote, enough to make it the first hard-right party to enter the Bundestag since the 1950s. The primary question facing the next German leader will be how to limit the AfD's rise.

Merkel's declining influence is "very bad news for the European Union," *Le Monde* wrote in a gloomy editorial on the collapse of talks in Berlin. The French daily newspaper pointed to the wider roller-coaster narrative of European populism this year. Hopes that the center might hold, raised after Emmanuel Macron won the French presidency with an unashamedly pro-Europe, liberal message, have now been "suspended," the paper wrote.

Macron had been counting on Merkel's support to secure sweeping change to the EU, proposing deeper cooperation on defense, taxes, immigration, and—crucially—a common budget for the 19-nation euro area. That's looking much more difficult as the compromises he needs from Merkel would be politically costly for any chancellor. Other than Merkel, "no one here has the grasp or the popular trust to enable Germany to make the concessions needed," says Jan Techau, director of the Richard C. Holbrooke Forum at the American Academy in Berlin. One objection the Free Democratic Party had when it walked out of coalition talks at midnight on Nov. 19 was that it wants a commitment to change EU rules so member states could exit the euro without leaving the wider bloc—a political nonstarter for Merkel.

"Merkel was a historic figure as far as Europe's concerned, but her time has come and gone."

She's also been central in corralling the EU on relations with Vladimir Putin's Russia. A Russian speaker who grew up in communist East Germany, she took the lead in persuading Austria, Greece, Italy, and other reluctant EU members to impose economic sanctions on Russia in 2014 aimed at punishing the Kremlin for its destabilization of Ukraine. The sanctions have cost both sides, and Merkel has consistently supported them as they come up for renewal every six months. Losing her voice would create "a target-rich environment for Putin" to

AFP

get them lifted without first pulling his troops and weaponry out of eastern Ukraine, says Frederick Kempe, president of the Atlantic Council, a think tank in Washington. "After Merkel we will have a more inward-looking Germany," he says. "Macron has stepped up, but let's not kid ourselves: On the economy and on geopolitical issues, nobody in Europe can fill Germany's shoes."

Merkel has earned her share of critics, and there's another way to look at the coming end of her era. Hers was "a visionless leadership," says Josef Janning, who heads the Berlin office of the European Council on Foreign Relations. For all her strength in crisis management, she has rarely led by principle or sought to shape the future. Even Merkel's decision to welcome, rather than fight, the sudden flood of refugees was a tactical calculation–there was little she could do to stop it, and Germans at first responded enthusiastically–rather than a moral choice or strategic plan, Janning says.

At international summits, Germany punched above its weight because of Merkel's perceived stability and authority. But she never committed the resources necessary to take the lead in reshaping the world, in part because she knew Germans don't want that role, Janning says. If she goes, it's unlikely anyone will pick up where she left off. The political concessions needed to keep supporting the kind of rules-based order Merkel promoted can't be made when societies are as fragmented as they are and leaders must constantly appeal to their domestic bases. After September's election, in which both of the traditionally dominant, centrist parties lost share to smaller fringe ones, that became true for Germany, too. "If Merkel is no longer around, it will just become clearer that we are actually living in a leaderless world," Janning says. And no one–not a new German leader, not Macron, not anyone else–would be able to change that. —*Marc Champion*

THE BOTTOM LINE Without Merkel's leadership, Europe may struggle to combat the forces of populism and isolationism unleashed by Brexit and the rise of Donald Trump.

Lebanon Conference Calls for More Meetings to Aid Country

● A series of meetings in Europe will attempt to foster greater stability in Lebanon

A conference held in Paris to help Lebanon ended on Dec. 10 with pledges to hold three more conferences in European cities next year to support the country's efforts to avoid being engulfed by the Middle East's conflicts.

A March conference in Paris will raise funds for building Lebanon's infrastructure and economy. A Rome meeting earlier in the year will pledge help for Lebanon's military, and a Brussels conference will raise money to help the 1.5 million Syrian refugees in Lebanon.

The Paris conference was also meant as a show of support for Lebanon's Prime Minister Saad Hariri, who this week withdrew his resignation after winning pledges from parties in his cabinet to distance themselves from wider conflicts in the Middle East. Saudi Arabia had pushed for Hariri's resignation to protest the growing influence of Iran-backed Hezbollah in the Lebanese government, analysts say.

"We note the support of the international community to the unity and integrity of Lebanon, and its desire to distance itself from regional conflicts," French Foreign Minister Jean-Yves Le Drian said. "We state our confidence in this country and in the model that it represents."

Le Drian said Lebanon's "dis-association" policy applied equally to Saudi Arabia and Iran. Friday's meeting included representatives of the five permanent members of the Security Council plus Italy, Germany, and the European Union.

Hariri said his country needed help with the refugees. "Lebanon is paying an enormous price for the world," Hariri said. "They have to eventually return home, but it has to be when their security is ensured. In the meantime we have to help them, but we need your help."

Hariri also said he wanted to see "tangible" results from the Rome conference, "not just pledges." Past promises to help the Lebanese army from Saudi Arabia and others have been put on hold because of concerns the weapons could end up in the hands of Hezbollah. — *Gregory Viscus*

● Saad Hariri

AFP

THE BOTTOM LINE A conference held in Paris aimed to promote stability in Lebanon and ended with a pledge to hold three more meetings in Europe to help the Mediterranean nation.

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50 Companies to Watch

1	2 Alaska	3 amc	4	5 BASF
6 boohoo	7	8	9 COSCO SHIPPING	10 CSX
11	12	13 DANONE	14 Discovery	15 DONG
16 DOW DUPONT	17 DSV	18 ENGIE	19	20 e
21	22 Ford	23 GAP	24	25 Hertz
26 inc	27 intu	28 JACOBS	29 KraftHeinz	30 Lundin
31	32 M	33 NAVER	34 Nintendo	35
36	37 PayPal	38	39 Q	40 RWE
41	42	43	44	45
46	47	48	49 WELLS FARGO	50 WILLIAMS SONOMA

Bloomberg Intelligence analysts identified 50 publicly traded companies—out of the 6,000 they track—worth special attention because they plan to release significant products and services in the coming year or because they face unusual challenges. To assemble the list, the analysts also considered factors such as revenue growth, profit margin, market share, and debt.

Methodology

Figures were compiled or calculated by Bloomberg's Global Data division from the most recent company and/or broker reports as of Sept. 15 unless otherwise noted. Estimated sales growth: the percentage change in sales for the next 12 months, vs. the previous 12 months, based on Bloomberg surveys of analysts. Estimated EPS growth: the percentage change in earnings per share for the next 12 months, vs. the previous 12 months, based on Bloomberg surveys of analysts. Figures are in U.S. dollars. N/M = not meaningful.

1 Advanced Micro Devices Inc.

▲18.8%	**Estimated sales growth**
N/M	**Estimated EPS growth**
$3.37b	**Total assets**
$4.62b	**12-month sales**
▲108.0%	**1-year total return**

Semiconductors

After years of disappointing products, AMD's latest and upcoming chip releases—across desktops, servers, and laptops—will determine the company's return to relevance. The chips could help AMD regain market share in 2018. Server processors are an important part of the mix and present an opportunity to gain share.

2 Alaska Air Group

▲22.9%	**Estimated sales growth**
▲9.4%	**Estimated EPS growth**
$10.72b	**Total assets**
$6.9b	**12-month sales**
▲14.3%	**1-year total return**

Airlines

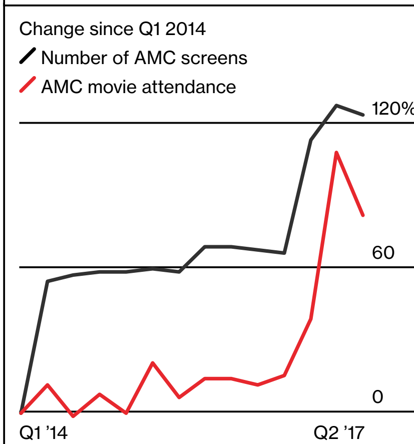
Although Alaska has offered pilots lower pay but more stable employment than rivals, its 2016 merger with Virgin America Inc. led unions to demand wages in line with other full-service carriers—as much as 20 percent above current levels. If Alaska raises prices to compensate, it could lose a prime competitive advantage.

3 AMC Entertainment Holdings Inc.

▲26.7%	**Estimated sales growth**
▼44.0%	**Estimated EPS growth**
$9.81b	**Total assets**
$4.19b	**12-month sales**
▼44.4%	**1-year total return**

Entertainment

The world's largest movie theatre operator is facing the double threats of declining audience and the Chinese crackdown on Dalian Wanda Group Co., its majority owner. AMC is betting on cost cuts to make up for lost revenue and theatre renovations to attract audiences, but it remains heavily indebted after a spree of acquisitions.

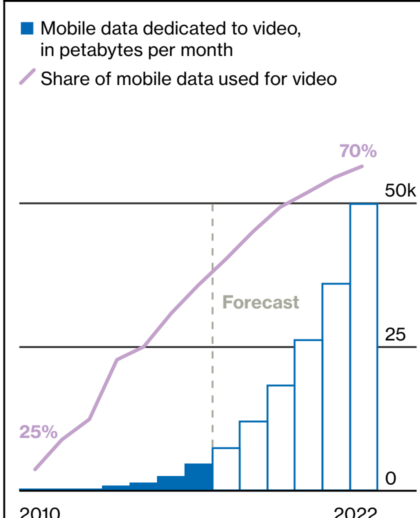


4 AT&T Inc.

▼0.3%	**Estimated sales growth**
▲2.0%	**Estimated EPS growth**
$420.8b	**Total assets**
$161.93b	**12-month sales**
▼3.7%	**1-year total return**

Telecom

With growth in the wireless market slowing, AT&T will seek to use content as an edge against its rivals. AT&T must beat a U.S. Justice Department antitrust lawsuit, which goes to court on March 19, in order to acquire Time Warner. If the deal goes ahead it will give AT&T content from HBO, Turner, and Warner Bros.



DATA: ERICSSON

COURTESY ADVANCED MICRO DEVICES (1); GETTY IMAGES (4); COURTESY AT&T (1); COURTESY ALASKA AIR GROUP (1)

5 BASF SE

▲13.5%	Estimated sales growth
▲14.3%	Estimated EPS growth
$86.34b	Total assets
$67.51b	12-month sales
▲32.3%	1-year total return

Chemicals

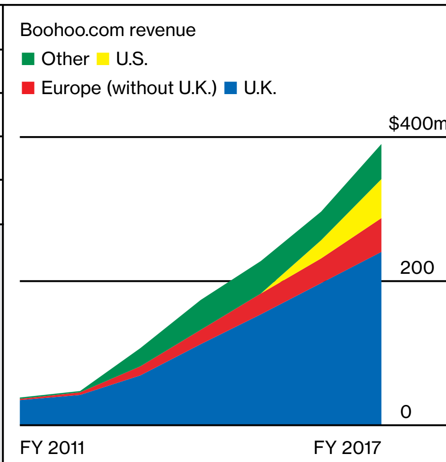
While the rest of the chemicals industry pursued transformational mergers, BASF has concentrated on smaller strategic acquisitions to help it offer higher-complexity, higher-cost products, increasing both its capacity and operating margins—a win-win.

6 Boohoo.com Plc

▲36.6%	Estimated sales growth
▲48.8%	Estimated EPS growth
$235m	Total assets
$545m	12-month sales
▲182.9%	1-year total return

E-Tail

The apparel industry's fastest-growing e-tailer is on track to see sales jump at least 80 percent this year, with new brands like PrettyLittleThing gaining traction in the company's home U.K. market and the U.S. Local sourcing gives it wider margins than those of its competitors, but logistics could become a challenge.



7 Cabot Oil & Gas Corp.

▲34.6%	Estimated sales growth
▲151.3%	Estimated EPS growth
$5.22b	Total assets
$1.58b	12-month sales
▲7.7%	1-year total return

Natural Gas

Despite productivity improvements, delays in the construction of pipelines have left Cabot unable to transport some gas for sale. Northeast infrastructure expansion should allow the company to ship natural gas from the Marcellus Shale beginning in mid-2018.

8 China Merchants Bank

N/M	Estimated sales growth
▲17.7%	Estimated EPS growth
$916.42b	Total assets
$43.91b	12-month sales
▲56.2%	1-year total return

Banking

After slow earnings growth in 2015 and 2016, China's leading retail and private bank is turning around its business thanks in part to better-quality loans and higher credit card fees. It's also enhancing its financial technology capabilities through new mobile, cloud, and blockchain apps.

9 Cosco Shipping Holdings Co.

N/M	Estimated sales growth
▲83.2%	Estimated EPS growth
$18.37b	Total assets
$12.26b	12-month sales
▲72.7%	1-year total return

Shipping

With its acquisition of Orient Overseas International Ltd., the Chinese shipping company is making a play to disrupt Europe's dominance of global shipping. The $6.3 billion deal, expected to close in the first quarter of 2018, will make Cosco the world's third-biggest carrier.

10 CSX Corp.

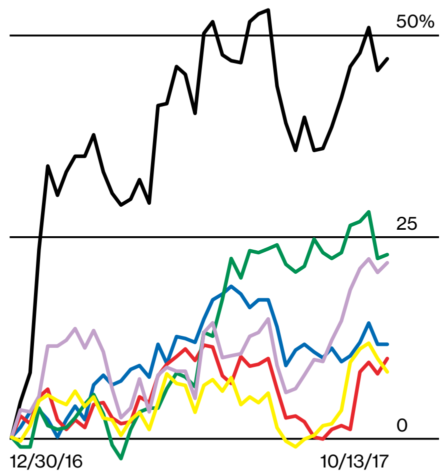
▲2.1%	**Estimated sales growth**
▲21.7%	**Estimated EPS growth**
$35.86b	**Total assets**
$11.55b	**12-month sales**
▲82.5%	**1-year total return**

Transportation

Investors are betting that legendary railroad CEO E. Hunter Harrison will be able to execute yet another turnaround. Service issues, customer complaints, and regulatory scrutiny have made the transition bumpy, but the faithful are optimistic about Harrison's precision scheduling strategy.

Change in share price since 12/30/16

CSX / Canadian National Railway / Canadian Pacific Railway / Kansas City Southern / Norfolk Southern / Union Pacific



11 Cypress Semiconductor Corp.

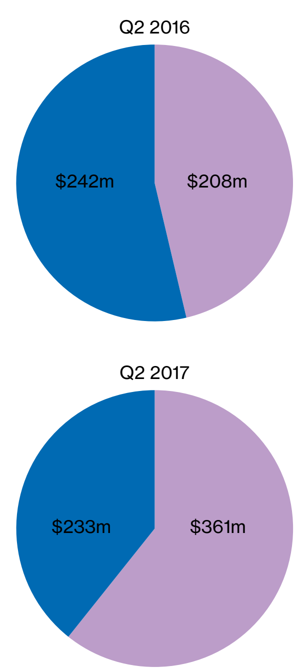
▲10.6%	**Estimated sales growth**
▲65.0%	**Estimated EPS growth**
$3.74b	**Total assets**
$2.19b	**12-month sales**
▲25.7%	**1-year total return**

Semiconductors

The chipmaker is in the early stages of turning away from the declining memory-based business to become a major player in the internet of things. Sales in that space are expected to increase 20 percent this year, with even greater potential for growth next year as the smart-home market continues to expand.

Cypress Semiconductor revenue

- Microcontroller and connectivity division
- Memory products division



12 Dangote Cement Plc

▲4.6%	**Estimated sales growth**
▲5.0%	**Estimated EPS growth**
$5.2b	**Total assets**
$2.35b	**12-month sales**
▲7.9%	**1-year total return**

Manufacturing

Dangote is poised to make the most out of double-digit housing and infrastructure growth in sub-Saharan Africa. Already Nigeria's largest cement maker, it's aiming to extend its business into Sierra Leone, Tanzania, and Congo.

13 Danone SA

▲23.3%	**Estimated sales growth**
▲22.6%	**Estimated EPS growth**
$52.12b	**Total assets**
$25.11b	**12-month sales**
▲13.3%	**1-year total return**

Food Products

Danone's acquisition of WhiteWave Foods Co., parent company of Silk nondairy and Horizon Organic milks, should help bolster the French company's core dairy business. With the retirement of Chairman Franck Riboud, CEO and now-Chairman Emmanual Faber faces increased pressure to deliver.

14 Discovery Communications Inc.

▲7.9%	Estimated sales growth
▲18.5%	Estimated EPS growth
$16.15b	Total assets
$6.59b	12-month sales
▼10.1%	1-year total return

Entertainment

In a bid to stanch subscriber losses, the edutainment company reached an agreement to acquire lifestyle-focused Scripps Networks Interactive Inc. earlier this year. When that deal closes in early 2018, Discovery will become a powerhouse in unscripted programming.

New CEOs to Watch

22 **Ford Motor Co.**'s Jim Hackett is a relative newbie to his industry, and 10 **CSX Corp.**'s E. Hunter Harrison is a seasoned insider, but each faces the same challenge: steadying a flailing business. **Ralph Lauren Corp.**'s Patrice Louvet is the company's second new CEO in as many years and will attempt a total revamp to appeal to younger customers who shop online. And after replacing Jim Reid-Anderson as **Six Flags Entertainment Corp.** CEO in early 2016, John Duffey abruptly stepped down this July—to be replaced by a returning Reid-Anderson.

Hackett

Harrison

Louvet

Reid-Anderson

15 Dong Energy A/S

▲14.1%	Estimated sales growth
▼2.3%	Estimated EPS growth
$20.5b	Total assets
$9.16b	12-month sales
▲34.6%	1-year total return

Energy

After selling its exploration and production assets and shifting from fossil fuels to renewables, Danish Oil & Natural Gas is changing its name to Orsted, after the physicist who discovered electromagnetism. It's counting on the offshore wind market, where it's already a leader.

16 DowDuPont Inc.

N/M	Estimated sales growth
N/M	Estimated EPS growth
$163.46b	Total assets
N/M	12-month sales
▲37.3%	1-year total return

Chemicals

Two years after it was announced, the Dow-DuPont merger is finally complete, and the chemicals behemoth can start breaking itself up. In a nod to investors' concern over inefficiencies, one unit will focus on materials science, another on agriculture, and a third on specialty products.

17 DSV A/S

▲16.7%	Estimated sales growth
▲35.1%	Estimated EPS growth
$6.14b	Total assets
$10.54b	12-month sales
▲49.1%	1-year total return

Logistics

A year and a half after absorbing the large but inefficient UTi Worldwide Inc., transport company DSV has managed to restore and even surpass its previous operating margins. Its share price and earnings are soaring, and DSV is on the hunt for another $1 billion-plus acquisition.

GETTY IMAGES (7); AP IMAGES (1); COURTESY DSV (1)

18 Engie SA

▲6.9%	Estimated sales growth
▲5.0%	Estimated EPS growth
$166.84b	Total assets
$72.0b	12-month sales
▲19.9%	1-year total return

Energy

The French energy giant has been shifting away from fossil fuel assets and toward renewables, investing in wind and solar. So far the market has responded favorably, especially as new French President Emmanuel Macron affirms his commitment to green-energy development.

19 Eni SpA

▲16.3%	Estimated sales growth
▲124.3%	Estimated EPS growth
$134.47b	Total assets
$68.13b	12-month sales
▲17.7%	1-year total return

Energy

The Italian oil company's "dual exploration" strategy—solo discovery followed by shared development—has made it one of the few majors to both save cash and raise output. Its latest offshore site, the Zohr field off Egypt's coast, will start producing at the end of this year, a record-fast 22 months after discovery.

20 Experian Plc

▲9.5%	Estimated sales growth
▲13.1%	Estimated EPS growth
$7.69b	Total assets
$4.34b	12-month sales
▼1.9%	1-year total return

Business Services

With greater attention on credit reporting after the massive Equifax hack, Experian and its peer, TransUnion, are facing the potential for increased regulation. Calls for free security freezes and more access to credit reports could limit their ability to sell credit-monitoring services.

21 Fannie Mae

N/M	Estimated sales growth
N/M	Estimated EPS growth
$3.31t	Total assets
$111.89b	12-month sales
▲60.6%	1-year total return

Freddie Mac

N/M	Estimated sales growth
N/M	Estimated EPS growth
$2.02t	Total assets
$71.76b	12-month sales
▲58.8%	1-year total return

Financials

After years of funneling profits to the U.S. Department of the Treasury, the two government-sponsored mortgage backers will be forced to operate with a net worth of zero beginning in 2018. Even a small loss would require them to go back to Treasury and again borrow from taxpayers—a political disaster.

22 Ford Motor Co.

▼0.1%	Estimated sales growth
▲5.9%	Estimated EPS growth
$247.47b	Total assets
$142.94b	12-month sales
▲1.3%	1-year total return

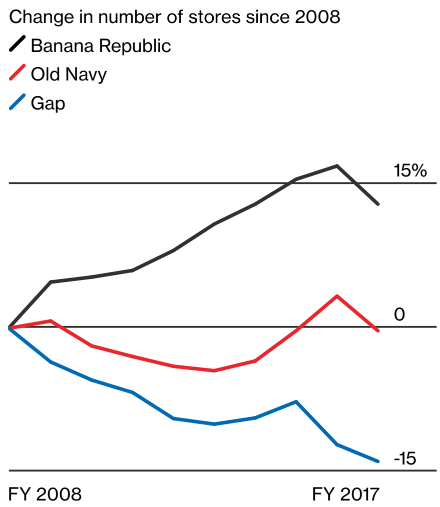
Automobiles

New CEO Jim Hackett will have to bring the venerable automaker up to speed on electric and autonomous vehicle development or face an investor revolt. Third-quarter earnings benefited from a boost in sales after recent hurricanes damaged vehicles, yet full-year profit is expected to decline.

GETTY IMAGES (4); COURTESY ENGIE (1)

23 Gap Inc.

▲0.9%	Estimated sales growth
▲2.3%	Estimated EPS growth
$7.62b	Total assets
$15.47b	12-month sales
▲23.7%	1-year total return



Retail

The company's namesake brand has struggled to return to its 1990s peak, but a faster, more responsive product pipeline and fewer discounts have helped Gap rebound. With Old Navy flourishing and Athleta activewear selling briskly, a turnaround may finally be under way.

24 Great Wall Motor Co.

▲18.1%	Estimated sales growth
▲11.1%	Estimated EPS growth
$12.28b	Total assets
$14.41b	12-month sales
▲31.2%	1-year total return

Automobiles

The Chinese automaker's potential tie-up with BMW AG may be too little, too late. An earlier strategy of refusing to team up with foreign brands may have reached its limit. Although it still dominates the country's SUV market, Great Wall faces decreased market share as competitors are creeping in.

Can Retail Turn Around?

Declining foot traffic and intense pricing pressure have gutted retail in recent years. Among companies that have struggled the most, 23 **Gap Inc.** is well-positioned to start regaining strength. Others, such as **Macy's Inc.**, still have too many underperforming stores, and 2018 will likely bring another round of closures. On the bright side, Macy's owns a substantial number of its stores, so shedding real estate will produce cash flow. The store chain is counting on in-house brands—including beauty products from Bluemercury, which Macy's acquired in 2016—and the expansion of its discount Backstage outlets to attract more dollars. **L Brands Inc.** has responded less well to pressures. Strength at its younger-skewing Pink lingerie and Bath & Body Works brands hasn't helped **Victoria's Secret**: Poor sales at its stores have continued to drag down the bottom line, even after excluding the negative effect of its exit from swimwear and apparel.

25 Hertz Corp.

▲2.5%	Estimated sales growth
▲72.3%	Estimated EPS growth
$22.43b	Total assets
$8.69b	12-month sales
▼57.2%	1-year total return

Car Rental

With the brand's 2014 accounting scandal still casting a shadow over its finances, Hertz is struggling against competition from Uber Technologies Inc. and Lyft Inc., as well as automakers. The company shrank its rental car fleet this year, which helped shore up profitability even as domestic sales volume continued to fall.

26 INC Research Holdings Inc.

▲191.2%	Estimated sales growth
▲16.0%	Estimated EPS growth
$1.33b	Total assets
$1.03b	12-month sales
▲27.7%	1-year total return

Health Care

INC Research's May acquisition of InVentiv Health vaults the company from a niche developer to the industry's No. 2 contract clinical researcher. The question now is whether it can effectively integrate InVentiv's operations. Both companies grew slowly in 2017; they're counting on increased efficiencies to speed things up.

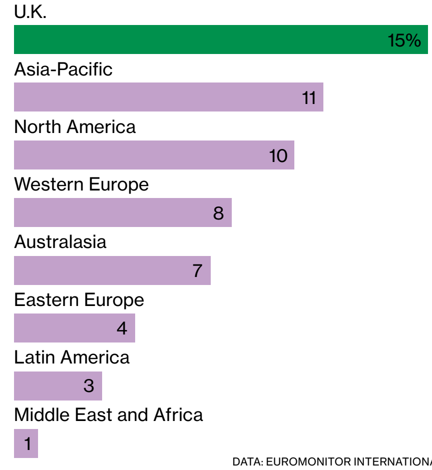
27 Intu Properties Plc

▼7.2%	Estimated sales growth
▲11.6%	Estimated EPS growth
$14.4b	Total assets
$851.2m	12-month sales
▼10.9%	1-year total return

Real Estate

As U.K. retailers faced competition from online sales, the mall operator neglected upgrading its properties so it could focus on buying more. The strategy pushed its market value down almost 40 percent below the value of its assets. A newly announced upgrade program may salvage some malls, but vacancies are likely to climb.

Internet retail as a share of the entire retail sector, 2016



DATA: EUROMONITOR INTERNATIONAL

28 Jacobs

▲6.6%	Estimated sales growth
▲12.5%	Estimated EPS growth
$7.24b	Total assets
$10b	12-month sales
▲12.5%	1-year total return

Infrastructure

The engineering company is poised for a turnaround in 2018 following three years of declining sales. Two acquisitions, of a cybersecurity company and a leading U.K. infrastructure design firm, indicate that Jacobs is trying to anticipate customers' future needs.

29 Kraft Heinz Co.

▲2.4%	Estimated sales growth
▲7.6%	Estimated EPS growth
$119.4b	Total assets
$26.1b	12-month sales
▼6.1%	1-year total return

Food & Beverage

Having wrung all the efficiencies it can from its 2015 merger with Kraft, the conglomerate is on the hunt again for sources of growth. Although it walked away from a $143 billion bid for Unilever Plc, the overture signaled that Kraft Heinz wants to diversify beyond packaged foods—and is willing to spend big to do so.

30 Lundin Petroleum AB

▲2.6%	Estimated sales growth
N/M	Estimated EPS growth
$5.11b	Total assets
$1.59b	12-month sales
▲30.3%	1-year total return

Energy

The Swedish driller focused entirely on Norway boasts lower operating costs and the best growth prospects among European independent exploration and production companies. It's an active explorer in the Barents Sea, which holds multibillion-barrel resource potential.

GETTY IMAGES (5)

31 MercadoLibre Inc.

▲54.3%	Estimated sales growth
▲9.2%	Estimated EPS growth
$1.51b	Total assets
$1.07b	12-month sales
▲62.4%	1-year total return

E-Commerce

The so-called Amazon of South America had to stretch this year to begin offering free shipping in Brazil, Chile, Colombia, and Mexico, hoping the incentive would boost e-commerce. Early signs point to success, but the investment and new competition from Amazon mean margins will get worse before they get better.

32 Motor Oil Hellas

▲8.6%	Estimated sales growth
▼25.4%	Estimated EPS growth
$3.25b	Total assets
$8.11b	12-month sales
▲125.8%	1-year total return

Energy

With the highest overall refinery complexity in the Mediterranean—allowing it to process cheaper heavy crude oil and giving it an above-average refining margin—the company is well-positioned to take advantage of low crude prices.

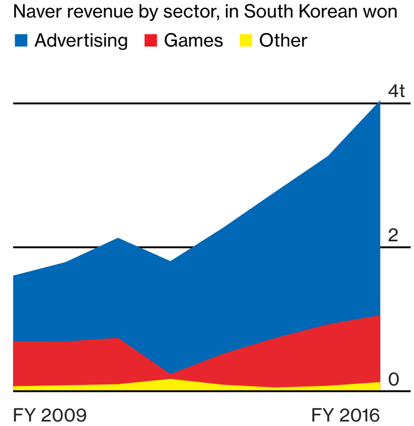
33 Naver Corp.

▲18.7%	Estimated sales growth
▲30.2%	Estimated EPS growth
$6.29b	Total assets
$3.77b	12-month sales
▼9.8%	1-year total return

Internet Media

South Korea's No. 1 internet search provider is copying chapters of Google's playbook, venturing into artificial intelligence and cloud services. These investments may hold back profit growth in the near term, but the company is betting investors will recognize their long-term potential.

Naver revenue by sector, in South Korean won



34 Nintendo Co.

▲78.8%	Estimated sales growth
▼10.0%	Estimated EPS growth
$13.1b	Total assets
$5.28b	12-month sales
▲33.2%	1-year total return

Consumer Electronics/Gaming

The Nintendo Switch gaming console is an even bigger hit than the company had hoped for, with sales on track to exceed its target of 13 million units. The success could help attract third-party game developers to the platform; more games would boost consumer interest next year.

35 Palo Alto Networks Inc.

▲25.1%	Estimated sales growth
▲26.2%	Estimated EPS growth
$3.44b	Total assets
$1.76b	12-month sales
▼3.4%	1-year total return

Cybersecurity

The growing frequency of cyberattacks has been a boon to digital security companies, and to Palo Alto Networks in particular. Its latest products integrate with users' existing software, allowing for maximum flexibility, and the company has also begun selling existing customers more add-on services.

36 Patterson-UTI Energy Inc.

▲119.4%	Estimated sales growth
▲75.7%	Estimated EPS growth
$5.4b	Total assets
$1.34b	12-month sales
▼1.6%	1-year total return

Energy

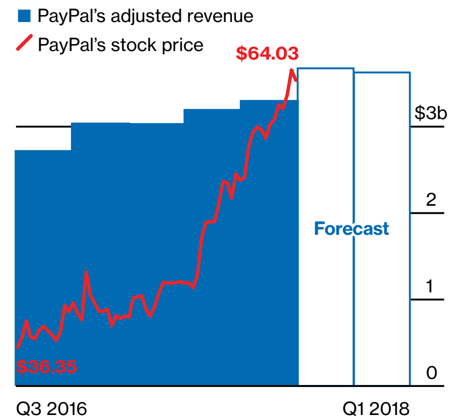
As onshore drilling margins have dropped, Patterson-UTI has responded by diversifying. Its well completion business now outperforms its active rigs, and the purchase of directional driller MS Energy Services will help the company stay competitive.

37 PayPal Holdings Inc.

▲23.4%	Estimated sales growth
▲25.2%	Estimated EPS growth
$35.29b	Total assets
$11.76b	12-month sales
▲53.1%	1-year total return

Online Payments

The original digital-payments company has forged partnerships with former frenemies, including Apple, Facebook, Google, and Samsung. PayPal usage is rising among shoppers and merchants thanks to new capabilities such as One Touch mobile payments, adding to the company's momentum.



38 PRA Health Sciences Inc.

▲24.4%	Estimated sales growth
▲32.2%	Estimated EPS growth
$2.41b	Total assets
$1.69b	12-month sales
▲38.1%	1-year total return

Health Care

Two new strategic partnerships with top-20 global pharma companies should help the contract researcher continue its five-year streak of double-digit growth. A growing order backlog shows PRA still has plenty of room to expand.

39 Qualcomm Inc.

▼2.9%	Estimated sales growth
▼24.7%	Estimated EPS growth
$64.37b	Total assets
$23.44b	12-month sales
▼13.3%	1-year total return

Semiconductors

With its core technology-licensing business under fire from Apple Inc. and regulators, the company filed a countersuit against the iPhone maker in a Chinese patent court. Apple and others have already stopped paying the company, meaning Qualcomm faces an existential threat to its royalty business model.

40 RWE AG

▲11.9%	Estimated sales growth
▲21.1%	Estimated EPS growth
$86.09b	Total assets
$49.18b	12-month sales
▲47.1%	1-year total return

Utilities

The German utility got a boost this year from recovering coal prices. But an expected increase in Chinese coal production, resulting from a decline in global prices, will put more pressure on the company and other European power providers.

GETTY IMAGES (5); COURTESY PAYPAL (1); COURTESY SEAGATE TECHNOLOGY (1)

Tech Litigation to Watch

39 **Qualcomm Inc.** isn't the only company embroiled in high-stakes legal battles

Western Digital vs. Toshiba	**Western Digital Corp.** spent the better part of 2017 trying to prevent a sale of **Toshiba Corp.**'s memory chip unit. In several pending legal actions—lawsuits and arbitration proceedings—it's claiming that a sale would violate a series of agreements underlying a joint venture between WD's SanDisk subsidiary and Toshiba. Toshiba plans to sell its flash memory unit to a consortium led by **Bain Capital LP** for about $18 billion, hoping the sale will offset massive losses in its U.S. nuclear division. The company must complete the deal by March 2018 to avoid being delisted from the Tokyo Stock Exchange. The various cases likely won't hold up the sale, but they could reduce the price by 5 percent if a court decides that Toshiba must exclude the SanDisk joint venture from the deal.
BlackBerry vs. Nokia	**BlackBerry Ltd.** sued **Nokia Oyj** in federal court in February, alleging infringement of 11 patents covering key innovations in LTE wireless technologies. Nokia, BlackBerry says, has unlawfully incorporated the technology in base station products used by **T-Mobile U.S. Inc.** and **AT&T Inc.** for their LTE networks. BlackBerry isn't seeking to block use of the patents—it just wants to be paid for them. Under Chief Executive Officer John Chen, the Canadian company is focusing on patent licensing after moving away from hardware and device sales. The outcome of these actions could affect the strength of BlackBerry's licensing business, which posted $56 million in revenue in the second quarter—a little less than 24 percent of its total.

41 Seagate Technology Plc

▼6.9%	Estimated sales growth
▼8.6%	Estimated EPS growth
$9.26b	Total assets
$10.77b	12-month sales
▼2.1%	1-year total return

Hardware

Rapid changes in the data storage world have led Seagate to scale back sales of smaller, less profitable hard drives and focus on high-capacity, non-PC enterprise drives. Substantial cost-cutting and stock buybacks are helping earnings-per-share growth, but sales are under threat from solid-state drives.

42 China Shenhua Energy Co.

▲3.3%	Estimated sales growth
▼6.5%	Estimated EPS growth
$90.5b	Total assets
$33.0b	12-month sales
▲59.2%	1-year total return

Energy

Shenhua's merger with China Guodian Corp.—the consolidation of the country's two largest coal and power producers—stands to boost efficiency and reduce earnings volatility. With pollution an increasing concern for the Chinese government, Shenhua is also investing in noncoal businesses.

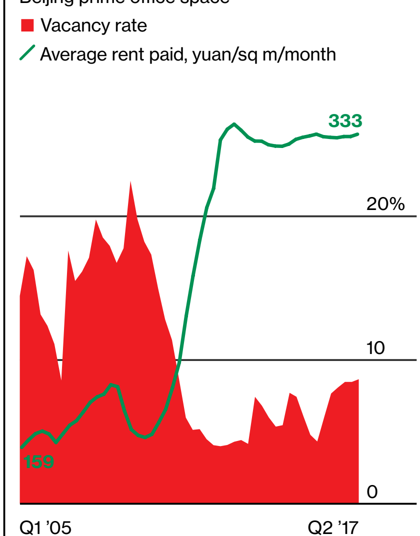
43 Soho China Ltd.

▲9.7%	Estimated sales growth
N/M	Estimated EPS growth
$10.9b	Total assets
$281m	12-month sales
▲23.6%	1-year total return

Real Estate

Responding to the weak outlook for its traditional office leasing business, this Chinese landlord announced in August that it would start expanding its co-working spaces beyond Beijing and Shanghai.

Beijing prime office space



DATA: COLLIERS INTERNATIONAL, COMPILED BY BLOOMBERG

44 Spark Therapeutics Inc.

▲268.7%	Estimated sales growth
▲11.2%	Estimated EPS growth
$276.6m	Total assets
$20.36m	12-month sales
▲31.6%	1-year total return

Biotechnology

The drugmaker is expected to receive the U.S. Food and Drug Administration's first-ever approval for a gene therapy drug, Luxturna, which treats a hereditary retinal disorder. Although the medication is Spark's first product, the company's management has ample experience in therapies for rare diseases.

45 Stericycle Inc.

▲1.6%	Estimated sales growth
▲5.5%	Estimated EPS growth
$7.04b	Total assets
$3.61b	12-month sales
▼11.8%	1-year total return

Waste Management

Although cash flow is strong for the world's leading medical waste disposal business, debt remains a problem after its acquisition of the document destruction company Shred-it two years ago. That, plus pricing pressure from competitors, led the company to project five-year growth below its typical double-digit rates.

46 Telstra Corp.

▲9.9%	Estimated sales growth
▲6.9%	Estimated EPS growth
$32.3b	Total assets
$21.3b	12-month sales
▼13.6%	1-year total return

Telecom

Australia's largest telecom company has ended its practice of paying out almost all profits as dividends, saying it will invest in technology instead. The move shows Telstra is bracing for competition, with rival TPG Telecom Ltd. entering the wireless market and state-owned NBN Co. taking over Australia's fixed-broadband network.

47 Tesla Inc.

▲75.5%	Estimated sales growth
▲19.9%	Estimated EPS growth
$26.04b	Total assets
$10.06b	12-month sales
▲89.5%	1-year total return

Automobiles

The much anticipated Model 3 missed third-quarter production estimates by a wide margin. When sweeping layoffs followed in October, the company said they were unrelated to business. CEO Elon Musk has promised improvements, and Tesla's market value is still in the range of General Motors Co.'s.

48 United Technologies Corp.

▲5.7%	Estimated sales growth
▲1.9%	Estimated EPS growth
$94.8b	Total assets
$58.3b	12-month sales
▲12.7%	1-year total return

Aerospace

United Technologies' pending $30 billion acquisition of Rockwell Collins Inc. will create the world's largest aerospace supplier, giving the company increased scale and pricing power. That will be key to protecting its profitability as Airbus SE and Boeing Co. pressure United Technologies' supply chain.

49 Wells Fargo & Co.

▲1.3%	Estimated sales growth
▲5.8%	Estimated EPS growth
$1.93t	Total assets
$90.16b	12-month sales
▲15.3%	1-year total return

Banking

Wells Fargo tried to move beyond the 2016 fake accounts scandal by restructuring its retail banking division and offering an effectively bottomless pool of damage payments to customers whose credit suffered. Revenue growth and cost-cutting should help stabilise the business next year.

GETTY IMAGES (10)

50 Williams-Sonoma Inc.

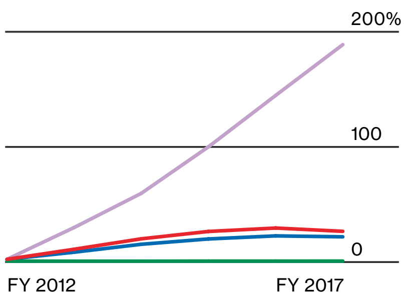
▲4.0%	**Estimated sales growth**
▲8.1%	**Estimated EPS growth**
$2.48b	**Total assets**
$5.1b	**12-month sales**
▲2.1%	**1-year total return**

Retail

Although it's fending off increased competition from online retailers including Wayfair Inc., West Elm continues to be the high performer in Williams-Sonoma's stable of lifestyle brands. The furniture brand introduced design services this year and is continuing its push into the commercial and hospitality markets.

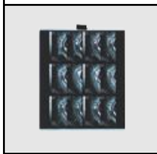
Change in revenue

West Elm / Pottery Barn / Pottery Barn Kids / Williams-Sonoma



IPOs to Watch

❶ Healthineers



Siemens AG confirmed earlier this year that it would wait until 2018 for a public listing of its health-care business, known as Healthineers. At the time of the original announcement in March 2016, a Bloomberg Intelligence analysis valued the IPO at €30 billion to €40 billion ($32 billion to $42 billion). Healthineers, which makes medical imaging equipment, is one of Siemens's most profitable divisions.

❷ Saudi Aramco

The expected largest IPO ever, announced in 2016, has been thrown off course by leadership changes at Saudi Arabia's state-owned oil company. In mid-October, the nation's oil minister reassured potential investors that plans were "on track" to list close to 5 percent of the company simultaneously in Riyadh and an international market in the second half of 2018, which could raise $100 billion, by one estimate.

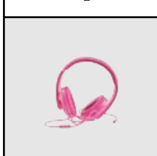
❸ Deutsche Asset Management Inc.

After a rocky 2016 that saw investors questioning the bank's financial strength and included a $7.2 billion settlement with the U.S. Department of Justice over its pre-recession dealings in mortgage-backed securities, Deutsche Bank AG is back to raising capital. Part of its plan involves an IPO of its asset management division, which has performed well even as the rest of the company has struggled. Analysts expect the listing to come in the first half of 2018.

❹ Airbnb Inc.

Among the many 2018 IPOs expected from Silicon Valley "unicorns"—including Dropbox, Uber, Palantir, and Slack—and New York-based cousin BuzzFeed, Airbnb's offering is the most likely to be successful. Although it hit some roadblocks thrown up by the hotel industry and housing regulators, Airbnb has begun to expand globally, particularly in Asia and Latin America. In early 2017, CEO Brian Chesky said the company was about "halfway through ... as far as being ready to go public."

❺ Spotify Ltd.



Stock in the Swedish music streaming behemoth is expected to start trading in 2018, but investors may not see an IPO. Spotify has been discussing plans with the U.S. Securities and Exchange Commission to list directly on the New York Stock Exchange. The company would transfer its existing shares, now held by executives, private investors, and employees, to the exchange, rather than creating new ones to sell to the public. The move wouldn't raise any money, but with 60 million paying subscribers, Spotify has plenty of cash, and a direct listing, unlike an IPO, would allow current owners to sell their stock immediately.

Just A

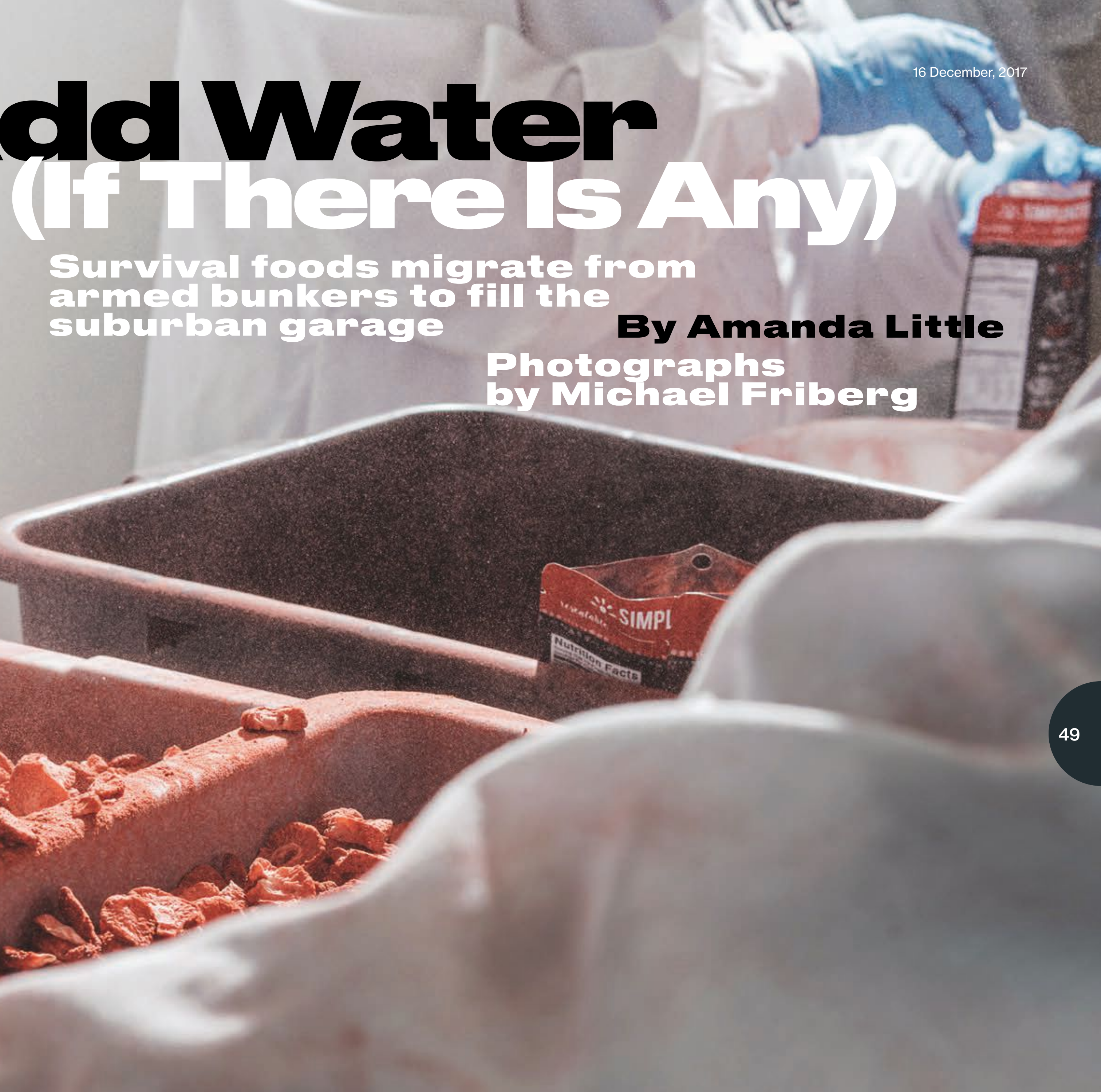
Packing dehydrated strawberries at the Wise plant in Salt Lake City

dd Water (If There Is Any)

Survival foods migrate from armed bunkers to fill the suburban garage

By Amanda Little

Photographs by Michael Friberg



On Monday, Sept. 25, five days after Hurricane Maria pounded Puerto Rico, Aaron Jackson got a LinkedIn notification on his phone from Michael Lee, supply chain and inventory manager for the Federal Emergency Management Agency. “Contact me right away,” it read, followed by a number. Jackson was at Blue Lemon, a fast-casual restaurant in Sandy, Utah, outside Salt Lake City, eating dinner with his family. He stepped outside and dialed.

Lee needed help, fast: FEMA was running low on food rations. In the previous four weeks, the agency had supplied millions of meals to the Texans and South Floridians displaced by hurricanes Harvey and Irma. Maria had created a third disaster zone with more complex logistics, having knocked out Puerto Rico’s electricity, gutted its roads, and destroyed its markets and ports. Restoring food security on the island could take months. Lee had to procure millions of servings of just-add-water meals to sustain the victims. Could Jackson provide at least 2 million and begin deliveries immediately?

Jackson is the 42-year-old chief executive officer of Wise Co., a leading brand in survival foods, that is, Mylar pouches of freeze-dried meals such as Savory Stroganoff and Loaded Baked Potato Casserole designed to remain edible on shelves for a quarter century. Over the past several years, the prepper phenomenon—people geared for imminent disaster—has come out of the backwoods via shows like the National Geographic Channel’s *Doomsday Prepper* and media reports of the very rich and very worried buying and fortifying luxury bunkers. Jackson’s ▶

Wise emergency supply tubs, ready to ship

◀ been positioning Wise to feed the trend. During the call, he felt a rush of conflicting emotions—not so much from the prospect of getting a fat government contract while legions of people suffer, but because the windfall could derail his business strategy. A 2-million-serving order will increase his sales for 2017 about 15 percent but stretch his supply more than he's comfortable with; his answer to Lee was not an easy yes.

Jackson has filled many emergency orders, including supplies for Ebola victims in Liberia and for people in the Philippines devastated by 2013's earthquake. Carnival Cruise Line has stocked Wise pouches at its Caribbean ports to feed employees when storms rock the region. Just a few days before the FEMA call, the Salvation Army purchased 100,000 servings of Wise products for Florida shelters near areas affected by Hurricane Irma.

But these last-minute orders aren't how Jackson wants to define his core business. Since 2013, when he came on as CEO, he's been trying to move the company beyond the volatile disaster-response industry. "I'm not going to turn down an incredible opportunity," he says, "but I'm also not after sporadic clients. I want predictability. I want Mr. and Mrs. Smith in Everytown U.S.A. The Walmarts, the Home Depots—those are my golden geese. If a big order from FEMA interrupts our supply to staple customers, that's a risk I shouldn't take."

For someone working in an industry defined by worst-case-scenario extremism, Jackson is notably moderate in appearance and philosophy. Tall, tidy, and well-coiffed, he looks like Clark Kent—but a Kent who'd be content never to don his cape and is facing middle-age metabolic slowdown. When I meet him at Wise's headquarters in Salt Lake City, he's wearing a quilted jacket, pressed khakis, and polished shoes that match his belt. He drives a BMW 5 Series sedan and looks like a man who's comfortable on a golf course, which he is, having played competitively in his youth.

Jackson's lived in Utah since high school, when his family moved there from a suburb of Los Angeles. After graduating from the University of Utah, he spent the first 15 years of his career selling chicken nuggets and Honey Bunches of Oats, among other kitchen-table icons, first at Tyson Foods Inc., where he specialised in frozen cutlet products, and then at Post Consumer Brands cereals, where he became a vice president for sales and marketing. Now he's relying on his corporate experience to suburbanise survivalism—a goal that seems at once respectable, preposterous, and, suddenly, attainable.

Jackson first connected with Wise in 2012, when a headhunter tried to recruit him from Post to run the fast-growing startup. He declined the offer, but commenced some research. "My aha! came in mid-2012 when I read that more than half of American homes have first-aid kits on hand, along with fire extinguishers and flashlights. I realised then they haven't added the food component. I saw incredible growth potential." When the headhunter extended the offer again a few months later, Jackson accepted the job of CEO and cautiously started to shift the marketing focus to his ideal customer, one who looks less like Ted Kaczynski and more like himself, his wife, who's an attorney, and their two tweens: someone who isn't entirely convinced that humanity is hurtling toward annihilation but who's willing to stock the pantry with a Mylar-fortified food supply just in case. "This is the food equivalent of life insurance—staples that every American household in this age of uncertainty should have," he says.

Jackson hired a young designer who'd been at the surf company Quiksilver to revamp the packaging. "We'd been selling our products in large, black plastic tubs. We needed something that doesn't scream doomsday, so we moved to clean white boxes, contemporary fonts, high-quality food images—packaging that makes sense on a Target shelf," Jackson says. As orders came in from big-box stores, he added a manufacturing facility a 15-minute drive from the office (production had previously been outsourced) that can produce 25 million pouches a year.

In the past four months, the spate of natural disasters combined with the spectre of nuclear war with North Korea has pushed up Wise's total sales 40 percent from the previous four-month period. Concerned suburbanites as well as disaster responders have contributed to the increase. The factory has made it possible for Jackson to meet both sudden surges and steady growth in demand. He ultimately managed to ship the 2 million servings to FEMA in a matter of weeks, with only a brief disruption to his regular customers' supply.

In four years, Wise's annual retail sales have more than doubled, to about $75 million. Using his network of former clients, Jackson persuaded Wal-Mart Stores, Target, Home Depot, and Bed Bath & Beyond to carry Wise products. In 2014 he also persuaded Home Shopping Network to feature the company's wares; the TV network has become its biggest distributor. But at this point, only 2 percent of Americans have bought into survival foods, according to industry analysis. Wise's two main competitors, Emergency Essentials LLC and Mountain House are, like all companies in the industry, privately held and don't report sales data, but Jackson estimates that survival food sales total about $400 million annually. Jackson sees the survival food industry today where the organics industry was in the 1950s before Americans got nervous about pesticides—poised to explode. Still, Darren Seifer, a food and beverage analyst at NPD Group, cautions the industry could just as easily "remain on the fringe, gathering dust on pantry shelves."

The pot-pie room at Wise's factory in downtown Salt Lake City is a large space with white walls and cement floors, filled with stainless-steel equipment. Machines hum and chuff as conveyors move materials between them. A funnel the size of a back-alley dumpster dominates the room, drawing the eye like an industrial interpretation of Marcel Duchamp's *Fountain*. Inside it is a grayish blend of freeze-dried potato chunks, carrot pieces, celery and onion slivers, peas, and whey protein.

When no one's looking, I dig my gloved hands into the pallid, pebbly stuff, sifting through it like a pile of shells at the beach. It's oddly weightless—hundreds of gallons of vegetables with the heft of confetti. The mixture slowly flows down from the funnel base through a chute to another device that weighs and divides it. The portions then travel to a machine emitting clouds of beige powder as it dispenses shots of dehydrated milk, celery salt, powdered garlic, and chicken bouillon. The seasoned kibble is then deposited and sealed, one 7-ounce portion every few seconds, inside Mylar bags along with pods of oxygen-absorbing sachets of iron filings, clay, and salt. The bags are labeled, "chicken flavored pot pie."

This is the first stop on my tour with Jackson through half a dozen rooms. We also visit the "hearty tortilla soup" and "maple pancake breakfast" rooms, where thousands more gold and silver Mylar pouches roll off conveyors into bins. In each room, technicians in white lab coats bring to mind Oompa Loompas as they pull levers, toggle switches, and examine packages for flaws. At one point, to demonstrate a bag's airtightness, a stocky technician in boots puts a pouch on the floor and jumps on it.

The scene evokes Willy Wonka's factory in part because the workers are achieving Wonkian ends. As a kid, I spent hours imagining the sensations of Roald Dahl's three-course chewing gum invention "made of tomato soup, roast beef and baked potato, and blueberry pie." This, too, is an attempt to create an all-in-one meal that bears little resemblance to the foods it conjures—a product that when combined with a serving of hot water simulates a home-cooked dinner.

Wiping a film of beige powder from his safety glasses, Jackson displays his range of products, from a small, 72-hour "survival kit" for $19.99, to a one-year supply for a family of four that goes for $7,999. Each serving is about 300 calories and costs less than $1—a per-calorie cost on par with prices at a McDonald's.

Jackson's technology isn't new. Wise practices a 21st century version of something the Incas started in roughly 1200 A.D., when they placed meat strips on high-altitude stone platforms to freeze overnight and then dry in the sun to make charqui, a proto-beef jerky. Modern freeze-drying methods were created during World War II to preserve blood serum so it could be shipped internationally to treat the wounded. The current processes arose in the late 1970s when concerns over the oil crisis and stagflation motivated millions of Americans to cache food.

Wise has tweaked this decades-old formula only a little: Fresh ingredients are rapidly blast-frozen at temperatures as low as -112F to prevent the formation of ice crystals that could affect food texture and nutrition. The food is then placed in a heated vacuum chamber that causes the ice to sublimate, changing directly from a solid to a gas without passing through a liquid phase. When the foods are rehydrated, pores left from the vanished ice quickly reabsorb water. The process takes almost double the energy used for canning, but can retain more than 90 percent of the food's nutrients and preserve it for far longer. The higher the fat content of a food, the faster it spoils. In pursuit of rich taste and longevity, Jackson has worked with food ▶

An employee checks sealed Mylar bags

◀ scientists to develop ingredient combinations and airtight, light-resistant packaging that extends storage times for most Wise meals to 25 years, from 7 to 15 years. Wise also sells water storage and filtration kits for rehydration in the event a household's water supply is cut off.

I first heard about Wise a few years ago from a cousin, a former police officer in Zionsville, Ind., who kept a supply of its products in his basement that could sustain his family for six months. Then my stepbrother, an executive who lives in downtown Washington, invested in a stash of drinking water and long-storage food. And my brother, a climate scientist with the Nature Conservancy, began building a supply in the basement of his West Virginia cabin. "I can't imagine anything worse than not being able to feed my kids," he says, "and the chances of disruptions in our food supply are by all accounts becoming more likely."

To me, this smacked of paranoia. My brother, cousin, and stepbrother represent a skewed sample: All are guys, all own guns, and two like to hunt in their free time with compound bows and arrows. Each possesses at least a flicker of the fatalist prepper sensibility that Wise was built in 2006 to serve. Like most survival food companies, including Emergency Essentials, Wise was founded in Utah and began marketing its products to the Mormon community preparing for the end of times, a practice encouraged by the Church of Jesus Christ of Latter-day Saints. (Jackson isn't Mormon.) But Mormons—and for that matter, male preppers—no longer represent the entirety, or even the majority, of Wise's exploding market. "Five years ago, our market was more than 95 percent men. Today, we're reaching about 50 percent women," Jackson says, "many of them moms—'guardian moms,' we call them—worried about a stable food supply for their kids."

The company's first customers a decade ago were anxious about inflation, economic collapse, and terrorist attacks; today, the major concern is environmental instability. "It's not just the freak events. We get calls from people saying, 'I live in Miami, and flooding is now routine. I'm worried Florida is going to be under water in two years,'" he says. "Or from people in upstate New York who experienced a 1-in-a-1,000-year blizzard and couldn't get out of their driveway for two weeks. People who lived through

The Survival Foods Taste Test

Three manufacturers dominate the market for foods with a shelf life of at least 25 years. We compared their takes on chili to help you decide which brand deserves a place in your bunker. ——*Kate Krader*

Product	Taste	Bowl appeal	User friendliness	Depressing factor
Wise Company Chili Mac $1.10 per serving, 240 calories The most cost-efficient of the brands, Wise specialises in starter kits. Inside are packages with appealing pictures of the food and no-nonsense directions on how to prepare it. 	Bland and slightly sweet, with a chemical-y aftertaste. The most chili-like aspect of it is the brick-red color. What looks like, but doesn't taste like, beef is textured vegetable protein; pinto beans and elbow macaroni are mushy if you cook according to package directions.	Recognisable as a saucy macaroni dish; better than it tastes.	Pour into a vessel, add boiling water, stir. Requires cleanup.	Like gloppy SpaghettiOs with different pasta.
Mountain House Chili Mac with Beef $2 per serving, 230 calories For the Burning Man survivalist set, Mountain House offers attractive packaging (happy campers around a makeshift fire) and ease. 	As if you'd brought a personal chef into your secure house. Large, al dente elbow macaroni mixed with ground beef and kidney beans in a tasty, well-spiced sauce. And it's still in good shape an hour or two later.	It could be in a commercial.	Just add boiling water to the heatproof package.	You'd be happy to eat this just about anywhere.
Emergency Essentials Chili with Beef Crumbles $3.20 per serving, 390 calories Covering all manner of products, from butter powder to shelf-stable bacon, Emergency Essentials cooking kits have a DIY focus. 	We reconstituted a separate package of beef crumbles and added it to the chili. This badly needs salt and is slightly wet, but the well-cooked kidney beans give it a solid flavour.	Like a soupy chili that might be someone's secret recipe.	More like cooking, this has to be stirred over heat for 15 minutes.	Bring salt to the apocalypse.

Dehydrated chicken in a funnel at the plant

the California drought, the forest fires of Texas and the Northwest, and who think maybe the government won't come to their rescue when a disaster hits."

When he started at Wise, Jackson's biggest concern was a lack of repeat customers: Most people, presumably, won't use up their disaster stores. The surprise has been how many of his customers return. "Up to 40 percent of my monthly sales volume is from repeat consumers," he says. Some buy the products for friends and family as gifts. He pumps up his marketing campaigns around Black Friday and, in the last two years, average monthly sales for November and December have been 20 percent higher than average monthly sales for the rest of the year. And more customers are defining their "emergency" uses of the food in new ways. "If you're a mother or father of a couple kids and you're trying to put together a meal before soccer practice–that's an emergency in its own right. They're running short on time, low on groceries, so they grab a pouch of lasagna, add water, and have a rib-sticking dinner for four in minutes."

In Miami, some colleges have to stay prepared for food disruptions because trucks are pulled off the road and students are required to stay in their dorms when winds get above 39 miles an hour. Michael Ross, resident district manager of the University of Miami's dining services, has purchased 64,000 servings of Wise products in the past three years to feed dorm-bound students. His team found Wise in 2013 at a disaster-preparedness trade show and chose the brand after taste testing it against others. Ross used to stock up on less shelf-stable fare when storms were predicted, but if the storms turned, much of the inventory would go to waste. "This we can pull out and dust off whenever we need it," he says. "The students are amazed. Many have said it's better than the food they make for themselves and ask to take it home."

Recognising the blurring of convenience and emergency, Jackson offers his same product in camping pouches and sells a line of freeze-dried snacks. This accounts for about 5 percent of Wise's products, which represent a roughly $60 million category, he says. Drafting on the post-food trend, Wise also created a nutrient-fortified protein shake. Silicon Valley's Soylent raised $25 million last year to extend the reach of its product, a just-add-water vegan powder—baby formula for adults–which has been imitated by Custom Body Fuel, People Chow, Ample Foods, and a half-dozen other new meal-replacement brands that claim to be nutritionally complete and save consumers time and money while reducing their carbon footprint. But the majority of Wise's sales remain the $129.99 black square tubs (the new packaging is catching up with old inventory) containing an advertised 13,600 calories to keep a family of four fed for a week. If you're the sole survivor, it'll last four.

At the end of my visit to Salt Lake City, I whip up a batch of rehydrated pot pie. The result is a tawny gruel. I hesitate, stifle a gag reflex, channel my inner Violet Beauregarde, and swallow. The stuff tastes pleasantly of the chicken casserole that was a staple of my childhood. But when I try to imagine consuming the contents of the Mylar pouch in the aftermath of a hurricane, or in a world torn by battles over dwindling, climate change-threatened food supplies, it's too easy. I lose my enthusiasm.

Am I succumbing to my brother's paranoia or beginning to think pragmatically? I wonder. Wildfires and hurricanes aren't the only reasons behind the spread of the survivalist mindset. According to a United Nations Intergovernmental Panel on Climate Change report, warming temperatures will reduce global agriculture yields more than 2 percent every decade, given current trends, as the world's population surges to 9 billion. Food prices could almost double by 2050. If they do, regional and international conflicts over limited affordable food would likely escalate–further increasing the odds against food security.

"This isn't about the zombie apocalypse anymore–natural disasters are the new normal," says Daisy Luther, the blogger behind the website the Organic Prepper and a survivalist in the more typical vein. She thinks we should all follow the adage, "eat what you store, store what you eat," and has guns to protect her daughters–and their stockpiles–from the lazy hordes who didn't plan ahead. "Being prepared is now just acting responsibly, especially for moms," she says. She sells freeze-dried and survival products through her online Prepper Market, but in truth, she has a touch of scorn for the parvenu Wise-buying prepper-lite. "Those just-add-water meals can work in a pinch, but they're not tasty or healthy long-term," she admonishes. "You need more than just products, you need knowledge about how to prepare and season freeze-dried foods. You need a culture of preparedness." Luther, like Jackson, sees a movement arising from the reasonable concerns of citizens who recognise that we're up against increasing environmental threats on the one hand and diminishing government safety nets on the other.

"Luck favours the prepared," Jackson says more than once during my visit. I still have yet to invest in this luck, but I've begun to consider it. I live in Nashville in a flood-prone region that was hammered by rains when Harvey swept inland. My friends and neighbours might actually welcome those 72-hour survival kits Wise promotes after Black Friday if I give them as holiday gifts. We can stuff them in the corners of our pantries and hope like hell we never have to add water. B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Great Expectations

As controversy engulfs art museums around the world, Maria Balshaw turns up the temperature at Britain's Tate galleries
By James Tarmy
Photograph by Nick Ballon

The normally staid world of museum exhibitions has been upended over the past two years by a series of protests that have made global headlines. In 2016, Greenpeace shut down an exhibition at the British Museum sponsored by BP Plc, the fossil fuel giant. In March climate activists in Paris staged dramatic protests demanding that the Louvre abandon its financial agreement with Total SA, another oil and gas behemoth.

That same month, a group of artists in New York attempted to remove a painting depicting the open casket of Emmett Till, a 14-year-old black boy who was lynched in Mississippi in 1955, from the Whitney Museum of American Art, because it was painted by a white woman. Meanwhile, anti-gay protests closed a gender-diversity exhibition at Santander Bank's cultural center in Porto Alegre, Brazil.

Call it a symptom of regional strife or simply the growing pains of an increasingly global society, but for Maria Balshaw, who became director of Britain's Tate museum in June, an energised, politically active public presents an opportunity. "The goal I have for the Tate is one where an artistic vision is held alongside, and absolutely permeates, a sense of our social mission," she says on a recent afternoon, sitting in the sixth-floor restaurant at London's Tate Modern.

The cavernous brick monolith looming over the Thames is one of two Tates in the city. Liverpool has another outpost, and St. Ives, a popular seaside retreat in Cornwall, England, has yet another, which reopened in October after an overhaul that cost £20 million ($26 million).

Balshaw, 47, has taken the helm at arguably the most fertile point in the museum's history: Last year the Tate branches together hosted 8.4 million global visitors, a figure that would represent 15 percent of the U.K.'s total population. According to an *Art Newspaper* survey, the Tate Modern is the world's most popular modern and contemporary art museum.

Now that the renovation of the Tate St. Ives, housed in a former gasworks, is complete, Balshaw is free from major capital campaigns and can devote her considerable resources to the exhibitions that she–and the public–cares about most. "We have a responsibility to balance that social, ethical, and artistic vision together," she says. The museum generally plans its programming five years in advance, and, with its various locations and £110 million budget, it's far from agile. But Balshaw's top priority doesn't need to wait: She simply wants to bring art to even more human beings. And then more after that. "By 2027, let's say, I would hope that the Tate is part of the life experience and cultural activities of a much wider demographic of people," she says. "The Tate has expanded the landscape for art in this country. Now it needs to ensure that that expanded landscape is shared with the widest community of people possible. That's the social return on the public's investment." Her bet, she says, is that a more diverse range of artists will bring in a more diverse public. "I don't think we should underestimate the curiosity in our wider audience."

Paul Owens, the director of arts consultant BOP, says Balshaw's predecessor, fundraising juggernaut Nick Serota, had a strategy that "depended on very wealthy people." He adds: "In major cities, where you have a rampaging inequality, cultural institutions are trying to answer the question: How do they address other people in society?"

Whether by accident or design, Balshaw has a résumé tailor-made for the times: Her first job after leaving academia was to research the impact of art programs in schools. After a subsequent stint as a regional director of development for the Arts Council England, she was hired as the director of the University of Manchester's Whitworth Art Gallery in 2006.

It was at the Whitworth that Balshaw began to flex her muscle, giving female artists such as Cornelia Parker huge solo shows and championing exhibitions that examined cultural conflict. She spearheaded one timed to the bicentenary of Britain's abolition of slavery, "Trade and Empire: Remembering Slavery," which combined 18th century watercolours that depicted slaves working in sugar colonies alongside contemporary pieces by black artists.

In 2011, Balshaw took on the additional role of director at the Manchester Art Gallery. There, she pushed exhibitions with

The Tate Britain

The Tate Modern

MODERN, BRITAIN, LIVERPOOL: COURTESY TATE PHOTOGRAPHY. TATE ST. IVES: HUFTON+CROW a political bent, such as a multimedia show by the conceptual artist Jeremy Deller that explored the impact of the British Industrial Revolution on popular culture. The lead image of the exhibition was possibly Deller's most famous: a 1973 photo of the glam rocker Adrian Street, covered in makeup and draped in a bejeweled cape, vamping next to his coal miner father, who wears a look of comic terror.

"She has this incredible ability to bring people and communities from all walks of life together through art," says Raqib Shaw, an artist who had a solo exhibition at the Whitworth. "Her projects are accessible, immersive, and thought-provoking."

When it was announced in January that she'd be replacing Serota, the Tate's director of three decades, it was a surprise to many in the international art world, but a logical choice to most people who knew her. "It was absolutely the most perfect progression," says Samantha Lackey, who is senior curator of programs at the Whitworth and who was hired by Balshaw.

The organisation Balshaw inherits at the Tate—with its permanent collection of more than 70,000 artworks, a staff numbering more than 900 employees, and at least a dozen exhibitions going on at any given moment—is a dramatic departure from Manchester. "It has an enormous brand," says Gail Lord, the president of Lord Cultural Resources Inc., an international consultant that's done work for the Tate. "They now have an awful lot of real estate. The real challenge will be to make it work and get significant numbers of more people engaged."

The museum was founded in the late 19th century by Henry Tate, a sugar baron who, after his donation of pre-Raphaelite art was rejected by the National Gallery, led a campaign to build a new museum for British art. He opened the first gallery, overlooking the Thames a short walk from the houses of Parliament, in 1897. When Serota took over its single building in the 1970s, through sheer force of will he raised the funds to open the Tate Liverpool (1988) and the Tate St. Ives (1993) and to purchase the derelict power station in Bankside, across the river from St. Paul's Cathedral, that would become the Tate Modern (2000). Sixteen years later he expanded that building by 60 percent with a $372 million addition. "It's important to remember that 20 years ago, London was not the centre of the art world," Balshaw says. "We just accept it as if it's always been like this."

But with that stupendous growth came the absence of anything that would ruffle the feathers of the museum's myriad supporters. Only about a third of the Tate's funding comes from the government; it generates the rest through corporate and private donations and ticket sales to special exhibitions. (Bloomberg LP, which owns *Bloomberg Businessweek*, is a major donor to the Tate.) And so, over the past decade or two, the Tate Modern has put on inoffensive blockbusters such as the exhibition of Matisse cutouts in 2014. The Tate Britain has had wild successes as well, like the recent David Hockney retrospective, seen by a record half million visitors. Another magnificent show, "Turner and the Masters," compared English Romantic painter J.M.W. Turner's art with paintings by Rembrandt, Titian, and Canaletto. This sort of programming, while popular, sparks discussion of art history rather than a raw examination of current affairs.

Balshaw's willingness to break from that model might rock the boat. But the trustees who appointed her seem to be ready for a change. Several shows, including "Queer British Art" at the Tate Britain (which closed on Oct. 1) and "Soul of a Nation: Art in the Age of Black Power" at the Tate Modern (which closed on Oct. 22), demonstrate that leadership had already begun to pivot toward more "woke" programming even before it hired Balshaw.

She's thought of some quick strategies to expand her audience. She mentions extending museum hours: "Fifteen years ago, when my children were under 5, I would have given any amount of money in the world to find somewhere that was open and had something interesting going on before 6 a.m." And she's hoping to encourage an event-based culture, citing a gay pride celebration in the context of "Queer British Art" as an example. If she can prove that a more diverse crowd wants to learn from exciting, controversial work, she expects all the museum's various supporters will get in line.

"We don't get money from the public purse just because someone fancies it," she says. "We're funded because we make a difference." Ⓑ

The Tate St. Ives

The Tate Liverpool

Lessons From Leonardo

Da Vinci died in 1519, but Walter Isaacson's biography of history's most famous creative mind is filled with information that's useful today. *By Joel Weber*

"Paper is a really cool technology for the storage of information," says Walter Isaacson, author of the definitive biographies of Steve Jobs, Albert Einstein, and Ben Franklin. Five hundred years ago, Leonardo da Vinci felt exactly the same way. From his childhood growing up as the illegitimate son of a notary to his death as an international luminary, Leonardo filled journal after journal with sketches, notes, questions, and doodles. This habit would eventually culminate in some of the most celebrated artwork ever, including the *Mona Lisa*, *The Last Supper*, and the *Vitruvian Man*. About 7,000 pages—or 25 percent—of the artist's journals still exist, and Isaacson traveled to Venice, Florence, Milan, Paris, London, and Seattle to study them. "Geeking out on them," he says, "I felt a personal connection." We spoke with the author of *Leonardo da Vinci* (Simon & Schuster, $35) about the genius's worldview and how it's still relevant to the modern reader.

BLOOMBERG PURSUITS: What drew you to Leonardo as a subject?
ISAACSON: I'm always interested in creative genius. I've come to realise that one of the secrets of creativity is to be passionately and playfully curious about a wide range of subjects. The ultimate example of that is Leonardo. He made no distinction between art and science. One of his most famous works, the *Vitruvian Man*, is partly a self-portrait, with beautiful curls and perfect shading. Leonardo's drawing has the exact proportions of the body correct. He made 230 measurements before drawing—so it's a work of staggering scientific sophistication and also a work of unnecessary beauty. Meanwhile, his peers made line drawings.

You based much of your book on Leonardo's journals, 7,000 pages of which still exist. Was there anything you came across that was truly surprising?
There's one page I write about in the book where I go over every doodle—from clouds forming, to this craggy old warrior he loved to draw, to these beautiful mountains. And at the end of the notes on that page, which he wrote in his mid-30s, there was also a recipe for tawny hair dye made by boiling nuts in oil. I realised, Here was my wonderful companion doing all these brilliant things but also worrying about having a few gray hairs. And I thought, Man, this guy is really human.

Unlike some creatives, he wasn't a recluse—he seems to have relished being part of the scene.
Leonardo was deeply appreciated during his lifetime as both an engineer and an artist. He was so comfortable with people. He loved being part of the court of the Duke of Milan, where he was surrounded by mathematicians and magicians, architects and artists. There was a rising creative class. That environment in the late 1400s was similar to the Bay Area of California in the 1970s, when they were inventing personal computers and the internet.

Speaking of today, do any modern visionaries remind you of him?
Well, there are a lot of similarities between Leonardo and Steve [Jobs]. First and foremost, they believed in connecting art and science. Beauty and design and engineering were all the same to them. Jeff Bezos cares about space travel and storytelling and artificial intelligence and retail. Like Leonardo, he shows exuberance across many fields.

That seems to be something you come back to again and again: his curiosity about everything.
One lesson to learn from Leonardo is to try to embrace many fields of knowledge and passion. Often, we fail to be creative because we think too narrowly. Leonardo would just wonder, What does a woodpecker's tongue look like? And he wanted to know, not because it would help him build a flying machine or paint a better painting, but out of curiosity. All of that eventually leads to a spiritual feel for patterns of nature. But even if it doesn't lead you to someday paint the *Mona Lisa*, it can still lead to a more enriching life.

This is the first time you've included a section in one of your biographies highlighting the lessons you can learn from your subject. Why did you do that here?
Unlike Einstein, Leonardo was not some supermind we can never try to match. He was a normal guy who procrastinates, who doesn't do math all that well, who doesn't finish projects. You can actually learn from this guy—about how to balance the business of being perfect with also being productive.

What's the most important takeaway for a business reader?
Push yourself to be more observant and understand the simplest principle in business: Beauty matters. Even the parts unseen need to be beautiful. Leonardo kept the *Mona Lisa* for 14 years knowing he could always add a brushstroke to make that smile more beautiful. If each of us, in our own lives, became a little more observant, a little more curious about the wonders of nature, and a little more committed to beauty, not only would we have better businesses, we'd have better lives.

If you could speak to Leonardo, what's the first question you'd ask?
I would actually ask him, "What's your first question for us today? What do you want to know about the future?"

ILLUSTRATION BY KATI SZILÁGYI; PHOTOGRAPH: MATT WINKELMEYER/GETTY IMAGES

Strength in Numbers

The ambitious Ionic puts Fitbit back in the smartwatch arms race. *By Jason Kelly*

Among the high-achieving, mostly urban-dwelling professionals who spend a lot of time, money, and psychic energy on endurance competitions, athletic ambitions are worn on the wrist.

That's why investment bankers and executives helped make the Timex Ironman one of the best-selling watches in the world—a Rolex communicates wealth, but that $100 digital wristwatch says you're serious about training in and out of the office. I consider myself part of this demographic, not so much for my performance level as for my willingness to spend troubling amounts of money on workout clothes, event fees, and the airline tickets to get there.

And gear. Especially gear. I've been a Fitbit user since I bought the Flex (an early model that looked like a bracelet) in 2013. I then early-adopted the Charge (a bit bulkier, but with a larger screen), and finally the Blaze, Fitbit's first real smartwatch, in January 2016. So far, I've resisted the Apple Watch. The hype is a turnoff for me, but the bigger issue is its battery life—18 hours, compared with almost five days for the Fitbit.

This fall, the San Francisco-based brand released its most ambitious gadget to date: the Ionic, a sleek watch meant to replace the bulky GPS-enabled devices marathoners obsessively check during training runs and races.

I was especially intrigued by the notion of ditching the Garmin I've worn in tandem with my Fitbit for several years. The Fitbit was my daily watch, dutifully tracking my steps and calories and sleep, but it lacked Garmin's GPS and heart-rate monitor. As a practical matter, that meant I wore one on each wrist when I was running, a look that signaled I was trying a little too hard.

A more robust smartwatch would be a nice-to-have for me, but it's a must-have for Fitbit Inc. Since the initial public offering in 2015, the stock price has plummeted from $47 a share to about $6. Investors remain worried about competition from Apple Inc. and Samsung Electronics Co., which Bloomberg Intelligence analysts describe as "dominant players with accompanying mobile ecosystems." But they all take solace in a fast-growing market: According to International Data Corp., sales of wearables may reach as much as $34 billion by 2020, up from $20 billion this year.

That cautious optimism also describes how I came away from the Ionic after spending a month running, swimming, and sleeping the smartwatch through its paces. This version has potential: It's far less reliant on the app than previous models, allowing more functionality directly on your wrist. I can set an alarm on the watch rather than choose my wake-up time on the app and wait for it to sync. The look is more distinctive than that of its predecessor, which had a similarly square shape but required you to pop it out of the casing to charge it.

Notably, the Ionic caters to the fickle habits of today's daily athlete, with a menu of exercise-tracking measurements that start with running, biking, and swimming. It's also waterproof and counts laps automatically. And there are options for treadmills and weights, helpful for keeping track of your timing and heart rate when you're traveling and relegated to a hotel gym.

A much-improved holdover from previous versions is the Coach app, which leads you through a series of high-intensity workouts, including 7- and 14-minute ones designed to get your heart rate up and kick the rust out. It even shows clips that demonstrate various exercises, which is good, because I didn't know what a "typewriter pushup" was.

That feature, says Fitbit's director for product marketing, Michael Polin, is where the possibilities for this device become clear. An update will give the watch the ability to learn your strengths and adapt, steadily increasing the challenges in a workout.

At $299, the Ionic is less expensive—but only slightly—than the Apple Watch Series 3, suggesting a coming arms race to develop the best apps. It's hard to bet against Apple when it comes to design and ease of use. The Ionic's download times for music—played through wireless headphones—are still long. And Strava, the workout-tracking social network, comes preloaded, but an even richer interface that gives more data about runs and rides, along with those in Strava, would be welcome.

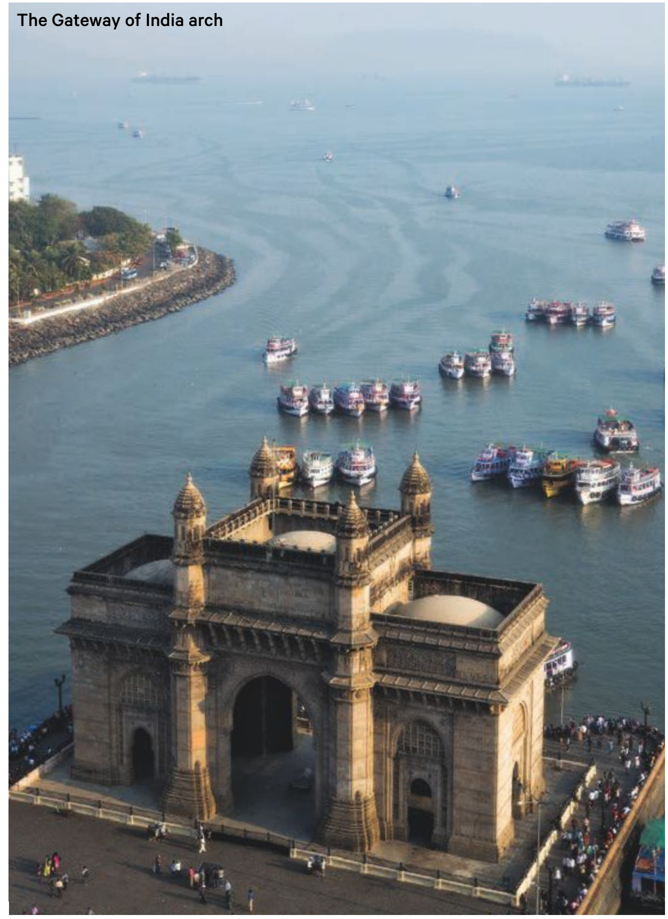
Polin says users should think of the watch as a platform that's easy to build on. "The idea is that it's better for you a year in than it was when you first got it," he says. "I think of the hardware as being an enabler." As if fitness addicts like me need another. B

PHOTOGRAPH BY JANELLE JONES FOR BLOOMBERG BUSINESSWEEK; PROP STYLING BY GOZDE EKER

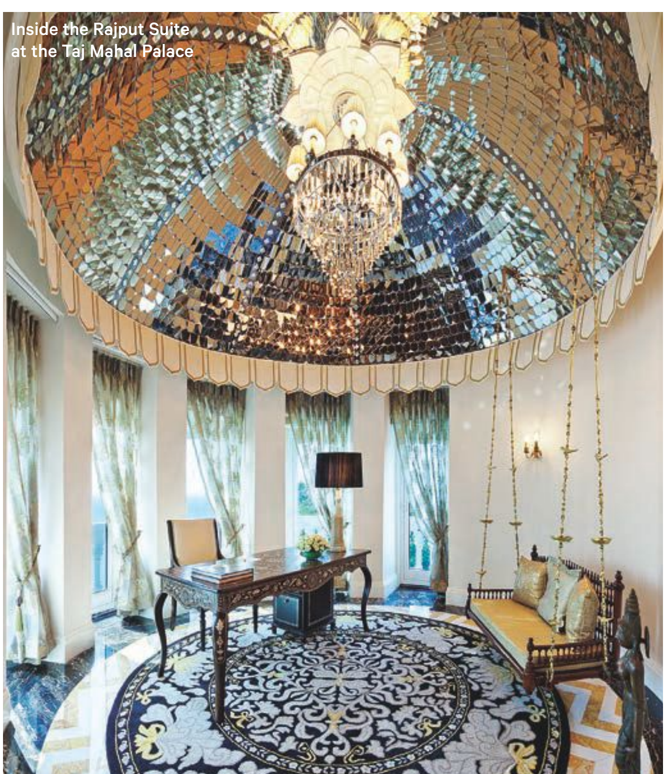
Make The Most of Mumbai

Even a brief visit to this thrumming megalopolis offers rich wonders
By Nikki Ekstein

For business travellers popping in and out of Mumbai quickly, the city's kaleidoscopic colours, vibrant cultural history, and frenetic traffic can seem impenetrable. How to scratch the surface of a city of more than 20 million people? Strategic planning, that's how. Even a couple of days are enough to see different facets of this evolving gem, where upward mobility for locals has spurred one of the world's fastest-growing luxury economies. Here's a guide to the best places to eat, shop, sleep, and explore.



The Gateway of India arch



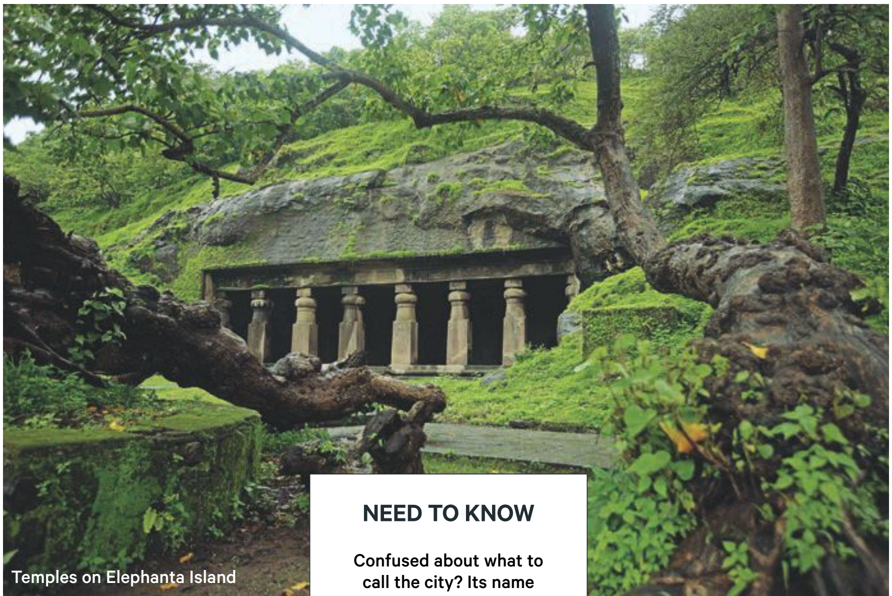
Inside the Rajput Suite at the Taj Mahal Palace

← STAY

The Oberoi and the Taj Mahal Palace are the only hotel names you need to know–and helpfully, they're complete opposites. The former, in a decades-old skyscraper with a prime location on Marine Drive, stands out for its world-class service: Expect pillowcases embroidered with your name. The monochromatic rooms are spacious and functional and a bit bland except for the views of the skyline, which locals call the Queen's Necklace (*rooms from $149; oberoihotels.com*). Guests can enjoy the same view from the slick rooftop pool at the Oberoi's sister hotel, the Trident, right next door. It's a slightly less formal and less luxurious property, but it has a more modern look and a popular Sunday brunch at its restaurant, Frangipani (*rooms from $121; tridenthotels.com*).

If the Oberoi is all brains, beauty defines the Taj Mahal Palace (*rooms from $124; taj.tajhotels.com*). Its 1903 building is a paragon of British colonial design, located conveniently near the Gateway of India arch monument. Free yoga classes are held by the pool each morning, and important Indian art lines the corridors. The rooms are small but exquisitely decorated; some even overlook the Gateway itself. Simply put, if the only taste you get of India is the Taj, your appetite for local flavour will still be satisfied.

PHOTOGRAPHS: GATEWAY OF INDIA: NATI SHOHAT/FLASH90/REDUX PICTURES. ELEPHANTA: XINHUA/EYEVINE/REDUX PICTURES. COURTESY TAJ MAHAL PALACE, PHILLIPS, BOMBAY CANTEEN



Temples on Elephanta Island

← SEE

If you've got a free day, take the ferry to Elephanta Island (*$2, round-trip*). The Unesco World Heritage site is a network of basalt caves, each filled with reliefs–some 20 feet tall–that date back 1,500 years to the cult of Shiva. The hourlong boat ride is a peaceful respite, and the 120-stair pathway to the temple provides a short workout in the company of playful monkeys.

↓ EAT

After bringing ambitious Indian food to New York City at Tabla, chef Floyd Cardoz returned to Mumbai to open Bombay Canteen (*thebombaycanteen.com*), a casual but buzzy ode to India's lesser-known regional dishes. Order the red snapper ceviche in herby *kokum* broth and the Kashmiri lamb, a heady, fall-apart stew redolent of turmeric and garlic. For a business dinner, the Table (*thetable.in*) is more glamorous than stuffy. The menu's upscale American bent is unique in Mumbai, with dishes such as sweet-and-sour Brussels sprouts and yellowfin tuna *tataki*, all executed by a chef who trained under Thomas Keller. Join locals at the workers' canteen Shree Thaker Bhojanalay (*91-22-2208-8035*). The unassuming, family-owned restaurant specialises in expertly prepared Gujarati *thalis*, all-you-can-eat sampler platters. Round out the day with cocktails at Aer, the rooftop bar at the Four Seasons (*fourseasons.com*). It's a popular place for guest bartenders from around the world, with views of the entire city.

Red snapper ceviche at Bombay Canteen

NEED TO KNOW

Confused about what to call the city? Its name was officially changed to Mumbai in 1995, but locals still call it Bombay.

–

Since India went cashless in November 2016, tipping has become trickier: Have waiters add 10 percent to your restaurant bill before they swipe your card, or ask hotel front desk attendants to add gratuities when you check out.

–

If you're concerned about safety, stick to UberX and above—the drivers will be better vetted.

–

Mumbaikars eat dinner on the later side—9 p.m. is normal. (They're not known for punctuality, either.)

–

Coconut water is high in electrolytes, making it a great cure for jet lag. Get it fresh from the vendors along Marine Drive.

Vintage prints and objets d'art at Phillips

↑ SHOP

Old Mumbai is best explored on foot. Start in Lion Gate, an historic dockyard neighbourhood, where D. Popli & Sons (*91-22-2202-1694*) creates custom jewelry with uncut gemstones. Next door, the kaleidoscopic Essajees (*essajees.com*) has antiques big and small salvaged from maharajah palaces. Around the corner, Phillips (*phillipsantiques.com*) is an art lover's heaven stocked with folk figurines and vintage photos. Nearby, the Kala Ghoda area has two great contemporary boutiques: Nicobar Design Studio (*nicobar.com*) sells clothing and housewares with rotating design themes, and Obataimu (*obataimu.com*) offers avant-garde items made in its open, fair-trade workshop.

Pasta's Magic Kingdom

Can FICO Eataly World persuade tourists to skip Italy's side streets and head straight to the superstore?

By Alessandra Migliaccio

Bologna, nicknamed *la grassa*—"the fat one"—for its wealth and edible delicacies, is located in Italy's Emilia Romagna region, the birthplace of tortellini, Parmesan, prosciutto, and balsamic vinegar. Foodies have long hopped on the two-hour train from Rome to hunt down the flavours nestled in the picturesque city and nearby hillside villages.

But now, you no longer need to find these delights on your own. Starting this November, you can tap vast swaths of Italy's food culture at Bologna's FICO Eataly World, or FICO for short. (The acronym stands for Fabbrica Italiana Contadina, which roughly translates to Italian Farming Factory, but also colloquially means "cool" or "attractive.")

And cool it is, even to a pack of jaded local and foreign journalists visiting just before the Nov. 15 opening. We are herded around the theme park's 25 acres of food stands, farmland, and exhibits by FICO's very own Willy Wonka, Oscar Farinetti. He's the ever-optimistic and hyperactive founder of Eataly, whose franchises stretch from New York to Tokyo, including one that recently opened in Los Angeles. Think of them as high-end megastores of Italian food and kitchenware. FICO is Farinetti's next step in his mission to bring farmers closer to consumers (and make a buck at it).

Farinetti leads us through a great L-shaped hall, dotted with stalls, restaurants, and workshops. You can walk around aimlessly and let it all sink in, or follow a path, either on foot or on one of the hundreds of new oversize Bianchi tricycles, which have wooden baskets to help you shop. Gesturing at the gleaming bikes, Farinetti can't help himself: "Isn't this *fico*?"

He waves frantically at an entire wall made of biodiverse apples (1,200 kinds), then boasts about having Europe's largest overhead solar panel installation. His produce is fresh from nearby farms, and there's livestock on location, which you can visit if you wander outside the shopping area into the orchards. The animals, as well-groomed as house pets, include nine different types of cows and a rare black-and-white-striped variety of pig Eataly is trying to preserve.

Guests can pose for pictures under an Instagram-friendly arch made of tomato-sauce cans or get pulled into one of the park's "rides," artistic multimedia experiences dedicated to our relationship with such things as fire, sea, wine, and the future. In the fire exhibit, I stand in the middle of an imaginary hearth complete with hologram flames and a 360-degree video showing shadows of prehistoric humans.

But the main attraction is the food. You can watch olive oil and pasta being made, or sip local wines and beer while you observe the various stages required to age prosciutto and cheese. (It's a thrill a minute.) I stop at a wooden counter where delicate slices of prosciutto are being cut by Massimo Pezzani and try his "liberated salami," which is free of preservatives. It's a magical, tasty world where the train—a tiny people-mover that mimics Italy's Frecciarossa fast trains—actually runs on time. There's even a post office to ship things home.

The park is a venture between Eataly and an Italian supermarket co-op group, and the building is owned by the municipality of Bologna. There are 150 businesses involved, from big ones such as Italy's Lavazza (coffeemakers) and Granarolo (cheese producers) to gelato machinery makers, a bookshop, and a hair salon that will massage biodynamic lemon into your locks. Michele Fucili, the co-owner of pasta startup SfogliAmo, says he sees FICO as "a chance to make it, both here and abroad."

Farinetti says he aims to have about 6 million visitors a year, 2 million of them foreigners. FICO Chief Executive Officer Tiziana Primori says she expects FICO to break even at $94 million a year.

So far, Italians I've spoken to seem lukewarm about the project; after all, they can watch pasta being made at home. But the shopping and restaurants are an enticement, and some are charming enough for date night. Others are great for families.

Farinetti says he was inspired by his visits to Disneyland and Americans' ability to turn anything into a multiplatform brand that prints money. The impression as one reaches the cash registers at the end of the open space, however, is of a giant foodie IKEA. It's all very sleek and cool, from the architecture and design to the gleaming fruits and vegetables. And it's delicious! But the impersonal massiveness of it is hard to obscure.

As I head out to catch the fast train back to Rome, which is about 25 minutes late, I peer down Bologna's streets at people heading home for dinner. Some are on bikes, but not Bianchis. Some tote groceries, probably bought in less glamorous locations. And though many look considerably less chirpy than Farinetti's optimistic farmers, I think I'd prefer to step into those streets and revel in Italy's imperfections.

But I live in Italy, and that may skew my viewpoint. So far, Farinetti seems to have done a good job whetting the world's appetite. Recently a friend from New York told me she was coming to visit, and she didn't ask whether to include FICO on her itinerary. She asked whether two days would be enough to spend there, or if she'd need three. Ⓑ

ILLUSTRATION BY GAURAB THAKALI

LG Laser Smart Home Theatre Projector

A small but mighty television replacement. *Photograph by Yasu+Junko*

THE CHARACTERISTICS
LG's newest home projector is a compact little device—just 4.6 pounds and about the size of a loaf of bread. But the $1,500 gadget, released in May by the 70-year-old Korean conglomerate, produces crisp, bright, full HD-quality images at up to 140 inches. The heart of the projector is the LG WebOS interface, an integral feature of the company's smart TVs that uses a Wi-Fi or ethernet connection to conveniently access Netflix, Amazon Prime, Hulu, and other streaming services. The projector has two HDMI and two USB inputs to connect to laptops and their ilk, as well as a coaxial cable jack for those who haven't cut the cord.

THE COMPETITION
As consumers' TV-watching habits evolve, the home-projector market has expanded—and innovated—accordingly. Options now include the pocket-size ASUS ZenBeam E1, which retails for $269 but uses LED bulbs that, at 150 lumens, demand a very dark room. LG's laser-illuminated model has a maximum brightness of 2,000 lumens, and the lamp has an expected life of 20,000 hours. The projector does need to be about 14 feet from the wall to get the full widescreen effect, a far cry from Sony's top-of-the-line VPL-VZ1000ES ultra-short-throw projector, which requires as little as 6 inches of space but costs $25,000.

THE CASE
It's easy to go from broadcast TV to Netflix and back again with the "magic" remote control, which uses an array of buttons and a laser-pointer-style cursor to navigate around the screen. Built-in speakers produce a slight 3 watts of sound, but the projector pairs readily with Bluetooth audio systems and even allows you to fine-tune sound and image synchronisation—often an issue with wireless audio. These features aren't rare in home projectors, but finding them in a single small package at this price uniquely qualifies it to be the one that finally replaces your TV altogether. *LG laser smart home theatre projector, $1,500; lg.com*

GAME CHANGER

Ozgur Ozvardar

An executive on a mission to transform payments in the Middle East and Africa

By Roger Field

While cryptocurrencies are attracting mass attention for their ability to offer secure and anonymous payments, in many parts of the world cash remains the main medium of exchange and more mainstream methods of electronic money transfer hold the key to transforming commerce. The Middle East is a prime example; credit card penetration is incredible low, with cash accounting for some 70% of payments - a scenario which leaves room for major disruption. Ozgur Ozvardar, vice president and general manager for the Middle East and North Africa for global payment specialist Verifone, is one man dedicated to driving the revolution in payments in the region.

Ozvardar stumbled into the world of electronic payments and ecommerce solutions almost by accident, having previously been marketing and sales chief for a textile company in Turkey. He joined Verifone in 2008 as a sales manager and quickly saw the potential to bring genuine change to the lives of companies and individuals in the Middle East and Africa, particularly small and medium sized businesses that lacked access to affordable payment systems.

While the Middle East may lag more developed markets such as Europe and the US in terms of payments, the region has some surprises. For example, Ozvardar says that the Middle East is ahead of some developed markets when it comes to the adoption of certain technologies such as contactless payments. This positions the region for even more growth and development in payment systems, Ozvardar says.

Became VP and GM of Verifone in MENA in 2015

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Joined Verifone in 2008 as sales manager

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Education: MBA from Bogazici University and Economics degree from Galatasaray

"The future is going to be contactless, whether that's in the form of NFC enabled cards, mobile wallets or payment apps," he says.

Banks are already upgrading their systems to enable contactless payments and third-party providers are developing solutions to keep up. Ozvardar says that Verifone is well-placed to leverage this, having offered contactless payment-enabled terminals since 2008. "We were the first in the industry to do so, and now nearly all of our products are able to receive contactless payments," he says.

Furthermore, the rapid adoption of smartphones and tablets is also driving change by leading a convergence of the offline and online payment worlds, further opening the value chain to organisations ready to upgrade their systems. This paves the way for Verifone to help merchants create bespoke experiences at the checkout with services and applications designed to offer speed, convenience and growth.

But it is Ozvardar's understanding of the needs of retailers combined with Verifone's solutions that will really help the company deploy its technology and transform payments in the region. "The 21st century retail environment is a jungle, and just when merchants think they've hacked their way through it, it gets more complicated," he says. "With regulatory advancements, technological growth, and generational forces constantly changing the landscape, it is important for merchants to turn these challenges into opportunities and cater to the evolving needs of the connected consumer."

PHOTO ILLUSTRATION BY SJC


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