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The Risk Issue

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DEBUNKING MYTHS about bond ETF liquidity

Some bonds don't trade very often. Sometimes they don't trade very cheaply. They live in a decentralized marketplace featuring dealers, market makers, clients and buy-side managers, where there are no executable quotes, trades handle through "request for quote" platforms, and only about 11% of corporate debt issues trade daily[1].

It's an opaque, complex and often not very agile marketplace, posing operational and logistical challenges that require extensive manual human intervention. Since the global financial crisis, regulations have dramatically squeezed dealer inventories of corporate bonds, causing a spike in the value of outstanding bonds and increasing the cost and inefficiency of creating portfolios with individual securities.

Fixed income ETFs inevitably carry the baggage of the market on which they are based. How, investors may justifiably ask, can an ETF that trades throughout market hours like an equity own bonds that may not trade at all?

Because of this and other questions, certain myths persist about the liquidity of fixed income ETFs.

Myth 1

Bond ETF investors won't be able to find liquidity during market sell-offs

Reality

Bond ETF trading tends to surge during volatile market periods

The USD20 trillion US equities market has a daily notional trading value of about USD283 billion. The larger USD23 trillion fixed income marketplace sees a daily trading value of about USD33 billion (excluding Treasuries)[2]. The enormous liquidity gulf between stocks and bonds has led to the idea that investors in bond ETFs will find their money trapped during periods of volatility.

In fact, bond ETFs provide a solution to the liquidity challenge.

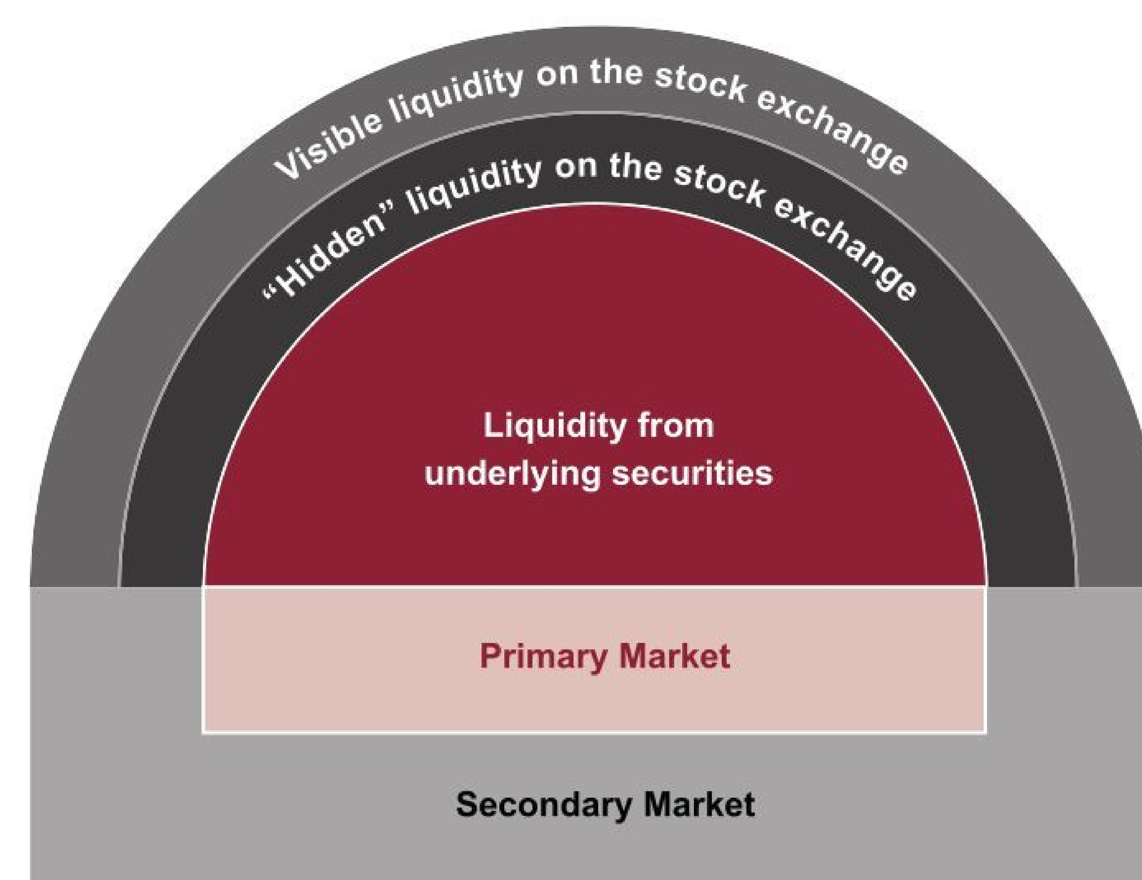
The ETF structure has two layers of liquidity: liquidity from the underlying securities (primary market), and "hidden" and "visible" liquidity on an exchange (secondary market). About 80 percent of fixed income ETF trading takes place on the secondary market in the US[3] – trades pass from one ETF holder to another – so the actual bonds don't need to be touched at all, which insulates ETFs from their less liquid underlying constituents.

When underlying bonds do need to be bought or sold to facilitate a creation or redemption, most managers of the largest ETFs ask for only a fairly liquid and statistically representative subset of the whole portfolio to be delivered by the participating dealer.

As for the idea that the market will close up during a crisis, the opposite is true. Statistically, trading on bond ETFs surges during periods of volatility.

If investors wanted to trade a broad portfolio of individual bonds, they would need to find a

LAYERS OF LIQUIDITY FOR ETFs



Source: Vanguard.

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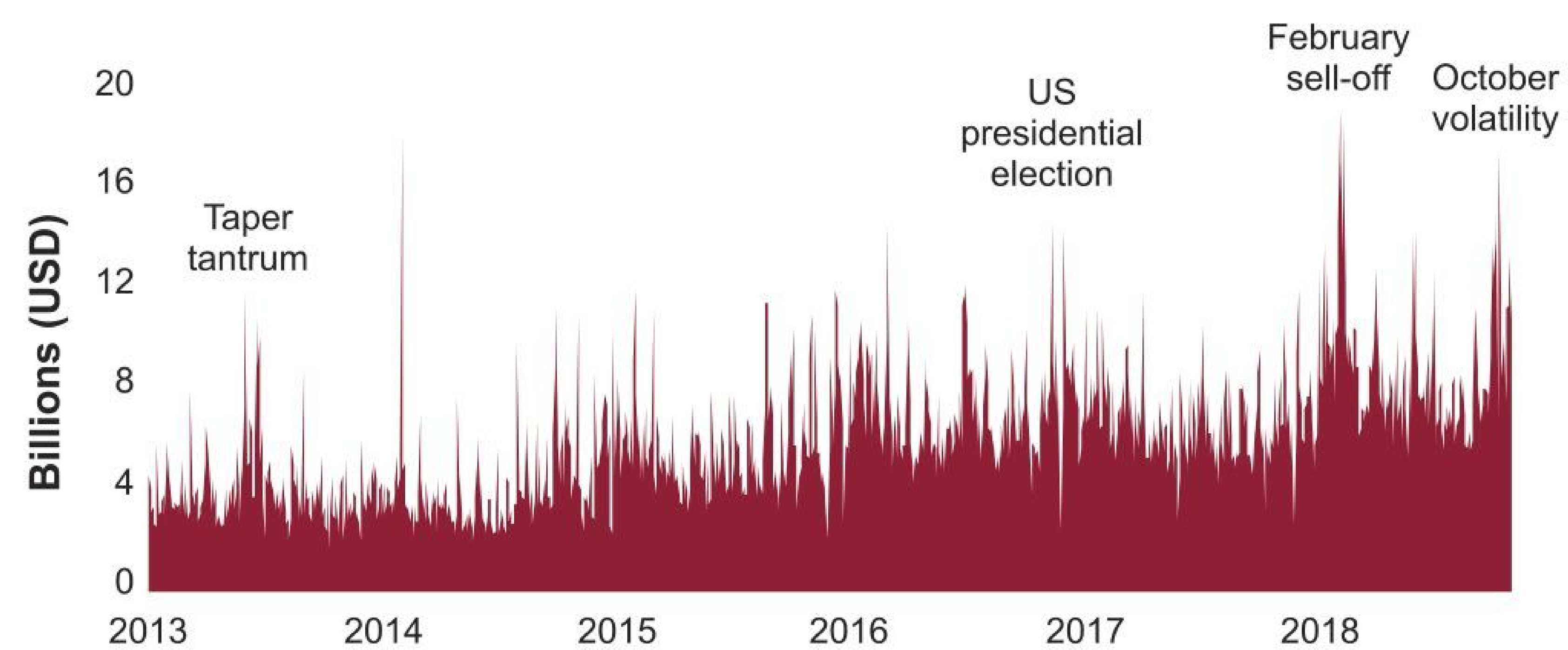
counterparty for each one. In a volatile market, this would be both difficult and expensive. With an ETF, the liquidity is channeled into a single location, making it much easier to match investors who might not otherwise meet in the fragmented bond marketplace.

Moreover, as we noted earlier, more than 80% of bond ETF trades occur in the secondary market, which essentially means that when a bond ETF changes hands, the underlying bonds themselves are not trading.

AGGREGATE DAILY TRADING VOLUME ACROSS ALL US-LISTED BOND ETFs



Source: Vanguard calculations, based on data from Bloomberg.
Notes: Volume in the secondary market is defined as the aggregate amount traded across all US-listed bond ETFs. The chart includes data from 3 January 2013 through 31 October 2018.

Myth 2

Bond ETFs trade with wider bid-ask spreads during market sell-offs

Reality

Spreads hold up well during market sell-offs and are still narrower than when trading individual bonds directly

Fixed income ETF investors already benefit from substantial savings because of the ability of ETFs to trade bond portfolios in the equity-market ecosystem without incurring the cost of trading the underlying securities. But it's often assumed that investors will be subject to wider spreads during periods of crisis or volatility.

This is also a misconception.

In fact, data indicate that spreads hold up well during market sell-offs because of the secondary layer of liquidity that means most trades are conducted in the secondary market. As the illustration shows, even on the most volatile days with the most extreme market movements, the volume-weighted average bid-ask spread of corporate bond ETF trade is as low as a few basis points. That's considerably narrower than the equivalent costs of buying or selling a bond portfolio.

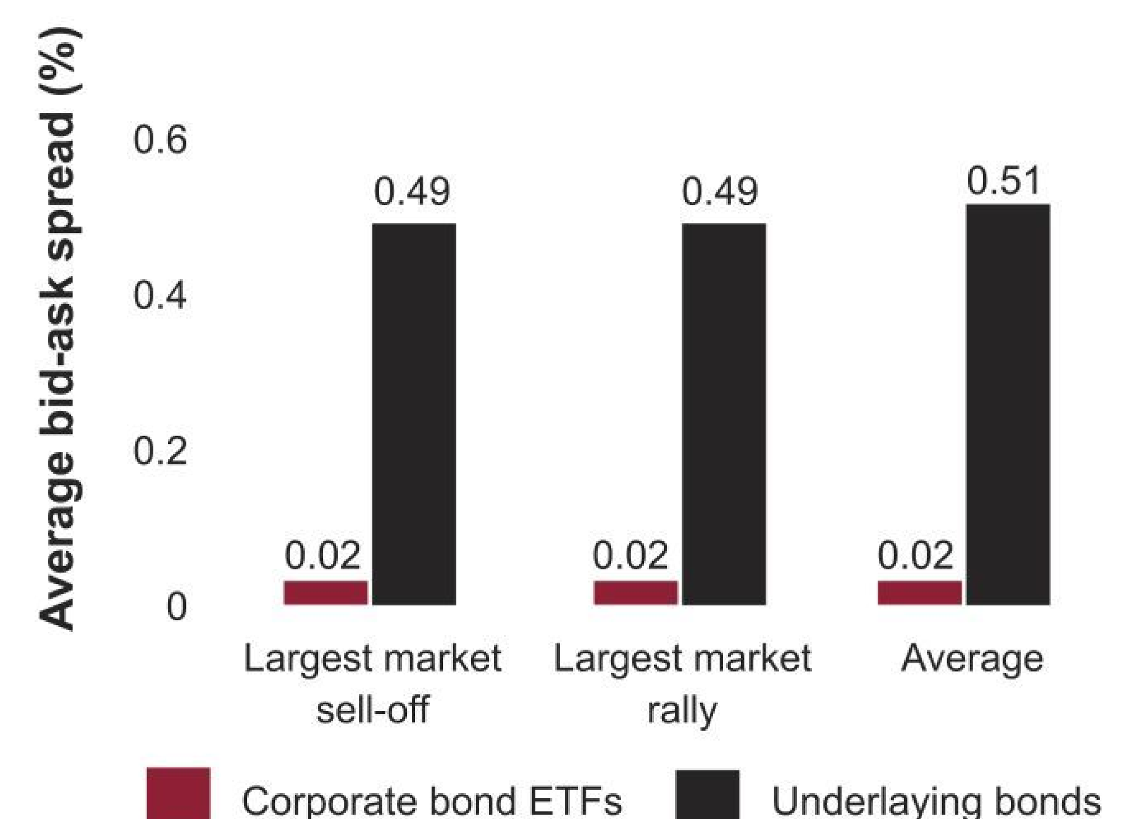
For example, long-dated corporate bonds have a liquidity cost score (LCS)[4] of 110 basis points. The LCS for Vanguard's US-listed, long-term corporate bond ETF is a spread of only about six basis points.

Investors who remain wary can consider using limit orders to protect themselves from wider bid-ask spreads. Limit orders enable them to set the price at which they are willing to buy or sell an ETF, essentially taking the risk of mispricing off the table.

As a prolonged era of low interest rates and low yields has focused attention on the impact of management fees on investors' long-term returns, these misconceptions are fading and investors worldwide are warming to fixed-income ETFs. In the first six months of 2019, global inflows into fixed income ETFs exceeded their equity counterparts, and total bond ETF assets under management passed USD1 trillion for the first time this year[5].

Throughout its more than 40-year history, Vanguard has been the trailblazer for the concept of low-cost investing, consistently delivering low expense ratios and impressive long-term performance to investors. As the era of fixed income investing gathers momentum, Vanguard's large-scale, low-cost model will continue to offer the best solution for bond market exposure.

AVERAGE DAILY CORPORATE BOND ETF BID-ASK SPREADS VS. UNDERLYING BOND BID-ASK SPREADS



Source: Vanguard calculations, based on data from Bloomberg and Barclays Point.
Notes: ETF spreads are measured as the volume-weighted bid-ask spread across all corporate ETFs. Barclays LCS, is used as the proxy for bond market bid-ask spreads. The performance of the Bloomberg Barclays U.S. Credit Corporate 5–10 Year Total Return Index was used to identify the largest single-day market moves and underlying bond bid-ask spreads. Data include observations between January 3, 2017, and October 31, 2018, from the zero to 99th percentile and exclude holidays.

1. FINRA.
2. Phil Mackintosh and Ka Wo Chen, 2016. Tracing the bond market. Jersey City, N.J.: KCG Americas LLC.
3. Vanguard Investment Strategy Group, 2016. Exchange-traded funds: Clarity amid the clutter. Valley Forge, Pa.: The Vanguard Group.
4. Liquidity cost score is a bond-level liquidity measure that is defined as the cost of a standard, institutional-size, round-trip transaction, comparable to a bid-ask spread for the underlying bonds.
5. ETFGI, as of June 2019.

For more on fixed income investing, visit www.vanguard.com.hk/fixedincome

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COVER ARTWORK BY
PATRICK LEGER

"Being a confirmed acrophobic, my mind always drifts directly to the idea of falling when I think of danger. Playing off this idea, I came up with the concept of a bounding ibex, a Eurasian mountain goat, aiming for a narrow ledge to attain greater heights."

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Corrections: "Surveillance" (Oct./Nov.) misspelled Anh Le's name. "A Rebel's Guide to Finance" should have said Rune Christensen is considering whether the Maker Foundation, not Maker DAO, should obtain a broker-dealer license or acquire a licensed brokerage firm.

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The Risk Issue

For *Bloomberg Markets*' readers, taking risks is a daily occupation. As we embark on a new decade, we've devoted this issue to a few perils—and opportunities—that we find worthy of special consideration.

In "The Year in Risk" (page 52), we illustrate some of the risks that made an impact in 2019, whether populist upheavals and negative interest rates or imploding unicorns and the surge in leveraged debt.

Guo Shuqing has one of the toughest jobs in global finance: trying to tame the hazards in China's vast banking (and shadow banking) system without stifling growth. In "Walking a $40 Trillion Tightrope" (page 56), Bloomberg News reporters tell the story of his perilous path.

After a series of leaders failed to revive Deutsche Bank's fortunes, Chief Executive Officer Christian Sewing embarked on aggressive cost cutting and asset sales. In "Christian Sewing's Emergency Surgery" (page 68), **Steven Arons** examines Sewing's progress on a plan that some see as the bank's last option.

Mexican President Andrés Manuel López Obrador took office with a populist program that put the state-owned oil company, Petróleos Mexicanos, at its center. One year later, AMLO's plans aren't pleasing financial markets—or residents of some of Mexico's oil-producing regions, as **Amy Stillman** and **Justin Villamil** report in "Making Pemex Great Again" (page 60).

In the era of cyberthreats, what role can insurers play? In "Asymmetric Warfare" (page 72), **David Voreacos**, **Katherine Chiglinsky**, and **Riley Griffin** explore the far-reaching implications of Merck & Co.'s legal battle with its insurers over a damaging cyberattack.

We hope you find the magazine enlightening and thought-provoking. As always, we welcome your feedback. Be careful out there.

Christine Harper, Editor

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Markets Almanac

A few key events for your calendar in the coming months.

Dec

12

U.K. election

Snap vote will be the nation's third general election in four and a half years

29

30th anniversary of Nikkei 225 peak

Tokyo

The Japanese benchmark remains about 40% below the 38,915.87 record set in 1989

Type **{NKY <GO>}** for a menu of data on the Nikkei 225; **{COUN JP <GO>}** for a country guide to Japan; **{WEI <GO>}** for major world equity indexes.

Jan

3–5

American Economic Association annual meeting

San Diego

Economists network in the Southern California sun

21–24

World Economic Forum annual meeting

Davos, Switzerland

VIPs connect in the icy Alps

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25–30

Lunar New Year holiday

China, Hong Kong, Singapore, South Korea

The year of the rat begins

31

Brexit?

U.K.-European Union

Latest deadline for the controversial divorce

Feb

1–2

Australian Open singles finals

Melbourne Park

2019 winners: Novak Djokovic and Naomi Osaka

3

Iowa Democratic presidential caucuses

The first U.S. state to choose among the party's candidates

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25–27

International Petroleum Week

London

The industry examines its role in "a low-carbon future"

25–28

SuperReturn International

Berlin

World's largest private equity and venture capital event

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By FRANCINE LACQUA, JASON KELLY, and DANIEL SCHAEFER

NO ONE MAKES IT TO the top of a major financial company without a keen understanding of risk. So we asked leaders of investment banks, asset managers, insurers, and private equity firms for their assessments of the perils that await in 2020. As they see it, there's plenty to worry about—but there are also ways to be ready.

What Is the Biggest Risk in 2020—and How Are You Preparing?

"I don't think the biggest risks are related to the economy. There is a lot of uncertainty around the political landscape, which can cause businesses to hesitate on investment decisions. I wouldn't say we're going to talk ourselves into a recession, but uncertainty around the political landscape isn't helping the economy or markets.

"As we look out over the next several years, **monetary policy** will continue to be a big focus, and I believe we'll look back and have lessons learned around the implications of negative rates.

"We respond by staying focused on our clients and how we can help them navigate the challenges they face. And as a firm, we have a long-term strategy in place that we're implementing, which is focused on harnessing growth opportunities in our existing businesses, building out new businesses such as consumer, and raising efficiency. Having said that, we have a 150-year history of adapting to dynamic operating environments."

David Solomon

CHAIRMAN AND CHIEF EXECUTIVE OFFICER
GOLDMAN SACHS GROUP INC.

"I am keeping an eye on the potential for a longer-term deterioration in the bilateral relationship between **the U.S. and China**. If the structural differences separating our two economic and political systems cannot be bridged over time, the ensuing escalation could lead to restrictions on investment and financial flows between our countries. Artificial restrictions on things like access to capital markets, cross-border investment, and asset ownership could slow economic growth and cause significant liquidity issues to emerge, with unpredictable and potentially deleterious market outcomes.

"We remain focused on what we know we can control. This means investing for the long term, remaining disciplined and balanced, working with great partners, and deriving all we can from our global platform to help drive value creation regardless of periodic market disturbances or what's going on politically."

Kewsong Lee

CO-CEO
CARLYLE GROUP LP

"Economies around the world are slowing after a period of growth but are still showing resilience—particularly in the U.S. The global trend toward lower and even negative interest rates threatens to further damage growth and leave countries in a challenging position during the next downturn. But the biggest near-term risk remains **geopolitical**. Any number of seen or unforeseen issues could shake investor confidence and have an immediate negative impact. As I outline in my new book, *What It Takes*, Blackstone has built a culture that incorporates these downside risks into our decision-making, and it is important that governments, institutional investors, and companies alike do the same."

Stephen Schwarzman

CHAIRMAN AND CEO
BLACKSTONE GROUP INC.

"Any move—whether it be election results or other **political actions**—to cripple free-market capitalism and private property rights is the biggest risk. As an investor, the solution, as always, is to seek the highest-quality businesses and the lowest valuations."

David Herro

DEPUTY CHAIRMAN
HARRIS ASSOCIATES

"I see a high number of risks in 2020. For example: the trade conflict between the U.S. and China, the Middle East conflict, Brexit, U.S. elections, or more generally a deepening of current economic weakness around the globe. However, it's not these risks per se that worry me the most. Such downside risks are known challenges for which one can prepare. What worries me more is the unprecedented level of uncertainty associated with these risks. For example, I worry about the potential adverse consequences of a reversal of globalization, the side effects of the extraordinarily accommodative monetary policy of the last 10 years on financial and monetary stability, or the potential systemic consequences of **cyberattacks**. As a bank, we have to be aware and prepared for such risks in highly uncertain times. This is why we feel comfortable with our regionally and divisionally diversified businesses. It allows us to manage our risk exposure prudently and our financial resources responsibly."

Axel Weber

CHAIRMAN
UBS GROUP AG

"One: Continued fragmentation of the neoliberal world order. For most of the postwar era, the world has benefited enormously from freer trade and less impeded capital flows. The winners clearly outnumbered the losers. It must be hoped that **growing trade frictions** do not end up shrinking the pie, making redistribution toward the losers of globalization more difficult, in turn further radicalizing politics.

"Two: Monetary policy challenges. Falling and low inflation rates over the past 40 years were, among other reasons, the result of central banking having become less influenced by politics and globalization reducing the bargaining power of labor. In the face of persistently low inflation and central banks failing to meet their inflation target, there's a risk that central bankers are blamed from all sides of the political spectrum—laying the ground for a repoliticization of monetary policy. Besides this, the challenge of how to exit QE [quantitative easing] in the context of a slowing global economy is becoming ever more daunting.

"As a consequence of these significant risks and uncertainties, we are taking a very cost-conscious approach to 2020 and beyond."

Andreas Utermann

CEO
ALLIANZ GLOBAL INVESTORS

"Negative bond yields are now of systemic concern. With central bank rates at their lowest levels and U.S. Treasuries at their richest valuations in 100 years, we appear to be close to bubble territory, but we don't know how or when this bubble will burst. Central banks are under great pressure to support risk assets and risk sentiment, regardless of potential moral hazard. The eventual reversal of the continued downward trend in rates and yields could have highly disruptive ramifications—this is one reason that central banks including the U.S. Federal Reserve and the [European Central Bank] have backtracked on hiking rates several times since the GFC [global financial crisis].

"Another area of concern is liquidity. The frictionless flow of capital around the world is subject to increasing barriers. Examples such as the U.S.-China trade war and the EU-Swiss spat over the trading of listed securities show that political disagreements are spilling over into capital and trade restrictions. As capital becomes less free-flowing and confined to smaller pools, it will weaken the ability of the financial system to respond dynamically to **unforeseen liquidity events**, such as an unexpected counterparty failure.

"This is the time to be an active manager who can dynamically monitor and adjust for potential systemic risks. We meet regularly to review our macro positioning and are focusing on quality in our stock and credit selection, leaning on our strength in fundamental, bottom-up corporate research. We are diversifying among styles, sectors, and regions, and are drawing on our ability to trade in different jurisdictions and time zones and ensuring the maturity of investment and borrowings are appropriately matched."

Anne Richards

CEO
FIDELITY INTERNATIONAL

Lacqua is the London-based co-anchor of Bloomberg Surveillance *and host of* Leaders With Lacqua *on television.*
Kelly is New York bureau chief and host of Bloomberg Markets *and* Bloomberg Businessweek *on radio. Schaefer is bureau chief for Germany.*

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Two Views on a Wealth Tax

ILLUSTRATION BY MATT CHASE

A Wealth Tax Would Make The U.S. Less Dynamic

► p18

A Wealth Tax Could Make Americans Happier

► p19

The vision of the founder is often a company's most crucial nontransferable asset

By KARL W. SMITH

MOST OF THE CRITICISM of a wealth tax, an idea that is quickly becoming mainstream within the Democratic Party, revolves around its feasibility. The more compelling argument, however, is against it on principle: It would allow the federal government to undermine a central animating idea of American capitalism.

Set aside the questions of whether a wealth tax would be constitutional or how much revenue it would raise. Instead, focus on whether it could be made to work—and what it would mean if the answer is yes.

The U.S. probably could design a wealth tax that works. As economists Emmanuel Saez and Gabriel Zucman point out, European attempts at a wealth tax suffered because the tax started at too low a level and because too little was done to prevent tax competition.

Until 2018, France placed a "solidarity" tax on wealth in excess of €1.3 million ($1.4 million). The low threshold meant that those with moderately successful small businesses were subject to the tax every year, regardless of whether they were profitable. Meanwhile, the very wealthy could move to London and avoid the tax altogether. In 2006 it was estimated that 843 high-net-worth individuals left France as a result of the tax. The tax was functionally a levy on those without the means to avoid it. Predictably, this made it highly unpopular.

Saez and Zucman propose exempting at least the first $50 million, a provision that both Senator Elizabeth Warren (D-Mass.) and to a lesser extent Senator Bernie Sanders (I-Vt.) have endorsed. That would address the problem of the tax starting too low.

As far as tax competition is concerned, the size of the U.S. economy—and the importance of the U.S. in the global financial system—would allow it to put enormous pressure on tax havens to cooperate. If a country were harboring runaway billionaires, the U.S. could effectively lock it out of the international financial system. That would make it practically impossible for high-net-worth people to have control over their wealth, even if they could keep the U.S. government from collecting the tax.

The necessity of this type of harsh enforcement points to a much larger flaw in the wealth tax: Billionaires don't accumulate wealth just to engage in extravagant consumption, though many do that. The main advantage of their wealth, I suspect, is that it allows them to control the destiny of the enterprises they founded.

A wealth tax stands in the way of this by requiring billionaires to sell off stakes in their companies to pay the tax. For publicly traded companies, this means owning a dwindling share of the outstanding stock. For privately held companies, this means transferring some of the company directly to the government. (Under Sanders's plan, the government could take up to 8%.) After a few years, even a founder who started out with complete ownership would have just a minority stake in her company.

For Saez and Zucman, this is a feature, not a bug. In an October discussion with some of us at Bloomberg Opinion, Saez explained that the point was to democratize large companies and move them toward professional management. If the founder is the best person to run the company, he argued, then she could be hired as chief executive officer even if she owned no shares of the company at all. Steve Jobs, he pointed out, came back to run Apple Inc. after being ousted.

Consider that example for a moment: Jobs was invited back to Apple precisely because it collapsed without him. One of the things that makes capitalism work is the way it makes economic resources available to those who've demonstrated an ability to deploy them effectively. It's the upside of billionaires.

Textbook economic theory sometimes pretends that all companies are alike and that profit-maximizing occurs naturally. In reality, the vision of the founder is often a company's most crucial nontransferable asset.

A wealth tax designed to democratize control over companies would strike directly at this strength. The predictable results would be, in the short run, the curtailment of existing founders' control. In the longer run, a wealth tax would penalize the founders with the most dedication to their businesses. Entrepreneurs would be less likely to start businesses in Silicon Valley or elsewhere if they thought their success would result in the loss of their ability to guide their company.

A wealth tax would make the U.S. less hospitable to the most visionary (and yes, often eccentric) entrepreneurs, who do so much to make the U.S. economy resilient and dynamic. America's anything-is-possible style of capitalism is not only one of the nation's defining features but also one of its greatest strengths. ●

Smith is a former assistant professor of economics at the University of North Carolina's school of government and founder of the blog Modeled Behavior.

Progressive taxes may encourage a sense that the world is more fair and promote social trust and cohesion

By STEPHEN MIHM

WHEN A STUDY released in October showed the wealthiest Americans paying a lower tax rate than any other group, Democratic presidential candidates embraced it as proof that they were on the right track.

While their tax-the-rich proposals vow to create a better economic balance, the candidates often pivot to what they would pay for with the proceeds: "Medicare for All," student loan relief, infrastructure repair, and other expensive programs. Those equations have raised serious doubts, and for good reason. Turning tax revenue into a massive health-care system—or measurable economic growth—is incredibly complicated. But raising taxes on the wealthy could deliver something meaningful that millions of Americans would feel rather quickly: happiness.

Recent research found that progressive taxes may make the average citizen happier and more content. In the course of their study, psychologists Shigehiro Oishi and Kostadin Kushlev of the University of Virginia and Ulrich Schimmack of the University of Toronto eschewed the usual debate about tax increases: Are they bad for economic growth? Instead, they focused on a more emotional one: Do Americans feel happier—and experience a greater sense of fairness—under more progressive taxation?

The study mined data from something known as the General Social Survey, a program conducted by NORC at the University of Chicago. This statistical survey has been asking Americans a range of consistent questions since the early 1970s, including asking them to rank their "happiness" using a three-point scale.

The researchers found a very strong correlation between progressive tax policies and how happy respondents rated themselves. This effect was most pronounced—and statistically significant—among taxpayers in the lowest 40% of incomes. The correlation steadily diminished among higher-income groups, disappearing altogether for the top 40%.

But correlation isn't causation, so the researchers ran a time-lag analysis to determine whether the institution of progressive taxes influenced happiness levels five or 10 years later. Here they found a robust correlation: Progressive taxes predicted happiness for lower-income groups. But it didn't work the other way around: Happiness didn't anticipate progressive taxes. As the researchers put it: "The temporal sequence seems to flow from progressive taxation to happiness."

To rule out other possible explanations, the researchers also ran regression analyses to determine whether other, proximate causes might explain the relationship: crime rates, for example, or unemployment. Only tax policy seemed to account for the outcomes.

So what was going on here? Previous findings by some of the researchers in the more recent study showed a strong correlation between income inequality and two other sentiments measured by the General Social Survey: fairness and trust. This work had found that respondents thought the world was fairer—and were more willing to trust other people—in years when income inequality was lower. A study of 54 nations completed in 2011 echoed the findings.

A skeptic, of course, might ask the obvious question: That's all well and good for people on the lower rungs of the socioeconomic ladder, but what about the wealthy? How would they feel about paying higher taxes?

It's hard to imagine that they would be thrilled—or so conventional wisdom would suggest. In fact, the researchers actually asked a group of contemporary respondents how they thought progressive taxes might affect the outlook of people at different income levels. They overwhelmingly predicted that even if progressive taxes led to more happiness among lower-income groups, any such gains would be more than offset by the unhappiness experienced by the wealthiest Americans.

Instead, historical data showed more of a mixed bag. The happiness levels of the wealthy showed no signs of increasing during times of progressive taxes, but they didn't become significantly unhappier, either.

"Our most important finding," the researchers concluded, "is that progressive taxation is not a zero-sum game where a large group of poor people benefit from a big loss of a small group of wealthy citizens. Rather, poorer citizens benefit without a notable loss in happiness among the wealthiest citizens."

The researchers wisely cautioned that their findings shouldn't be read as a blanket endorsement of progressive taxation. But the results do suggest progressive taxes may encourage a sense that the world is more fair and they promote social trust and cohesion. Not coincidentally, these qualities are conspicuously absent in our current choleric moment.

Presidential candidates should take note: The best argument for progressive taxation may be the subtle psychological effects of such a move. Sure, paying for social programs is nice. But alleviating the anger that defines the national mood would be even better. ●

Mihm, an associate professor of history at the University of Georgia, is a contributor to Bloomberg Opinion.

The Fire This Time

FOR DECADES, California has built ever deeper into its hills, canyons, and valleys to provide cheaper housing for residents priced out of the cities. That growth increasingly poses existential risk. Rising temperatures and more frequent droughts are creating ideal conditions for wildfires, just as more people move into harm's way. Jamie Castiel, shown here in his backyard, is one of them. The 66-year-old accountant moved three decades ago to Porter Ranch, a development at the north end of the San Fernando Valley, and loved the views over Aliso Canyon. In October the Saddle Ridge Fire threatened his home in the middle of the night, lighting up a palm tree and raining embers on his roof. Rather than evacuate, he grabbed a hose to hold back destruction. His house is standing but uninhabitable because of smoke damage, he says. He probably wouldn't move to Porter Ranch today, but he has roots here now—and a plan for the next time: "I'm going to get a stronger hose." **{MAP FIRE <GO>}**. —*Noah Buhayar*

PHOTOGRAPHS BY ANASTASIA SAMOYLOVA

The Saddle Ridge Fire jumped two Los Angeles freeways. Strong Santa Ana winds spread it quickly to the dry canyons and hillsides in Porter Ranch, forcing the evacuation of about 100,000 people. By the time firefighters contained the blaze, it had burned almost 8,800 acres, destroying 19 structures and damaging 88.

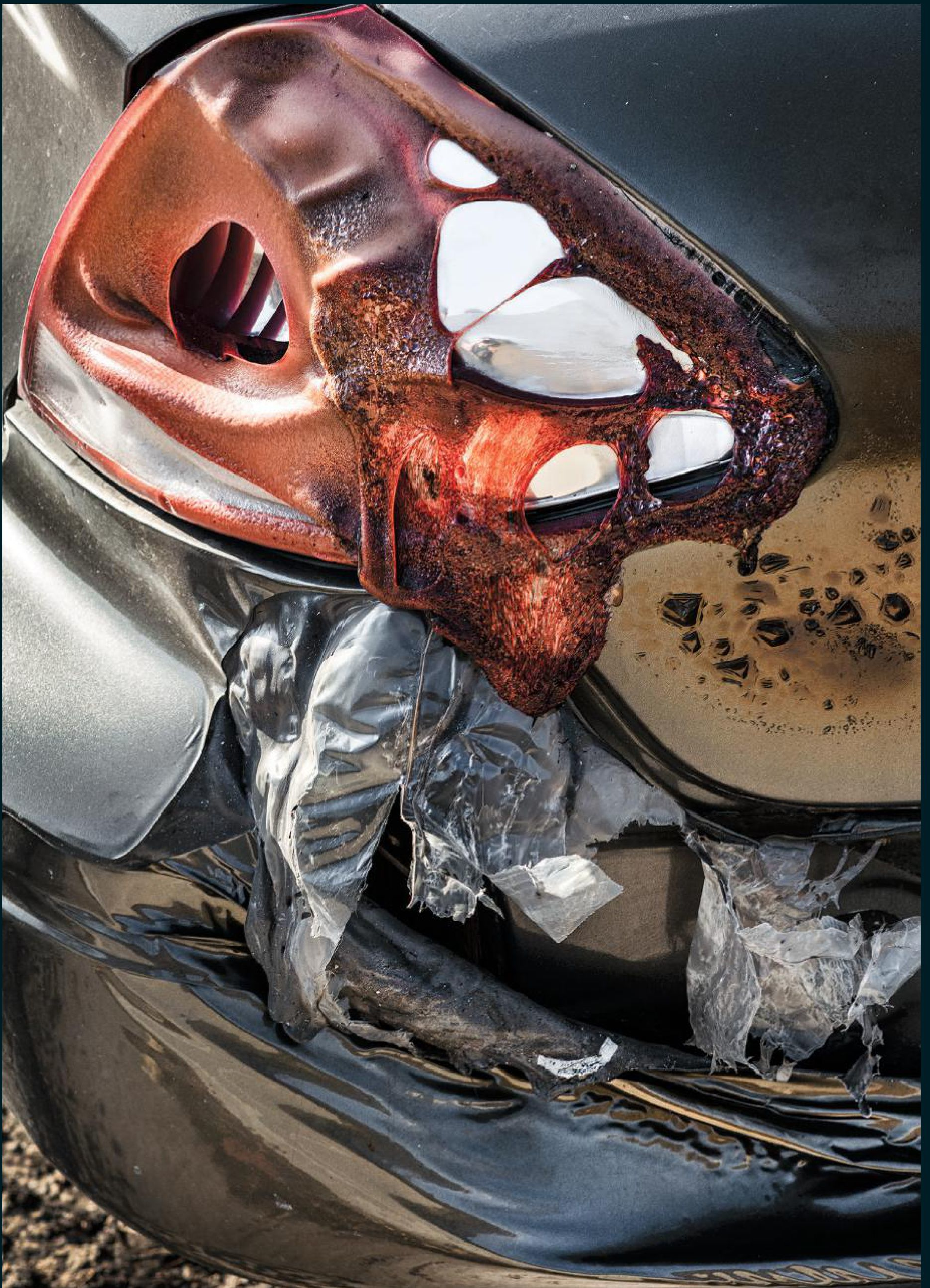
Many people priced out of Los Angeles and the San Fernando Valley are moving to planned communities like this Toll Brothers development in Plum Canyon in Santa Clarita. The state will soon require new houses to have solar power, part of a commitment to cut greenhouse gas emissions. But it still allows development in areas threatened by climate change.

New communities in Southern California such as Cascades at Porter Ranch often include so-called fuel modification zones—plantings designed to provide a buffer between combustible grassland and homes. Experts say these modifications can help, but they're no panacea when it comes to intense, wind-driven fires from which embers can travel for more than a mile.

California electric utilities are increasingly being blamed for unleashing wildfire disasters. On Oct. 28 a broken tree branch hit a power line and sparked this blaze near the Getty Center in Los Angeles. The fire burned 745 acres, forcing celebrities including LeBron James and Arnold Schwarzenegger to flee their homes.

Hillsides doused in pink-hued fire retardant have become a common sight in California, where emergency responders are increasingly battling to contain blazes. October's Tick Fire, which burned 4,600 acres in Santa Clarita, was near this hill.

Tejon Ranch Co. won approval for a 19,333-home community in a remote valley 60 miles north of Los Angeles. The development will sit in areas the state defines as having a "high" or "very high" fire risk. To protect residents, the community will have at least three fire stations and even a herd of cattle for strategic grazing, leaving less grass to burn.



Researchers from the U.S. Forest Service and the University of Wisconsin at Madison recently found that homes on the edge of wildlands are providing fuel for more destructive blazes in California. Above is an automobile taillight melted almost beyond recognition in the Tick Fire.

Explore Data-Heavy ESG Investing Ideas Across Asset Classes

By VINCENT TONG

CAN THE GREEN BOND MARKET provide insights for equity strategies? Seems possible, but where do you even start with an idea like that?

One way is to use Bloomberg Query Language (BQL) for in-depth, cross-asset analysis. BQL—Bloomberg's new analytics paradigm based on normalized, curated data—allows you to perform custom analysis in the Bloomberg cloud. You can use a single formula to analyze topics that previously required downloading and manipulating thousands of data points in Excel.

For a sample spreadsheet loaded with the formulas discussed below, type "DOCS 2092476" in the command line of a terminal screen, hit <GO>, and click on the Download Document button.

Green Bonds

Let's start with an overview. Green bonds are securities whose proceeds are earmarked for projects that promote climate change mitigation, adaptation, or other environmental sustainability purposes. On the Bloomberg terminal, green debt is flagged with a GREEN_BOND_LOAN_INDICATOR data item, which returns an affirmative Y if "Green Bond/Loan" is specified as the use of the instrument's proceeds.

Using BQL, we can filter for bonds that match that criteria. In the spreadsheet, click on the Green Bonds Analysis tab if it isn't already selected. Below the heading Issuance Analysis are a series of filters and let(), get(), and for() clauses. A BQL formula pulls in these clauses and outputs a snapshot of the market. To see the formula—which takes the form =BQL.Query()—click in cell B32.

Since 2015, more than 2,000 green bonds have been sold. The number of issues this year rose to 586 as of mid-November, an increase of 92% from full-year 2015. The amount raised has jumped even more, increasing 371%, from $39 billion in 2015 to $183 billion in 2019. OK, the market is growing quickly.

Next, let's take a look at the ratings of these bonds. Use the scroll bar at the bottom to move just to the right of the Ratings Analysis section. The BQL formulas here let you segment the universe of green bonds issued since 2015 by ratings. One thing quickly emerges: 54% of the green bonds are investment-grade, that is, rated triple-B or higher.

So who's been issuing those investment-grade green bonds this year? With BQL, you can customize and manipulate fixed-income data to aggregate by the issuing entities. Use the slider to move farther right to the Aggregate by Issuer section. One formula here screens the universe of bonds by rating and issuance date, aggregates the amount sold by each issuer, and then ranks and sorts the results.

You can quickly see that the biggest investment-grade issuer was Kreditanstalt für Wiederaufbau, the German state-owned development bank, which sold $9 billion of bonds this year. French energy company Engie SA was second, having sold $3.8 billion of bonds. The European Investment Bank followed in third place, with $3.5 billion of issuance.

For an equity investor, the government issuers aren't too interesting, but what about companies such as Engie?

Equity ESG Screening

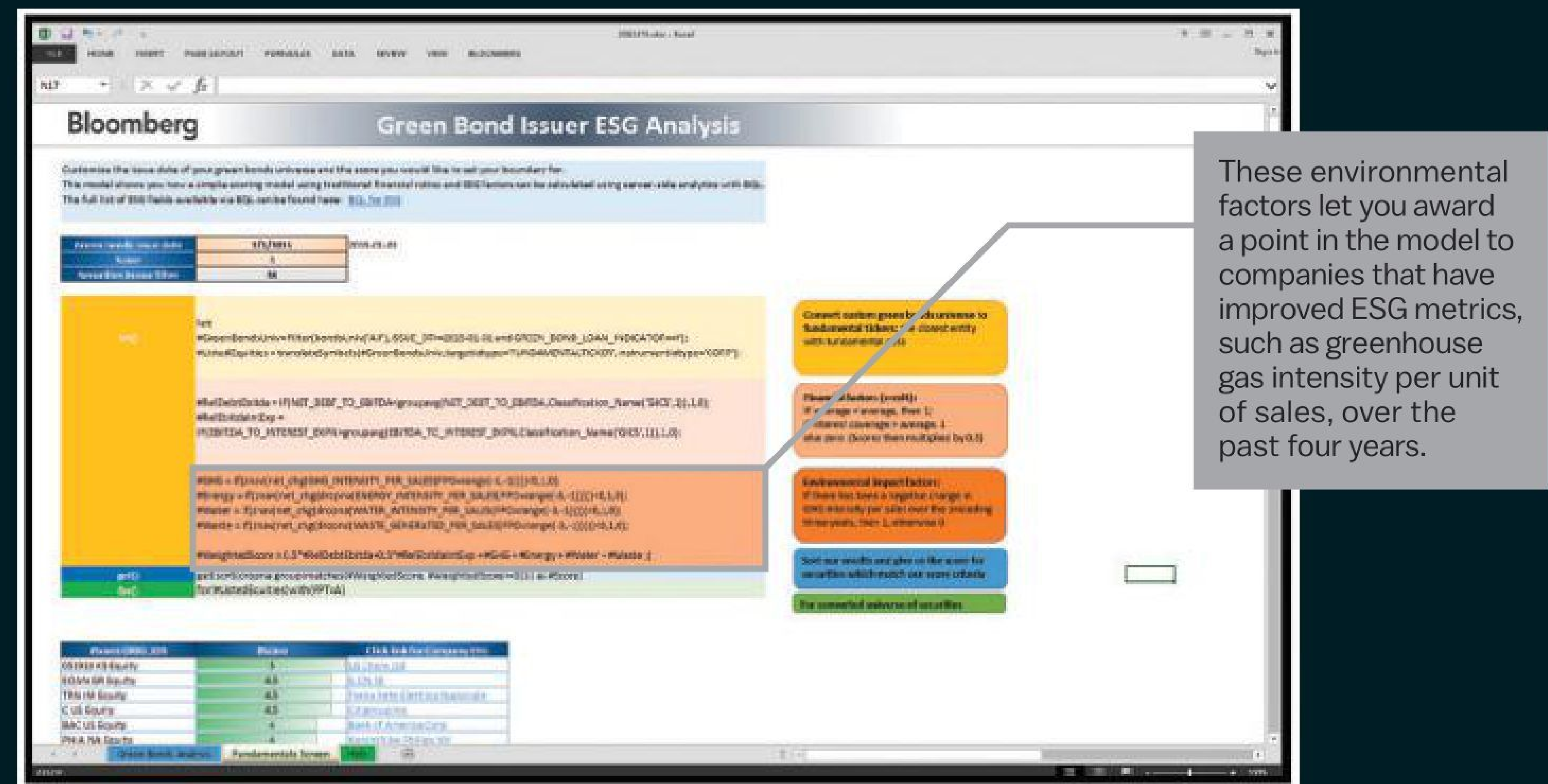
Click on the Fundamentals Screen tab. The first thing we're going to do is transform the list of green-bond issuers into a list of stocks. The light yellow section of the let() clause does that by getting the closest ticker in an issuer's corporate structure that has fundamental data.

Next, let's build a simple scoring model for these stocks. The model will look at two financial factors and at four environmental, social, and governance factors. It will award half a point for each of the financial metrics and one point for the ESG measures. A company can thus get a score of up to 5 points in the model.

What are the metrics here? A company can get half a point if its leverage is lower than the average in its sector and another

Fig. 1 To download a sample spreadsheet containing BQL formulas for analyzing green bonds and running a simple scoring model on stocks of their issuers, go to **{DOCS 2092476 <GO>}**.

Fig. 2 Click on the Fundamentals Screen tab for a BQL formula that transforms the list of green bond issuers into a list of stocks and lets you run them through an ESG and financial scoring model.



half point if its interest coverage ratio is higher than average. (To arrive at the half points, the financial scores of 1 or 0 are multiplied by 0.5 in the #WeightedScore variable.)

The ESG metrics are based on data captured and calculated by Bloomberg from annual reports. The first awards a point if a company's greenhouse gas intensity per unit of sales has decreased over the past four years, reflecting a reduced environmental impact. The same logic is then applied to three other factors: energy intensity, water intensity, and waste generated per unit of sales.

Finally, the get() clause returns the companies that score a 3 or higher in the model. The table below shows these companies: green-bond issuers ranked by ESG and financial performance. Perhaps there are some companies here that might merit further research.

GIVEN THAT ESG CONSIDERATIONS are a key theme for many investors, BQL can play an important part in your analysis. Other ESG-related tools you can explore include the Bloomberg Barclays MSCI Global Green Bond Index (GBGLTRUU Index), a benchmark bond index developed in partnership with MSCI ESG Research, and the Bloomberg SASB ESG Index family announced in September, which is a collaboration with State Street Global Advisors that offers investors ESG-weighted equity and fixed-income benchmarks.

Almost 1,000 ESG-related data fields are now available via BQL. To download the full list, go to **{DOCS 2092016 <GO>}**. For the library of BQL reference material, tutorials, and videos, go to **{BQLX <GO>}**. ●

Tong is a member of the desktop build group at Bloomberg in London.

Integrate Your Own Sustainability Scores Into Analysis and Reporting

By MATTHEW MCCARVILL

ASSET MANAGERS ARE increasingly incorporating environmental, social, and governance (ESG) metrics into investment decisions. Consider that 12 of the world's largest investors—including Allianz SE, Swiss Re AG, and Zurich Insurance Group—in September committed to make their investment portfolios carbon-neutral as part of the Net-Zero Asset Owner Alliance convened by the United Nations. That alone represents $2 trillion of assets deployed using ESG analysis.

You can find ESG scores on the Bloomberg terminal by loading a company ticker and running **{ESG <GO>}**. For example, go to **{BP/ LN Equity ESG <GO>}** for an overview of London-based oil major BP Plc (**FIG. 1**). The ESG Scores section of the screen displays metrics such as the Bloomberg ESG Disclosure score, a gauge of how forthcoming the companies are in providing ESG information. These ESG scores are tickerized so you can include them in your own multimetric analysis of a portfolio or watchlist.

LET'S SAY YOU'VE also built a model that calculates your own proprietary ESG scores. What if you want to include those in your investment screening process as well? No problem. You can use the Custom Data Editor (CDE) function to upload proprietary data. Your scores can then be incorporated into analysis on the Bloomberg terminal, displayed in custom reports, and shared with colleagues at your firm.

Here's how:

On the terminal, run **{CDE <GO>}**. Click Create Field on the red toolbar. Enter a name such as PROPESG in the Name field; press <GO> and it will also be assigned to the Mnemonic field. Select Number from the drop-down menu as the Content Type. Set the Periodicity to Daily. Click on the Create button (**FIG. 2**).

To assign values to a user-defined field such as this, you can use the Create New Note feature on the Bloomberg tab in Microsoft Excel to map your data to the field you've created. Or you can run **{BBU <GO>}** to use the Bloomberg Uploader for bulk uploads. Once you've created it, your custom data can be pulled into an Excel sheet or a monitor using the mnemonic, which in this case is UD_PROPESG.

To share the data, click the Manage button on the red toolbar in CDE and select Share Fields. Note: CDE fields can be shared only within the creator's own firm. User-defined data can be tapped in functions such as Portfolio & Risk Analytics (PORT), Equity Screening (EQS), Fixed Income Search (SRCH), and Worksheets (W) running in Launchpad, as well as in charts and in analysis using Bloomberg Query Language, or BQL.

You can use CDE fields to auto-populate custom reports built within the Bloomberg tab of Microsoft Word, which you can publish for internal consumption (**FIG. 3**). In Excel, the Bloomberg tab lets you publish and share sheets that use a combination of custom and third-party data.

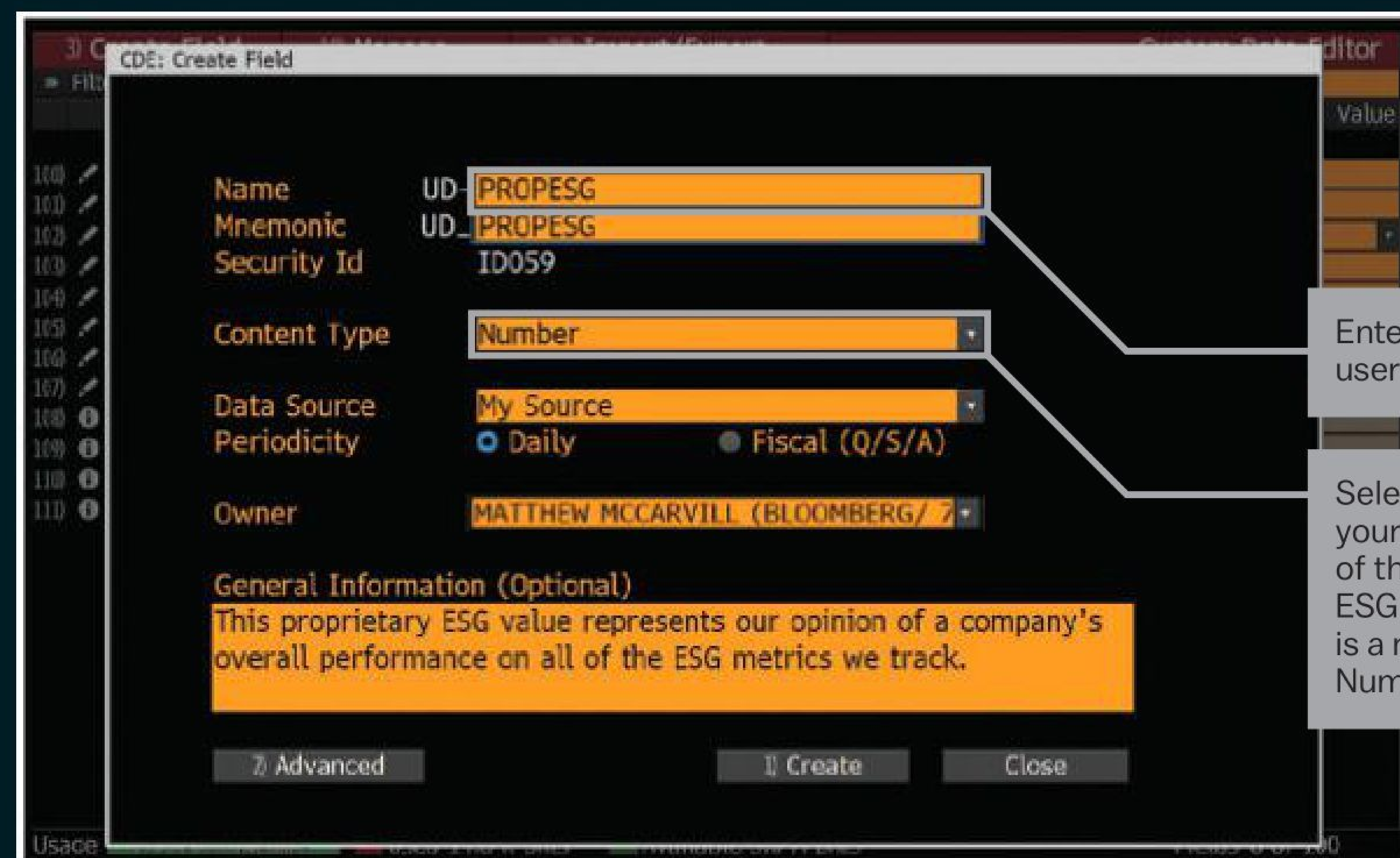
These tools, which are part of Bloomberg Research Management Solutions, enable your firm to maximize the use of internal research and manage broker research while staying compliant with regulatory requirements, including the European Union's Markets in Financial Instruments Directive II. ●

McCarvill is a Bloomberg Research Management Solutions specialist in New York.

Fig. 1 Run {ESG <GO>} for an overview of environmental, social, and governance data for a selected equity.

Hover your cursor over a score, such as this Bloomberg gauge of a company's ESG transparency, to find its Field ID so you can use it in your analysis.

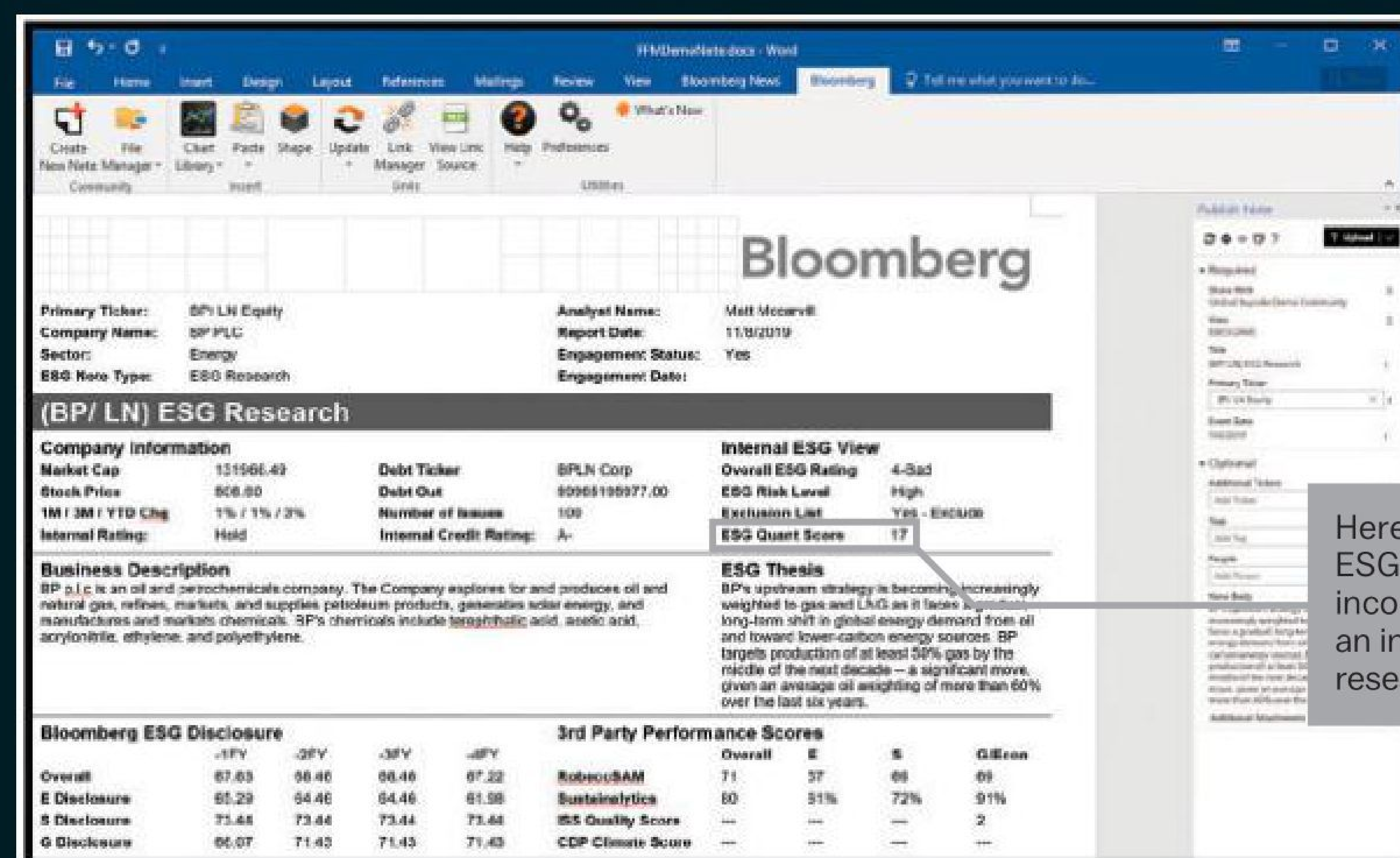
Fig. 2 Go to {CDE <GO>} and click on the Create Field button to create a custom data item.



Enter a name for your user-defined data.

Select the type of your data. In the case of this proprietary ESG score, the score is a number, so select Number.

Fig. 3 When you create reports or notes in the Bloomberg tab in Microsoft Word, you can draw on your custom data.



Here, the proprietary ESG score is incorporated into an internal research report.

Track Date-Driven Data to Spot Potential Risk

By JESSICA BEATUS and ZHUO ZHANG

Fig. 1 Run **{EVTS}** for the Events Calendar function. Once you set up a search, click on the Export button on the red toolbar to export to Excel, Outlook, or a PDF.

Click here and select New Search to set up and save a search for events important to you.

To see dividend ex-dates for your list of securities, tick this box.

"C" indicates dates that are confirmed and "E" means dates that are estimated by the Bloomberg Dividend Forecasts (BDVD) team.

WHAT DO CALENDAR DATES have to do with risk? A lot, of course. The biggest price swings in stocks and equity options are often tied to earnings and dividend dates.

On the Bloomberg terminal, the Events Calendar (EVTS) function is your one-stop shop for important dates such as earnings releases and other corporate events. Now, EVTS has been enhanced to help you stay on top of dividend ex-dates as well.

When a company declares a dividend, it specifies a record date. If you're the holder of record as of that date, you get the dividend. The ex-date is typically one business day before the record date, per Securities and Exchange Commission regulations. If you buy the stock on the ex-date or later, then you won't receive the dividend because the trade will settle after the record date. If a dividend is significant enough, the price of the stock may fall by a similar amount on the ex-date. Keeping track of ex-dates is thus important—especially for options traders.

LET'S TAKE A LOOK at earnings releases and dividend ex-dates for members of the S&P 500 index, for example. Type "events" in the command line and select EVTS-Events Calendar in the list of autocomplete matches. The shortcut is **{EVTS <GO>}**.

The filters and search functionality in EVTS let you drill down to the dates, lists, and event types that interest you. First, use the drop-down menu in the upper left corner of the screen to select New Search. In the amber field below Securities, enter S&P 500 and click on the SPX Index item in the list of matches. (Alternatively, you can track your own universe, a portfolio or watchlist, say. Simply use autocomplete or click on the Source button to navigate to your list.)

The Date fields let you specify a time frame. Let's look at the next 30 days, for example. Use the drop-down menu in the field under Date to select that time frame.

Next, under Event Types, tick the boxes to the left of Earnings Release and Dividends. Doing this as of Nov. 18 pulled in 243 events for the 505 companies in the S&P 500 (**FIG. 1**). Dividend ex-dates listed in the calendar are either confirmed, marked with a "C," or estimated, "E."

When you have a search set up the way you want, click on the Save button in the upper right corner of the screen, enter a name, and click on Save.

Fig. 2 Go to **{AVGO US Equity BDVD <GO>}** to see BDVD forecasts for Broadcom for the next three years.

You can also use the Company Events (EVT) function to go directly to the events for a particular company. Go to **{AVGO US Equity EVT <GO>}** to see events for Broadcom Inc., for example. Broadcom is the fourth-largest maker of semiconductor devices by market value, after Samsung Electronics, Intel, and Nvidia.

San Jose-based Broadcom has progressively increased its payout on common shares since initiating its dividend policy in 2010. The Bloomberg Dividend (BDVD) team forecasts the company will raise its dividend when it announces earnings on Dec. 12. Run **{AVGO US Equity BDVD <GO>}** to see three years of BDVD forecasts for Broadcom (**FIG. 2**). BDVD projects the company will pay out $3.05 per share. That represents a 15% hike from the previous quarter, but it's more moderate than past increases. Broadcom's dividend rose 51% in one year, 76% over three years, and 56% over five years.

BDVD also forecasts that the ex-date will be the third Friday of December, or Dec. 20. As it turns out, that's also the expiration date for Broadcom monthly options, which grant the right, but not the obligation, to buy shares at a specified strike price. This year the company's dividend ex-dates have fallen both before and after option expirations.

WHAT'S BEHIND THE BDVD forecast? Outlining its capital allocation strategy in a November company presentation, Broadcom said it planned to distribute 50% of the prior fiscal year's free cash flow as cash dividends, deleverage its balance sheet, and maintain its investment-grade credit rating. The company had indicated on its third-quarter earnings call in September that it expected free cash flow to be approximately $9 billion, up 10% from 2018's free cash flow of $8.2 billion.

The BDVD forecast of $3.05 was higher than both the consensus estimate of $2.91 and the range of $2.31-$2.57 implied by the trading in options. If the company's dividend announcement matches BDVD forecasts, Broadcom will lead its peers, with a projected 12-month dividend yield of 3.9%, vs. an average 2.6% for its peers.

LET'S CIRCLE BACK to dates. To see the most active options on Broadcom shares, run **{AVGO US Equity OMST <GO>}**. Of the options expiring on Dec. 20, the contract with the highest open interest was the $340 calls. Shares closed at $311.07 on Nov. 18. ●

Beatus and Zhang are dividend analysts at Bloomberg in Princeton.

Brazilians Stretch for Yield And Get Stung by Unfamiliar Risks

By CRISTIANE LUCCHESI, FELIPE MARQUES, and VINÍCIUS ANDRADE

GUSTAVO POLETTO BOUGHT 200,000 reais ($50,000) of bonds issued by a Brazilian road company in 2015, lured by their high yields and tax-exempt status. His broker told him it was a once-in-a-lifetime opportunity. Now the 39-year-old radiologist from southern Brazil expects to lose it all.

His pessimism is probably justified. The company that sold the bonds, Concessionária Rodovias do Tietê, is trying to restructure its debt and says it has few prospects for fully repaying its creditors. While Poletto says he's learned his lesson, thousands of his fellow Brazilians remain enthralled by infrastructure bonds and other high-yielding debt. Many are in for a wake-up call.

"The risks in an infrastructure project can be very large," says Jean-Pierre Cote Gil, a portfolio manager and head of credit at Julius Baer Group's family office in Brazil. "For a retail investor it's difficult to analyze, understand, and put a price on that risk."

Brazilians are taking on more risk for a simple reason: Record low interest rates are forcing them to find higher-yielding alternatives to their traditional go-to investments of Treasury bonds and bank savings accounts. But newcomers are often unfamiliar with the vagaries of the local corporate bond markets, where it can be tough to recover losses or sell securities.

Infrastructure bonds use the cash flow from a project, such as a toll road or bridge, to repay investors. Riskier projects should, in theory, pay higher premiums over Brazilian government securities, providing attractive yields. Infrastructure bonds are also tax-exempt for individual investors, adding another enticement. "Brazil gave retail investors the incentive to buy this type of bond, but we know that they usually don't analyze a project in detail—they're going to rely on a report they read or a recommendation," says Cote Gil, who's been analyzing credit risk for more than 20 years.

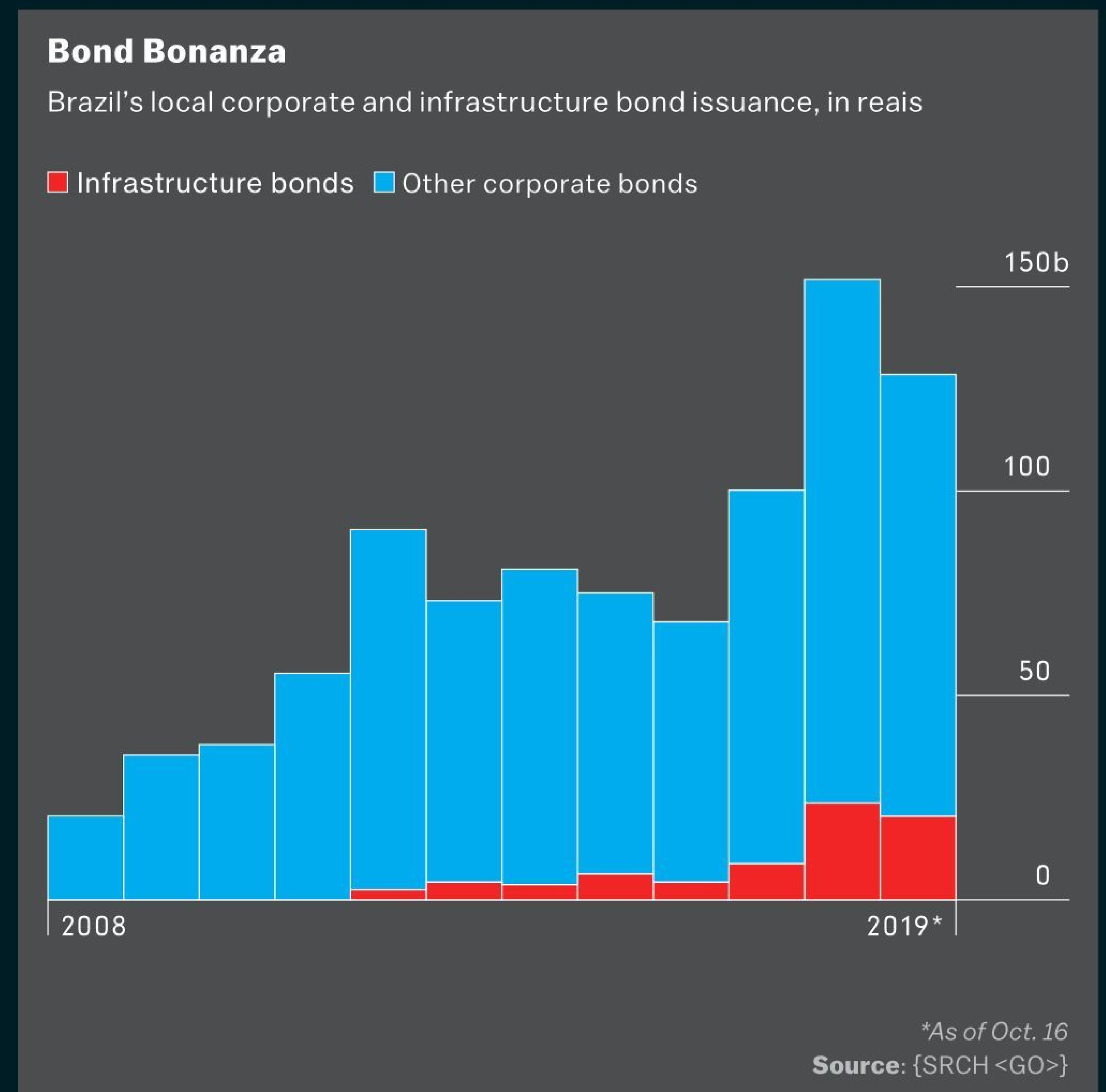
Some asset managers in Brazil have become concerned about how popular these bonds are with retail customers. Since the infrastructure debt program started in 2012 through October, about 75.5 billion reais of the bonds have been issued, according to Bloomberg data. Among the firms expressing concern is Quasar Asset Management. Founding partner Carlos Maggioli said in a tweet in October that investors shouldn't buy new infrastructure bond issues because the spreads don't adequately compensate for the risk and duration.

Why are asset managers worried? Credit is a fast-growing asset class in Brazil. Funds investing in corporate debt held about 15 billion reais in assets in 2014. That figure surged to almost 100 billion reais in June, or about 2% of the total 5 trillion-reais fund industry, says Alexandre Muller, a partner and portfolio manager at JGP Gestao de Recursos Ltda., one of Brazil's biggest independent asset managers. He contrasts that with the U.S., where bond funds represent closer to half of total assets. "So, there's a lot of room to grow," in Brazil, Muller says. However, credit fund managers want to nudge the market away from problems that could sour investors on the asset class.

RETAIL INVESTORS ARE often oblivious when a bond deal is failing. That's because brokers typically report the face value of the bonds when providing client balances, so a default that brings the value to near zero can seem to come out of the blue, according to Muller. "We are making a huge effort to improve transparency and mark-to-market processes for most bonds so they have a fair price—one that can be confirmed in real trades," he says. JGP acts as a price provider for bonds, a role usually played by a broker or bank. That's partly to improve market transparency, Muller says, but also because JGP's own funds need a reference price to trade well.

In Brazil, JGP is a pioneer in credit funds, which account for 3 billion reais of the firm's 20 billion reais of assets under management. Muller says JGP's funds have become one of the biggest credit market makers in Brazil, with about 5% of the total trading volume, by offering for free a service for which banks charge as much as 20,000 reais a month. "Banks here have no interest in improving the secondary markets, because they earn money otherwise," he says. "We do so to protect our own portfolio." JGP has also created a database and

Fig. 1



launched an index called Idex-CDI JGP, which follows the approach JPMorgan Chase & Co. used for its emerging market bond indexes.

Such efforts are starting to have an effect. The total amount traded this year through Sept. 13 almost doubled from the same period last year, to 98 billion reais, according to JGP data.

The structure of the market in Brazil can sometimes contribute to big price drops after a bond is issued. How this situation arose is a little complicated, but it derives from the historical thinness of secondary credit markets. Traditionally, most local bonds were bought by banks and held on their balance sheets to maturity. In fact, to this day, many companies take out loans, but book them as bonds as a way to avoid taxes. In the past, about half of local bonds were actually these bank loans "in disguise," a percentage that's now down to about a third, Muller estimates. Pricing was an opaque process in which banks would name a figure at which they would commit to buy the bonds, without any particular effort to gauge market appetite.

Fast forward to today: Dutch auctions are now the most widely used method of pricing bonds in the primary markets—the price is set based on the highest level at which the whole offering can be sold. Bank underwriters, though, continue to operate much as they used to. They commit to buying bonds at prices that may be informed by a commercial relationship with an issuer rather than demand. The difference now is that instead of holding to maturity, the banks sometimes bid up offering prices, scoop up a chunk of the bonds, and turn around and offload them. Many "start selling the bond on the day after, pushing prices down and creating losses for funds that bought along with them to hold on to the bonds," Muller says. Banks in Brazil earn more from underwriting and by doing those types of "flipper trades" than by creating a healthy secondary market, he says.

Reference prices and indexes are changing that. Many investors are simply refusing to buy bonds in the primary markets when prices are too high compared with others. To protect its funds, JGP enters a new offering only when at least 20 other investors participate and banks wind up with no more than 10%.

The tax exemption on infrastructure bonds, while attracting investors, also adds hurdles for issuers that run into trouble. Typically when a borrower can't make its payments on time, the solution is to swap the defaulted debt for a new longer-term, lower-coupon bond. But with Brazil's tax-exempt securities, such modifications could need government approval, according to Julius Baer's Cote Gil.

One alternative would be to change the terms of the existing bond. But that can be even more difficult to get done. In the case of Rodovias do Tietê, for example, changing the bonds would require holders of 90% of the debt to attend a meeting and approve new terms. If that fails, 100% of those present at a second meeting must vote in favor. Muller, for one, is calling for changes to the tax exemption, citing a proposal to grant it to the issuers, which could use it to offer higher yields to all investors.

ONE MORE HIDDEN RISK lies in wait for the credit fund industry. About half the funds promise investors they can withdraw their money on the day of a redemption request or one or two days after. Yet many are investing in illiquid debt to improve returns and beat their indexes as credit spreads tighten. One potential solution, according to Cote Gil: Funds should include a lock-up period, which would help filter out clients that lack staying power. Otherwise, when a crisis comes, investors who ask for their money back will post huge losses or simply won't be able to get it, he says.

Roberto Sallouti, chief executive officer for Banco BTG Pactual SA, says his biggest concern can be boiled down to one word: suitability. "If we don't take care with that, we could simply sabotage the market's growth from its birth," he says.

It's probably already too late for one investor—Poletto, the radiologist who bought those road bonds that are in distress. "I'm never investing in local bonds again," he says. ●

Lucchesi, Marques, and Andrade are reporters at Bloomberg News in São Paulo.

Local Government Financing Vehicles

This $1.2 Trillion China Bond Market Is Studded With 'Fakes'

By TONGJIAN DONG

ONE CORNER OF CHINA'S bond market is offering yields that seem too good to be true. And, indeed, it's permeated with "fakes."

Since 2009, off-balance-sheet shell companies set up by Chinese municipalities have been selling debt to fund infrastructure projects. Called local government financing vehicles, or LGFVs, they were initially intended to supplement the stimulus Beijing launched to rescue China's economy after the 2008 credit crisis. In the past 10 years these vehicles have amassed a huge pile of debt: 33 trillion yuan ($4.7 trillion), according to S&P Global Ratings. Of that, about 8.3 trillion yuan, or $1.2 trillion, is in bonds.

Yields on these securities tend to be attractive, especially in a world where $12 trillion of bonds have negative interest rates. Because they're not part of the municipalities' budgets, LGFVs typically offer higher coupons. The average coupon of outstanding LGFV notes was 3.9% in October, while the average for yuan-denominated corporate bonds was 3.0%, according to data compiled by Bloomberg. Of China's 3.6 trillion yuan of bonds that paid more than 6% at the end of September, about 45% was issued by LGFVs.

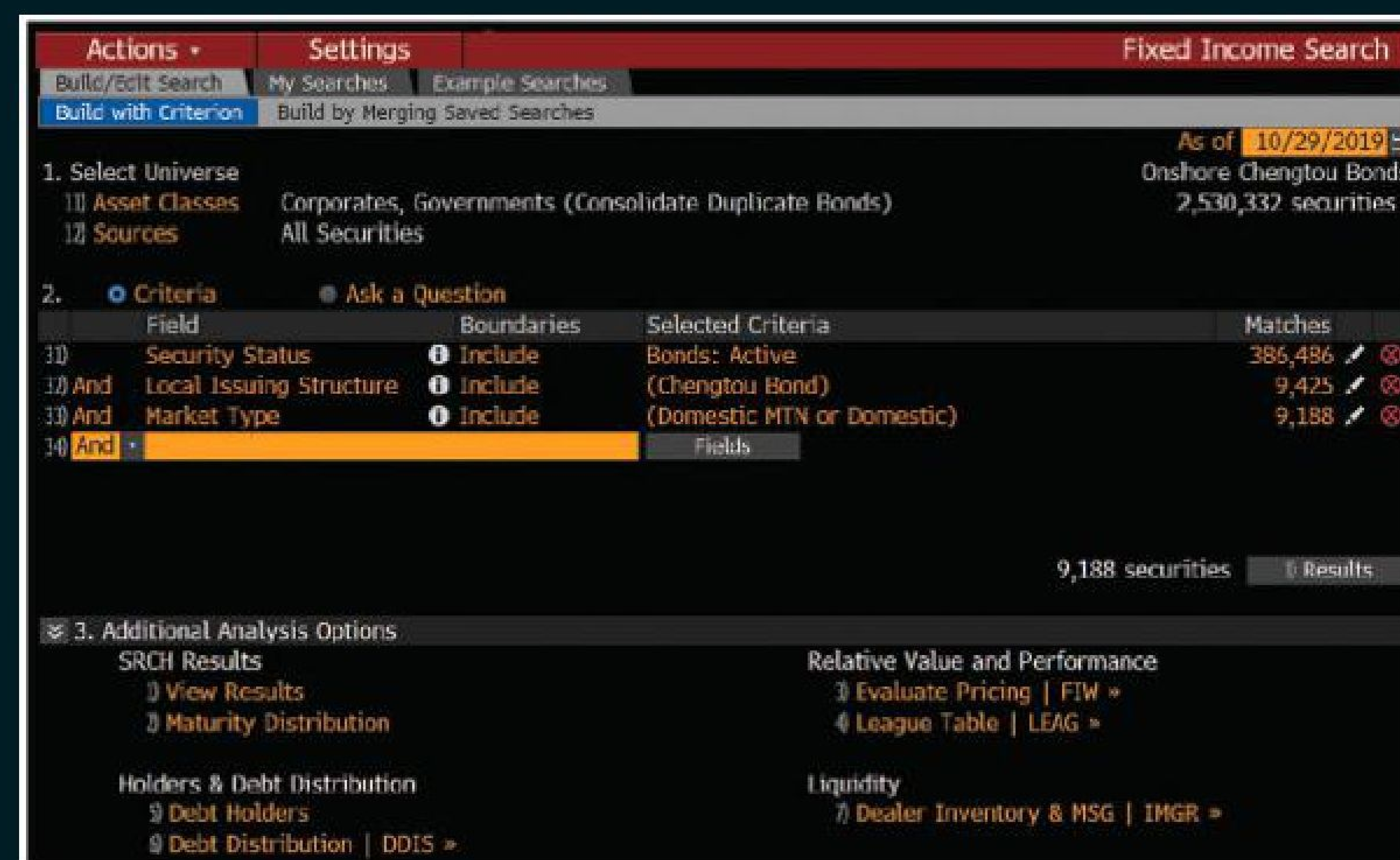
Beijing started allowing some state-owned enterprises to go bust in 2015, yet not a single LGFV bond has failed to satisfy its obligations, despite scant cash flow and mounting debt. There have been some close calls, though. In August 2018 an organization attached to the army in China's western Uighur region missed a deadline to repay its bond by two days. Such "technical defaults"—slightly delayed wire transfers—have become more common since.

Still, LGFV bonds are now seen as one of the most desirable assets in China. Strong demand from foreign fund managers has pushed LGFV dollar-bond sales to an all-time high this year. Along with their attractive yields, the bonds' appeal stems from investors' view that they're low-risk. The reasoning here, while a little convoluted, goes something like this: Local governments' fiscal revenue is growing at the slowest pace in at least a decade, thanks to corporate tax cuts and an economic slowdown. Yet spending on infrastructure is still needed in many parts of China, giving Beijing an incentive to keep this financing channel open—which means preventing LGFV defaults.

But there's a major problem: Many LGFVs are no longer sticking to their construction mandates. Investors call them fakes.

As early as 2010, Beijing asked municipalities to refrain from borrowing funds for construction projects that would rely on repayment from the central government. As a result, many LGFVs pushed into new businesses to generate cash. Some have gone rogue, ditching underappreciated public services altogether. One example is Changde Economic Construction Investment Group Co., whose

Fig. 1 To find LGFV bonds—debt issued by Chinese local government financing vehicles—run **{SRCH @CHENGTOU <GO>}** on the Bloomberg terminal.



original focus was funding urban construction projects in Changde city in central Hunan province. Now it's set up businesses in five sectors, including tourism and financial services. In local parlance, these types of LGFVs that don't finance infrastructure or social welfare projects are referred to as fakes.

Qin Han, chief fixed-income analyst at Guotai Junan Securities Co., says LGFVs that engage in funding railway, superhighway, or shantytown renovation should be safer investment opportunities because they're more likely to get government support. "It is because funding borrowed for such projects is likely to be supported by top regulators' debt workout policies," Qin says, "as well as money granted by financial institutions to ease liquidity crunch, if there is any." As for "fake" LGFVs, Beijing will let a few go bust sooner or later.

Nasty surprises can emerge. Qinghai Provincial Investment Group, for example, was long considered an LGFV by at least some bond investors. When the aluminum maker made late coupon payments in February and again in August, doubt surfaced. S&P Global Ratings said in a March report that Qinghai Provincial should be viewed as a state-owned enterprise rather than an LGFV because it doesn't carry out significant public welfare activities. "The company's weak standalone credit profile is primarily due to its high production costs, weak competitive position, sector cyclicality, and high financial leverage," the rating agency said.

In times of distress, demand for LGFV bonds can freeze suddenly. Case in point: In June, after its first bank seizure in a decade, China experienced a liquidity squeeze in the opaque repurchase market, where financial institutions offer bonds as collateral for short-term cash loans. Banks rejected many high-yield issues as collateral, including LGFV bonds, because they didn't know their real worth. To drum up demand, issuers of as much as 8% of China's corporate bonds had indirectly purchased a portion of their own bonds. Roughly half of new LGFV bond issues were privately placed, according to Bloomberg data, making it hard to know the ultimate owners.

Few LGFVs are profitable. Instead of analyzing cash flow, investors look for traces of government support to justify buying these securities. Over time, though, more and more LGFVs that aren't funding infrastructure or social welfare projects will be called out. Amid China's deleveraging drive, some LGFVs have reneged on obligations on trust loans. Investors need to weigh whether this debt could be a bomb that will eventually blow up on them. ●
—*With Shuli Ren*

Dong covers China credit at Bloomberg News in Shanghai.

The Clock Is Ticking on Libor. Here Are Some Tools to Help You Get Ready

By KEVIN SINCLAIR

THE BANK OF ENGLAND started the countdown on retiring the scandal-plagued London interbank offered rate in 2017. That was when Financial Conduct Authority Chief Executive Officer Andrew Bailey announced that the regulator would, at the end of 2021, no longer require banks to participate in the Libor panel. The idea: Since being on the rate-setting panel offers little upside and entails big risks for rogue behavior, contributors would step away, and the market would be forced to find another benchmark.

There are alternative "risk-free rates," of course. For example, the U.S. federal funds rate and the euro overnight index average, or Eonia, represent overnight unsecured borrowing between money-market participants. Such rates underlie well-developed derivative products, called overnight index swaps. The equivalent in British pounds is the sterling overnight index average, or Sonia (ticker: **{SONIO/N Index}**).

The Bank of England's endorsement of Sonia as its preferred replacement for British pound Libor was marked by a landmark event in midyear. On June 11, bondholders approved the first benchmark switch of a Libor-linked public instrument, voting to change the coupon of a floating-rate note issued by Associated British Ports Plc to Sonia plus 264.8 basis points, from three-month GBP Libor plus 250 basis points. The larger margin is compensation for the fact that as an overnight rate, Sonia fixes lower than three-month Libor.

In the U.S., the Alternative Reference Rates Committee recommended that a newly created rate—the secured overnight funding rate, or SOFR—replace USD Libor. The New York Federal Reserve Bank began publishing SOFR in April 2018. This rate is based on overnight repo transactions with U.S. Treasuries as collateral, which can lead to supply and demand dislocations in the underlying repo market, as happened in late September. The first SOFR swaps traded soon after the rate was launched. To track SOFR swap trades reported under Dodd-Frank rules, go to **{SDR <GO>}** for the Swap Data Repository Trade Activity function. Use the Source drop-down to select the Depository Trust & Clearing Corporation. Then click on the Rates tab and on the SOFR subtab. You can also trade SOFR swaps electronically by running **{BBTI <GO>}** for the IRS Trading Portal (**FIG. 1**).

In Europe, the situation is a little more complicated. The European Money Markets Institute, the industry body that administers both Euribor (the euro equivalent of Libor) and Eonia, decided to amend the methodology for constructing Euribor to include some transaction data. The EMMI also sought approval for Euribor under the EU's authorized benchmark regime, which was granted in July. After consulting the market, the EMMI decided that Eonia was beyond saving. A new rate administered by the European Central Bank called the euro short-term rate, or ESTR, was launched on Oct. 1. Eonia will still be published, but its methodology has changed: It's now at a constant fixed spread of 8.5 basis points to ESTR. EU regulation decrees that no unauthorized benchmark can be used in new trades after Jan. 1, 2020. That would bar new Eonia swaps, but an exemption until 2022 was granted in February.

WHEN IT COMES TO derivatives, the devil always lurks in the details. In a traditional Libor coupon in a swap, the fixing occurs at the beginning of the period, so the size of the cash flow for the payment at the end of the period is known well in advance. But for swaps based on these new overnight rates, the coupon is calculated by daily compounding of the underlying rate. As a result, the final rate for the payment won't be known until the day before it's due. That can cause problems. (For help with this calculation, run **{EONC <GO>}** for the Index Compounding Calculator.)

The bond market has experimented with different approaches to this problem. In May, Goldman Sachs Bank USA introduced a SOFR bond that shifted the period over which the daily rates were compounded back by two days. Morgan Stanley priced a SOFR bond in June that implemented a two-day payment lag, matching the SOFR swap convention.

So what do you need to do to prepare for the transition away from Libor? For a start, run **{RFR<GO>}** for a landing page with an overview of Libor transition solutions. Go to **{SWPM <GO>}** to price swaps based on the new benchmarks with the Swap Manager function. As these markets become more liquid, the curves used to price trades will become more detailed.

Information on new futures contracts launched by exchanges can be found on the Contract Table Menu function by running **{CTM <GO>}**. **{SOFR <GO>}** and **{ESTR <GO>}** provide further resources. New rates mean new discount curves, and therefore new valuations, for your derivatives. Clients are using Bloomberg's MARS API to programmatically assess the change in present value that a repapered credit support annex might cause. For more information, run **{RISK <GO>}**.

Swap pricing and other new features relating to Libor replacement will automatically flow to AIM and TOMS, Bloomberg's order management systems for the buy side and sell side, respectively.

Fig. 1 Go to **{BBTI <GO>}** to trade SOFR swaps or other instruments based on Libor replacement rates.

Fig. 2 Run **{YAS <GO>}** to analyze a selected bond with a floating-rate coupon based on one of the replacement rates, such as Sonia.

Click here to display the compounding schedule for a risk-free-rate-based floater.

Clients can also set up alerts using **{ALRT <GO>}** to notify them when a bond in their portfolio is marked to begin the change in coupon process. Bloomberg's securities database is being upgraded to enable clients to check what fallback conditions their floating-rate notes might already have in the documentation. You can see this on the DES screen for a security by clicking on Coupons and then Bmrk Fallback on the gray toolbar. The Yield and Spread Analysis function shows the compounding schedule for RFR-based floaters. Run **{YAS<GO>}** for a selected bond and click on Coupon in the middle of the screen (**FIG. 2**).

The International Swap Dealers Association began a third consultation process in September asking about the fine details of the process for the fallbacks used when Libor is no longer published. This will be implemented as a global change to the ISDA 2006 Definitions, the terms that underpin the documentation of the vast majority of interest-rate swaps. As a result, it probably won't be necessary to negotiate each individual swap. Be that as it may, there's no room for complacency.

New York Fed President John Williams, in a speech in September, admonished market participants to prepare for the coming changes. "Some say only two things in life are guaranteed: death and taxes," he said. "But I think there are three: death, taxes, and the end of Libor. I cannot emphasize enough that the clock is ticking, and everyone needs to get their firms ready for Jan. 1, 2022." ●

Sinclair is a sell-side implementation specialist at Bloomberg in London.

The World's Second-Largest Insurer Becomes a Tech Giant

By BLOOMBERG MARKETS

PHOTOGRAPHS BY QILAI SHEN

Tan

JUST 31 YEARS AFTER it was founded in China's southern city of Shenzhen, Ping An Insurance (Group) Co. has grown into the world's second-largest insurer by market value after Berkshire Hathaway Inc.—more valuable than Allianz SE and AIA Group Ltd. combined. A financial supermarket that offers insurance, asset management, banking, and trust services, Ping An (which roughly translates to "safe and well") added a focus on technology in the wake of the financial crisis. Now it has five groups of internet platforms, which it calls ecosystems, focused on finance, property, automotive, health care, and services for the "smart city." More than 576 million users and 100 Chinese cities are connected to at least one of those ecosystems. One of the businesses, Ping An Healthcare and Technology Co., which runs the health-care portal Good Doctor, has already listed separately. Shanghai Lujiazui International Financial Asset Exchange Co., the unit that manages the finance website Lu.com, postponed a planned public offering in 2016 when the government cracked down on peer-to-peer lending. Ping An has started licensing technology to peers at home and abroad. Below are excerpts from *Bloomberg Markets*' September interviews about the company's strategy, conducted separately with two of Ping An's co-chief executive officers, Lee Yuan Siong and Jessica Tan.

BLOOMBERG MARKETS: How will technology change Ping An in the next decade?

JESSICA TAN: For technology, we have a three-step path. The first is to enable finance with technology, using technology to very aggressively innovate our business model from sales to risk control and operations, which we've been doing in the past 11 years. The second step is to use technology to enable the ecosystems, targeting either consumers or businesses and the government. Then it's the ecosystems nurturing finance when they've reached a certain size, but that takes some time. That's started, especially

in terms of new-client acquisition, as it's an area where we started out early. But the real benefits here have yet to show themselves.

In 10 years we'll just become a "technology-plus-finance" company. We're already starting to show that. Technology's contribution to revenue remains small to the company now, even though it's already a big number—38.4 billion yuan [$5.4 billion] in revenue in the first half of this year from the 11 tech companies. But when we do better at the second and third steps, the contribution from technology will become bigger and bigger.

BM: How does Ping An's tech measure up with that of competitors around the world?

JT: We now have 32,000 researchers, a combined 101,000 tech staff at the 11 tech units, more than 20,000 patents—96% are invention patents—and eight research institutes. In terms of input, our technology strength is unparalleled among financial institutions.

Even compared to globally leading technology companies, we're often even stronger in the area of finance. Some of our technologies are rarely seen or even impossible to find among financial institutions globally. Ping An OneConnect's [fintech and cloud computing] products domestically are being used by 618 banks, 84 insurance companies, and nearly 3,000 other nonbanking financial institutions. In seven overseas markets, there are about 27 financial institutions using them, and most of them are relatively large financial institutions. So I believe we're very competitive here.

Siong

BM: What is the response to Ping An's technology in the rest of Asia?

JT: There's a lot more demand than we expected. When OneConnect set up its overseas office [in Singapore] about one year ago, we thought a small office would do. Now it has more than 200 full-time employees [in Singapore, Indonesia, and Thailand].

At present, demand is particularly strong in three areas. One is SME [small and midsize enterprise] financing, which is a very hot topic at home and abroad. Our advantage here is that we have the technology to truly aggregate many data to create risk profiles of small and medium-sized businesses. And since we're a financial company ourselves, financial companies believe our model can work. And even if you don't trust me, I can do it myself with my own money.

The second one is personal finance, another area with very, very strong demand. The third area is efficiency improvement. Asia, in many places, still depends on people for sales, but we have a lot of sales management tools.

We've done this ourselves. I can improve the productivity of 1.4 million agents; we absolutely can improve it for your people. As long as financial institutions want to do it, we're a very good partner.

Many people are worried that we're competing with the local financial institutions, because Ping An has a reputation domestically of being strong. I would say, "Look, I'm just an enabler."

BM: How many potential unicorns are there in the company's incubator, and what do they do?

JT: It's hard to say. Whether it's 11 or any other number is not important. What's more important is we do our job around those five areas [finance, health, auto, property, and the smart city]. For finance, Lufax and OneConnect are the main ones. One serves clients directly and the other enables the entire market. I guess there won't be new ones. OneConnect will have more modules, while Lufax will become more and more efficient, with its wealth management robot popularizing wealth management services.

The reason we now have 11 tech units is a management decision. It's actually very hard for a company as big as we are to keep innovating and stay nimble. We encourage the use of small teams to try things out while coordinating among themselves with clear positions for everyone.

BM: How much more can the insurance business do to achieve cost savings, efficiency improvements, and other value creation from technology?

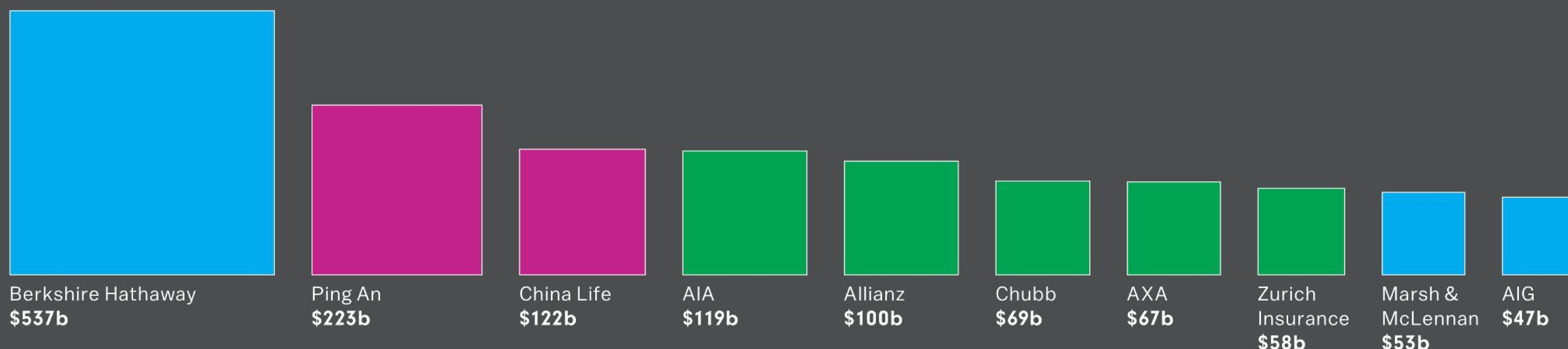
LEE YUAN SIONG: Using new technology to empower our business is a never-ending journey. We started earlier than others, have done more, and gone further, but that doesn't mean we're already close to the end. What we need to do is to always keep ahead of peers—moving faster and further, with them chasing behind us.

In terms of specific indicators, our life insurance business, including internal management, is already 93% online and paperless. We can hit 100% within a year, but being online and paperless is no end to the application of technology. The four main business lines of property insurance are about 90% online and paperless and could also achieve 100% within a year. ►

A Distant Second

Largest publicly traded insurance companies by market value* and nation of domicile

U.S. China Other



*As of Nov. 15, 2019

Source: {WATC <GO>}

After moving online, you can accumulate massive data as every step leaves a data trail. Then you can digitalize, with data guiding your decisions for business operations, management to services, sales, and risk control. The third step is using AI to make judgments and decisions. We've seen clearly the benefits, and we're just taking action to realize them in every aspect of the business.

We're pushing the group as well as the business units to, within 18 to 36 months, achieve full digitalization—with data driving management decisions at every step. We've been employing artificial intelligence in various scenarios for intelligent management, such as in auto claims settlement, pricing of property insurance, as well as the interviews of agents.

The value can be seen in many ways, from enhanced customer satisfaction to better risk management and higher efficiency. Our auto insurance combined ratio is 3 percentage points lower than the industry's, which is a long-term and direct impact. The nonperforming ratio of our loans is also very low.

BM: You've said Ping An is undervalued because investors are underestimating the value of your technology. Could there be risks that investors are seeing but you aren't?

LYS: We've been building an integrated financial-services model, which is different from the universal banking seen abroad and has achieved very good results. From the growth in the number of clients and profit per client, you can see it's actually a very successful model. We've been telling the capital market to see our potential value in the growth of our clients and per-client profit. That's starting to be accepted by the market.

The ecosystems are an upgrade of our entire technology segment. That includes the listings of the units, the tech products, which create direct value. Besides that, when the ecosystems enable our integrated financial services, it creates additional value and should add a premium to the valuation of our integrated financial services.

Almost one-third of our new clients come from the ecosystems, and that's why our client number keeps rising, to 196 million. Profit per client keeps rising and the number of products per client keeps increasing, too.

The ecosystems are not yet included in the valuation models in the capital market. The value of the integrated finance is partly reflected—so the value of the core business isn't fully reflected, either. So every segment has room. As to how much room, I won't give guidance. It's up to the capital market to assess.

BM: How will autonomous driving affect auto insurance?

LYS: It will have a relatively big impact on the current business conditions of auto insurance, which we must admit. How it's going to change depends on, firstly, the advance of technology, and secondly, how the legal environment adapts to autonomous driving: how to assign responsibility when accidents occur—who's responsible and how big is the responsibility. It's going to change auto insurance, but it's also going to bring opportunities, such as liability insurance.

BM: How does Ping An compete with online insurance offerings from tech companies?

LYS: Indeed, a lot of interpersonal communications and transactions are now taking place online, and that's why we are moving onto the internet. We have massive offline forces and networks, but we've already moved online.

Our life insurance Jin Guan Jia [or "golden housekeeper"] app has 220 million users. The property insurance unit's Ping An Auto Owner app has more than 70 million users, and even the small health insurance unit has 10 million app users, and Lufax has more than 40 million users. So while we have huge offline forces, we're actually very much internet-based already, with communication and interaction between clients and our agents, service staff, and managers taking place online highly efficiently.

We focus on finance and health, and have deeper understanding about client needs in those two domains than pure e-commerce, social, or news-oriented internet platforms do. With our huge internet presence, our offline service networks are actually an advantage.

We're changing every year. When younger generations born after 1990 and 2000 become the main consumers, financial institutions need to understand how to interact and communicate in ways they like. So we're prepared for the competition. There was simply no other option. ●

AI Generates Faster and Smarter Earnings Reports

By ALEX WISCH

Fig. 1 This story appeared three seconds after Nike reported first-quarter earnings. Bloomberg Automation stories run in the regular news feed for a given company.

THREE SECONDS. That's how long it took Bloomberg to produce a story on Nike Inc.'s first-quarter results on Sept. 24.

That first article included all the key takeaways: Earnings per share of 86¢ beat even the highest estimate from analysts; the 45.7% gross margin exceeded expectations; and the 22% jump in revenue from the greater China region, to $1.68 billion, also topped forecasts (**FIG. 1**).

The author? Bloomberg Automation, a highly sophisticated algorithm that scrapes the important figures from earnings releases and produces a digest of comparable metrics. Bloomberg now covers about 7,500 companies globally with semiautomated earnings stories.

To create this Journalism 2.0, seasoned reporters and editors work hand in hand with engineers. Programming the algorithm requires specialized industry expertise. Take the energy sector. To build coverage, the team first isolated 129 companies in the sector that report their earnings. Then they examined the companies' releases to extract common metrics, themes, and reporting techniques that went beyond the standard EPS. Last year earnings stories on these companies had an average of 4.7 data points and contextual bullet points. This year they have 13.4.

In addition to speed, the aim is to provide insight. Computers can cross-reference enormous data sets to capture the most relevant metrics. And robust data relating to company financials means there are more ways to understand what's happening at companies. Data from the Analyst Estimates and Models (MODL) function, for example, helps capture comparisons against consensus estimates from analysts' models, such as those for Nike's regional sales. MODL was the source for reporting that the company's Chinese growth strategy exceeded analyst expectations in the first quarter.

Automation frees up Bloomberg News's reporters to find out more about what's behind the numbers or to dig into outliers. They often deliver updated stories within minutes.

Ultimately, the goal of Bloomberg Automation is to help you spot news you can act on. For more information on some of Bloomberg's other insight-generating rules and themes, type "help BAI" in the command line of a Bloomberg screen and press <GO>. ●

Wisch is a market specialist for news at Bloomberg in New York.

Use Fixed Income Worksheet to Find Liquidity in Bonds

By STEVEN GEE and NICOLE JAGERNAUTH

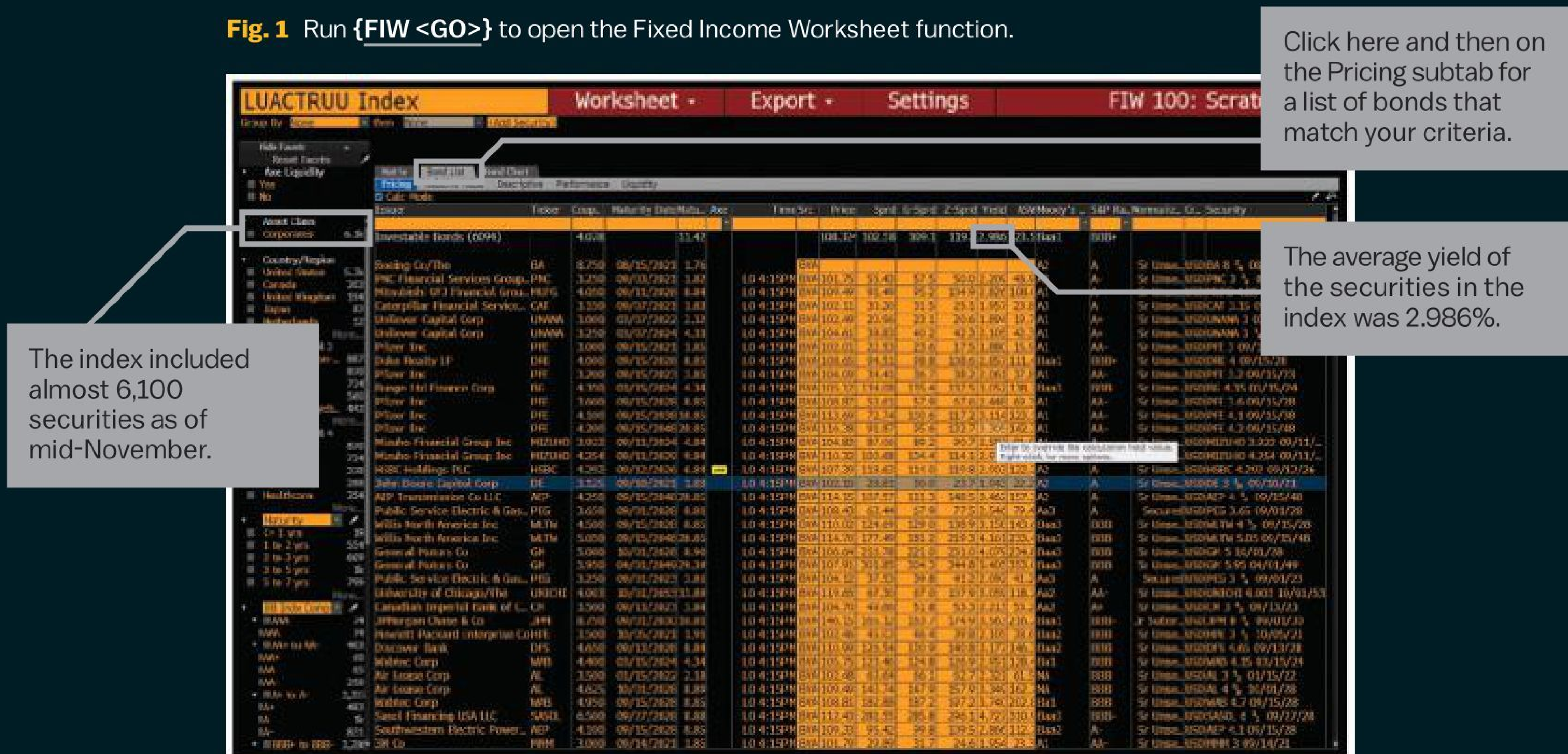
IF YOU'RE A BOND ANALYST or portfolio manager working on shaping the profile of your investment portfolio, you need to assess the liquidity of bonds you target to buy or sell. To do that, you can use the Liquidity subtab in the Fixed Income Worksheet function. FIW lets you see all of the bond pricing sent to you via deal runs (RUNZ) so you can analyze available liquidity.

Here's an example of how you can use FIW to trim a large list of bonds down to a manageable set of securities that meet your needs and then analyze their liquidity.

1. Let's start with the Bloomberg Barclays US Corporate Bond Index, for example. To load it in FIW, run **{FIW <GO>}**, click into the amber field in the upper left corner of the screen, and select LUACTRUU Index if it's among your saved items. If not, click on Browse... at the bottom. In the Browse window that appears, click on Indices under List Sources. Simply enter "LUACTRUU" in the field below Ticker. To add the benchmark to your favorites so you can easily load it again, click on the star icon and then the Close button to load the index's bonds into FIW (**FIG. 1**). (You can also use the Browse option to populate FIW with bonds from your saved RUNZ Workbooks, Fixed Income Lists, Fixed Income Searches, Portfolios, Security Worksheets, Funds, Benchmarks, Portfolio Groups, and IMGR Searches.)

Click on the Bond List tab, and you can see aggregate metrics for the bonds you've loaded in FIW. In this case, the benchmark included almost 6,100 investment-grade, fixed-rate bonds as of mid-November. Their average coupon was 4.078%, average maturity was 11 years, and average price was $108. Average spread to benchmark was +103 basis points. G-spread, the spread to the matched point on the government curve, was +109 basis points on average.

Fig. 1 Run **{FIW <GO>}** to open the Fixed Income Worksheet function.



2. Now that you have an overview of the universe you're working with, you can use the filtering fields in the Facets panel to drill down to the securities that meet your investment needs. Let's say you want to adjust the profile of your portfolio by adding securities from U.S. issuers that Moody's Investors Service rates Baa1 or Baa2—the two steps above the lowest rung of investment grade.

To do that, first tick the box next to United States under Country/Region. That trimmed the list a little, though you're still looking at about 5,300 bonds. To add the ratings criteria, scroll down to the ratings section in the Facets panel. Use the drop-down to select Moody's Rating. Then click on Baa1 and Baa2.

Let's focus on bonds that have a somewhat shorter maturity than the index as a whole: between 3 years and 10 years. Under Maturity, tick the boxes for 3 to 5 yrs, 5 to 7 yrs, and 7 to 10 yrs. Next, let's add a criterion that focuses on issues with more than $500 million outstanding. Scroll down to the Amount/Issue section and tick the boxes next to 500MM to 1MMM and >1MMM.

Finally, let's also focus on four sectors. Under BCLASS Level 3, click on More.... Tick the boxes for Capital Goods, Consumer Cyclical, Energy, and Communications. Click the Update button. Now the list is a more manageable 150 securities. You can use the amber fields in the main panel to drill down even further (**FIG. 2**).

Fig. 2 We've used the filters in the Facets panel to winnow the list. Next, let's add two more criteria to focus on bonds that trade cheap and still offer decent yields.

3. For a new liquidity template, click on Worksheet, select Switch worksheets, and tick the box next to Liquidity USD. Buy-side traders and portfolio managers who receive a plethora of traders' runs can now analyze the current market liquidity of these securities by clicking the Liquidity subtab on the Bond List tab. FIW integrates Bloomberg's Inventory Manager functionality, **{IMGR <GO>}**, including information received from runs, so you can assess the bond liquidity in the form of bid and ask axe depth that's available to you. ●

Fig. 3 Click on the Liquidity subtab under the Bond List tab to display pricing sent to you via deal runs (RUNZ).

Gee is a fixed-income market specialist and Jagernauth is a fixed-income analytics advanced specialist at Bloomberg in New York.

Investment Banking

The Risk to One of Wall Street's Richest Businesses

By SONALI BASAK

THEY FLEW IN FROM across the U.S.—venture capitalists and entrepreneurs—to discuss a new way to sell stock to the public and keep more money for themselves. The venue, appropriately, was a landmark hotel nicknamed "The Bonanza Inn."

Not invited: the bankers who've long dominated initial public offerings.

For much of that September day at San Francisco's Palace Hotel, investors behind many of Silicon Valley's biggest unicorns took turns railing against Wall Street. Some fumed over the hefty fees bankers collect for ushering companies onto the stock market. Many criticized IPOs for being priced too low—shortchanging the company owners—so banks could deliver quick profits for big money managers.

Such complaints have been around for decades, but now there might be a solution. In 2018 a technique called a direct listing proved that technology can glide a company onto a stock market as smoothly as an expensive fleet of Wall Street underwriters.

Two of the dominant U.S. IPO underwriters, Goldman Sachs Group Inc. and Morgan Stanley, are helping to develop the direct listing system in a bet that they can keep a place for themselves in the process. But the San Francisco gathering made it clear that much of Silicon Valley wants to limit the involvement of banks.

Instead, the Valley crowd is giving a bigger role to Citadel Securities, a Chicago-based firm with little stake in the existing IPO underwriting market, for its market-making technology.

BRINGING PRIVATELY HELD, capital-hungry companies to the exchange for a public offering of stock is one of Wall Street's oldest and proudest functions. Bankers advise startups on how much they can raise and when to go to market. Once conditions are ripe, the companies embark on a roadshow to drum up investor interest and price the new stock. On the big day, a syndicate of banks—sometimes numbering in the dozens—buys up blocks of stock to parcel out to money manager clients. The typical 7% fee on the money raised in a U.S. IPO has withstood competition for the deals, though some of the most high-profile debuts get discounts. Last year, global IPO fees surpassed $7 billion, with the top three banks each bringing in more than $500 million, according to data compiled by Freeman & Co.

Companies have tried alternatives. In 2004, Google Inc. (now Alphabet Inc.) famously opted for a so-called Dutch auction, in which investors submit bids and the final price is the highest at which the entire offering can be sold. Low demand forced the company to cut the offering in half and sell at the bottom of the price range it had sought. But the stock popped on the first day, and then the shares kept climbing. There's been debate ever since over whether Google could have gotten more money with a traditional IPO.

A direct listing moves a company's stock onto the public market, allowing venture capitalists and employees to cash out, without raising new capital. It does away with the order-building phase, relying on software to match private shares and public demand on the fly. The risk is that supply and demand fall out of whack, leading to violent price swings or even a trading halt, potentially inflicting major damage. Bankers try to keep that from happening by gauging investor interest.

In 2018, Stockholm-based music-streaming company Spotify Technology SA became the first high-profile startup to go public through the technique. Its stock swooned as much as 11% from the opening price of $165.90 and remains below that level today. The company paid about $35 million to Goldman Sachs, Morgan Stanley, and Allen & Co. By contrast, if Spotify had raised $2.4 billion in a traditional IPO—selling about 10% of the company—it would have paid $75 million even at a discounted 3% fee. For its part of the process, Citadel Securities was paid by the stock exchange.

Slack Technologies Inc. followed in 2019. On an overcast morning

Fig. 1 To track trading in Slack just after it listed, type **{WORK US <Equity> IGPC <GO>}** and use the edit menu to change the date range to June 20 to June 21.

in June, as a jazz band played in front of the New York Stock Exchange's massive columns, startups across the country watched to see if the technology would succeed in matching a supply of closely held shares with a flood of investor bids in real time. Everything hummed.

The opening stock price valued Slack at more than double its latest private funding round valuation. (It has since fallen, on a depressed outlook for company revenue.) Trading volume at the open was the third-highest for any debut in the U.S., the New York Stock Exchange said. Slack, which paid advisers $22 million, probably reduced its costs by about a third compared with a typical IPO, according to bankers involved in the deal, who said they immediately started talking to other companies interested in direct listings.

When venture capitalist John O'Farrell lingered on the trading floor, it wasn't to see the bankers. Instead, he waited next to a booth occupied by Citadel Securities, the market-maker majority owned by billionaire hedge fund investor Ken Griffin, to introduce himself to a pair of low-key executives steeped in the deal's wiring. It was their computers that had handled the deluge—and $1 billion of their firm's own money facilitated 1 out of every 5 trades. Citadel Securities wouldn't say if it earned profits on those trades.

O'Farrell was clearly impressed. His firm, Andreessen Horowitz, an early investor in Facebook Inc. and Twitter Inc., among others, wields immense clout in deciding how Silicon Valley stock offerings are carried out. If an era of direct listings is commencing, the starting point may be that afternoon he spent with Joseph Mecane, Citadel Securities' head of execution services, and Peter Giacchi, head of floor trading, on the floor of the NYSE.

"Everything we design in the first couple of days is about smooth performance," Mecane would say later at a Citadel Securities office near the stock exchange. "We feel like we have our brand and reputation on the line with this business."

Mecane, the former head of electronic equities trading at Barclays Plc, jumped to Citadel Securities in 2017 and has been busy building a team to ensure smooth trading in the more than 1,400 listed entities for which the firm serves as designated market maker. Citadel Securities aims to expand that client set by helping more companies go public. In that sense, the listing business is just an entry point for potential future revenue. Citadel Securities says its goal is to work with banks on listings and not to compete with them.

Mecane's counterpart on the trading floor is Giacchi, who's been making markets for more than 20 years, watching machines replace the functions of hundreds of people. Direct listings put the emphasis on traders and their role in price discovery, a development Giacchi welcomes.

"It's given the floor a renewed sense of value," he says. Now, helped by technology, there is "the ability to process information quickly and reinvent yourself on the floor."

Just a few months after O'Farrell's trip to the trading floor, his firm would help lead the charge in San Francisco to tell the other attendees about the promise of direct listings.

In June, famed venture capitalist Bill Gurley at Benchmark Capital encouraged his more than 400,000 Twitter followers to call Citadel Securities and Morgan Stanley and pursue their own direct listings. "Other banks want to position direct listings as 'exceptional' or 'rare,'" Gurley wrote.

Five more companies may pursue direct listings in 2020, according to Morgan Stanley.

Still, it may yet take years for IPOs to give way entirely to direct listings, says M.G. Siegler, a partner at Google Ventures, another major backer of startups. But "I'm not writing it off that it could be the majority of listings moving forward." ●

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Fundamental Review of the Trading Book: How Hedging Explains Variations in Capital Impact

By EUGENE STERN

WHAT EFFECT WILL the Fundamental Review of the Trading Book have on banks' minimum capital requirements for market risk? It depends on how you look at it.

A quick refresher: The Basel Committee on Banking Supervision has developed a new regulatory framework to measure the risks to banks' trading books. Its aim is to ensure that financial institutions are better capitalized against the kind of losses some suffered during the global financial crisis. Known as the Fundamental Review of the Trading Book, the new Basel III regime is slated to take effect on Jan. 1, 2022, replacing the stopgap Basel 2.5 framework introduced in July 2009.

The committee has emphasized that in aggregate its new framework shouldn't increase bank capital compared with Basel 2.5. While this overall goal is still a work in progress, it's even more striking how much capital requirements might change for individual banks.

In October the committee released its latest *Basel III Monitoring Report*, which is based on information reported by banks to the committee's Quantitative Impact Study Working Group. In one section the report summarized market risk data provided by a sample of 50 so-called Group 1 banks—defined as those with Tier 1 capital of more than €3 billion ($3.3 billion) and active internationally—and 14 Group 2 banks—which are all others. On average, market risk capital would increase 54.7% for this set of Group 1 banks under the FRTB and 18.9% for the Group 2 banks. "There is wide variability at the bank level," the report went on to say. "Outliers are far more extreme."

Fig. 1

Widely Variable Impact

Change in banks' minimum required capital under Basel III as a percentage of requirements under the current Basel 2.5 regime

	Group 1 banks	*Group 2 banks*
Max	372.3%	262.5%
95th percentile	176.0%	241.2%
75th percentile	79.9%	98.9%
Median	30.0%	27.7%
25th percentile	1.7%	7.9%
5th percentile	–56.4%	–58.9%
Min	–77.9%	–77.9%
Weighted average	54.7%	18.9%

Source: Basel Committee on Banking Supervision, *Basel III Monitoring Report*, Oct. 2019

Big Differences

Let's dig into the variability. Consider a table of summary statistics describing the effect of the revised minimum capital requirements for these Group 1 and Group 2 banks (**FIG. 1**). The Group 1 bank at the 5th percentile will have its market risk capital under FRTB drop 56.4% relative to the current Basel 2.5 regime. The bank at the 95th percentile will see a rise in market risk capital of 176%. Outliers are even more extreme, as the committee noted.

What accounts for this variety of results across banks? Broadly, the impact depends on both the bank's trading book and the choices it makes about how to implement the rule.

In FRTB there are two approaches for calculating capital

Fig. 2 You can use MARS Market Risk, Bloomberg's enterprise risk analytics and reporting solution, to perform pretrade FRTB-SA capital analysis.

requirements: the internal models approach (IMA) and the standardized approach (SA). The most basic implementation choice is whether to use IMA—and for which desks the bank should seek IMA approval. When FRTB was first released in 2016, most large banks expected to stay on IMA and started planning accordingly. But as IMA's complexity became apparent, many reconsidered. Some may end up not using IMA at all.

Many banks' submissions to the Quantitative Impact Study were based partly or entirely on SA. So the variability needs to be understood in an SA context. As the standardized approach appears at first glance to be completely prescribed and uniform across banks, what can account for the large differences in capital impact?

Hedging Effects

One important variable is whether—and how—a bank hedges. This is because SA typically generates high capital charges for unhedged positions but allows substantial netting when it recognizes a hedge. Banks need to carefully assess how the hedges on their books will be treated under FRTB-SA and how the capital relief from hedging compares with that under Basel 2.5. Operationally, banks will need to do this analysis on demand for prospective trades so they're not surprised when a trade carries a high charge or turns out not to yield the capital relief banks may have expected.

For example, suppose a client asks a large bank to write a close-to-the-money put option on 70,000 shares of Meridian Bioscience Inc., a maker of medical test kits. Run **{VIVO US Equity GP <GO>}** for a chart of Meridian shares, which traded at $10.06 on Nov. 1. With a market value of $429 million, the stock would be classified as small-cap. Suppose further that the bank would like to delta hedge with an exposure to the underlying but has trouble finding the stock to short in the market. (Delta is the change in an option's price given a change in the underlying stock price. Delta hedging involves combining the option's exposure with a certain quantity of the underlying stock such that a small change in the price of one cancels out a move in the other.)

First, the bank might consider the impact of leaving the position unhedged. In using the sensitivities-based method (SBM) to calculate delta and curvature, the bank would need to apply a risk weight of 50% to a position with roughly 44% delta. You can use Bloomberg's enterprise risk analytics and reporting solution, MARS Market Risk, to perform such a pretrade analysis. MARS Market Risk's FRTB-SA system showed that leaving the trade unhedged would result in a substantial SBM capital charge as of early November (**FIG. 2**). For more information on MARS Market Risk, contact your Bloomberg representative.

So the bank starts to look in earnest for a hedge. It quickly finds an opportunity to sell short a larger-cap stock in the medical supplies sector: Abbott Laboratories. Go to **{ABT US Equity GP <GO>}** to chart shares of Abbott, which traded at $82.66 on Nov. 1. Before executing the trade, the bank runs another pretrade check of the capital impact using the what-if screen in MARS Market Risk. Abbott's market cap is several orders of magnitude above the cutoff of $2 billion, so it falls in equity risk bucket 5 for SBM (large market cap, advanced economy, with a smaller risk weight of 30%). Because the exposure and the hedge fall in different risk buckets, though, the bank may apply a correlation of only 15% to the pair under SBM. If we think of the formula for SBM as a variant of so-called parametric expected shortfall, we are adding a slightly negatively correlated position. Because the correlation is slight, the volatility of each element will have a higher impact on the ►

Fig. 3 Run **{MEMB <GO>}** on a selected equity index to display constituents and weights on the Bloomberg terminal.

SX3P Index | Display | Alert | Export | Member Weightings

STOXX Europe 600 Food & Beverage Price EUR | 23 Members | Currency LCL

Members | Historical Summary

3) Stats | Group by None | 4 Fields | As of 11/13/2019

Ticker		Name	Weight (%)*	Shares	Price
11) NESN	SE	Nestle SA	30.104985	1,579.490870	104.6400
12) DGE	LN	Diageo PLC	15.173826	2,101.322670	3,116.0000
13) ABI	BB	Anheuser-Busch InBev SA/NV	12.069487	841.541352	72.2700
14) BN	FP	Danone SA	9.621797	644.909184	75.1800
15) RI	FP	Pernod Ricard SA	6.858415	203.711072	169.6500
16) HEIA	NA	Heineken NV	4.364274	238.004280	92.4000
17) KYG	ID	Kerry Group PLC	3.516183	153.270401	115.6000
18) CARLB	DC	Carlsberg A/S	2.693085	105.652480	959.8000
19) ABF	LN	Associated British Foods PLC	2.066417	360.132586	2,476.0000
20) MOWI	NO	Mowi ASA	1.954355	438.561916	227.0000
21) HEIO	NA	Heineken Holding NV	1.719646	100.176892	86.5000
22) LISN	SE	Chocoladefabriken Lindt & Spruen..	1.629704	0.108450	82,500.0000
23) ORK	NO	Orkla ASA	1.385058	807.253505	87.4000
24) CCH	LN	Coca-Cola HBC AG	1.184256	204.164235	2,503.0000
25) BARN	SE	Barry Callebaut AG	0.842393	2.332216	1,983.0000
26) TATE	LN	Tate & Lyle PLC	0.786258	468.362141	724.4000
27) CPR	IM	Davide Campari-Milano SpA	0.775675	476.952960	8.1950
28) RBREW	DC	Royal Unibrew A/S	0.644042	42.574980	569.6000
29) AAK	SS	AAK AB	0.586661	174.947479	180.9500
30) BVIC	LN	Britvic PLC	0.583166	265.447652	948.0000

5) Analyze List | *Index Weight (%) Calculated by Bloomberg

calculated risk of the pair than any offsetting correlation effect. In our pretrade analysis, we find that the short equity position actually does not reduce the total delta charge of the combined equity book, which is labeled Developed Markets in our example.

Of course, if the bank did manage to short the actual underlying, it would get more favorable capital treatment, as the risk factor driving the delta of both the option and the hedge would be the same, and the exposures would net. (Note, however, that even in this case the vega and curvature charges associated with the option would not be offset. Vega is the sensitivity of an option's price to a change in volatility.)

Index Treatment

The treatment of hedges also makes a substantial difference when a bank has exposures to indexes and funds. Say the bank writes an option on an equity or credit index and uses a subset of the index constituents to hedge. To capture that situation properly, the bank needs to represent the option exposure in terms of the index constituents so they can be offset against the hedge (**FIG. 3**). This is commonly referred to as a look-through approach.

The final FRTB rule offers banks a partial choice under SA of whether to use look-through. To understand this, recall that under SA, index exposures will typically incur two capital charges: one under the SBM and another—typically smaller—under the default risk charge (DRC). The original 2016 formulation of the rule required banks to take a look-through approach to index exposures both for the SBM and for the DRC. This was relaxed somewhat in the final 2019 version of the rule, giving banks the option not to look through to constituents for SBM only (though look-through is still required for the SA-DRC). Correspondingly, the final rule introduced new risk buckets representing index exposures—equity is broken up into developed and emerging-markets buckets and credit into investment grade and high yield—to give banks a way of mapping index exposures if they choose not to look through.

It may appear simpler to avoid look-through modeling for SBM, but it can lead to higher capital charges because exposures to an issuer in the index and in the hedging portfolio cannot net properly without using look-through. The correlations between exposures to equity index buckets and exposures to individual equity names, for example, are set at 45%. The effect here is less extreme than in our previous example, but 45% is still not a high correlation. It drops even further in the "low-correlation scenario" that banks must consider as part of the SA calculation, leading to an even higher capital charge. This example underscores the importance of having access to constituent data on both equity and credit indexes and funds so you can look through.

Looking Ahead

Taking effect in 2022, FRTB is pushing banks to upgrade their market risk data, analytics, systems, and processes. The variability in the October Quantitative Impact Study results—and the even more extreme differences in the March 2019 report—may prove temporary, but there remains substantial work in the future for many banks. As the deadline draws nearer, many are looking to enhance their risk platforms, not only to bring predictability to capital requirements, but also to improve the accuracy and robustness of how they manage market risk. FRTB certainly poses challenges, but it also brings opportunities. ●

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Abu Dhabi's Moneyman

By NICOLAS PARASIE, MAHMOUD HABBOUSH, and MATTHEW MARTIN

PHOTOGRAPH BY MOHAMED SOMJI

FOR AN EMIRATI WHO'S not a member of Abu Dhabi's ruling royal family, Khaldoon Al Mubarak is remarkably influential. Photos of him with Barack Obama and Donald Trump decorate his desk. Around the time of our interview with him in October, he'd hosted Russian President Vladimir Putin and caught up with former U.S. Secretary of State John Kerry and retired U.S. Army General David Petraeus.

From a tragic childhood—his father was assassinated when he was 8 years old—Al Mubarak, who turns 44 in January, has risen to become one of the ruling Al Nahyan family's most trusted advisers. He's also chief executive officer of Mubadala Investment Co., a $229 billion state-owned holding company. His broad remit—it even includes the chairmanship of Manchester City Football Club—is particularly important now as Abu Dhabi seeks to reduce its dependence on oil and Mubadala works to diversify its investments.

Al Mubarak, wearing a traditional white ankle-length *kandura*, says his challenge is to navigate the transition. "A divorce from oil and gas is not going to happen," he says. "This is always going to be a core part of our economy. How do you get the best out of that with a view to the future, while at the same time building the rest? My focus is on building the rest."

Power in Abu Dhabi, the wealthiest of seven sheikdoms that make up the United Arab Emirates, flows from Sheikh Mohammed bin Zayed Al Nahyan, the U.A.E.'s de facto ruler and chairman of Mubadala. Al Mubarak, says Christopher Davidson, associate fellow of the Royal United Services Institute in London, "represents the new generation of savvy urbane technocrats the crown prince has sought to surround himself with."

Abu Dhabi, with a population of about 2.9 million, is home to roughly 6% of the world's oil reserves. As it adjusts to a less petrocentric future, the emirate's financial industry has begun a wave of consolidation that's seen the megamerger of two of its largest banks and three of its four investment funds. Al Mubarak has been central to these efforts as chairman of the Abu Dhabi Executive Affairs Authority, which advises the crown prince, known colloquially as MBZ, on strategic issues.

Mubadala is part of the evolution. The fund, started as a means of diversifying the economy by attracting expertise and jobs to the emirate, is now a global powerhouse. This year alone, it's invested in Greek fish farming, Europe's biggest electric-scooter-sharing company, and a Canadian data center. Al Mubarak has sought to put a new gloss on the emirate's sometimes tangled financial affairs. Mubadala was formed in 2017 by the merger of its predecessor, Mubadala Development Co., and International Petroleum Investment Co. That year, Al Mubarak, who'd been CEO of the predecessor company since 2002, took over the new holding company.

In doing so, he inherited IPIC's troubles. IPIC had gotten caught up in a series of investigations over whether and how money flowed from the Malaysian government's scandal-ridden 1MDB development company through fraudulent shell companies to corrupt officials. Today, across the way from Mubadala's fairly modest headquarters, IPIC's flashy office tower looms as a reminder of petrodollar-fueled excesses before prices nose-dived in 2014.

Mubadala Investment reported total comprehensive income of 12.5 billion dirhams ($3.4 billion) for 2018, a 21% increase from the previous year. Under Al Mubarak, the fund has been selling some of its more mature assets and exploring new sectors. Technology is a "priority area where I personally spend a lot of time," he says.

In 2017, Mubadala committed $15 billion to SoftBank Group Corp.'s $100 billion Vision Fund. Al Mubarak says he's monitoring the fund's performance before deciding whether to sign up for the second round. "Tech is inherently risky," he says. In November the Vision Fund reported a loss of about $9 billion on its stake in We Co. and other tech companies.

In an emirate as rigidly hierarchical as Abu Dhabi, Al Mubarak's ascent was far from preordained. His father, a U.A.E. diplomat, was living in Paris as ambassador to France when he was killed by

Palestinian militants in 1984. Al Mubarak was raised by his grandfather, the U.A.E.'s first chief justice, and became close to the royal family.

After graduating from Tufts University in Massachusetts in 1997, he started out as a sales executive for Abu Dhabi National Oil Co. and eventually landed at Mubadala Development as its first CEO. There, and later at Mubadala Investment, he's overseen a series of high-profile investments in companies such as EMI Music Publishing, General Electric, and Carlyle Group.

Al Mubarak has had his share of narrow escapes. In 2012, Mubadala Development invested $2 billion in the business empire run by the Brazilian serial entrepreneur Eike Batista, who at the time was one of the world's richest people. When Batista's edifice collapsed later that year, Mubadala was one of the few investors to come out relatively unscathed. (The fund sold its stake in the company that owns Burger King, a holding acquired through the Batista deal, for a substantial profit this summer.) "That was a challenge," Al Mubarak says. "If it wasn't for the well-structured deal that we did, the outcome would have been very difficult—substantially negative."

As the photos and assorted memorabilia in his offices suggest, Al Mubarak's interests extend well beyond the financial world. There's a framed, sky-blue soccer jersey: a nod to Man City, which, thanks to massive cash infusions from Abu Dhabi, has become one of the world's most successful soccer teams. There's a scale model of a Ferrari: Mubadala once had a stake in the automaker, and Al Mubarak negotiated the deal that brought the Grand Prix Formula One race to Abu Dhabi. And there's a touch of humor: a Darth Vader bust in a traditional Arab headdress.

These items—along with two imposing paintings, one French, one Korean—point to a man with deep connections inside and outside the Gulf. Last year, Al Mubarak became a special envoy to China, a new post signaling growing ties between Beijing and the Gulf in oil and gas, banking, and logistics.

All of this reinforces his day job at Mubadala, Al Mubarak says: "I'm hearing from U.S. private equity. I'm hearing from European public companies. I'm dealing with Chinese companies. I'm listening to Russian companies. This gives me a perspective that's very helpful to me as I run the organization."

In the end, the most telling photo of all is probably the one of Al Mubarak with MBZ, given that the source of Al Mubarak's power is closer to home. "I've been lucky to work with very incredible people throughout my professional career, incredible leaders," he says. "This starts with His Highness." ●

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Martin is a reporter for Bloomberg News covering energy and finance.

The Year in Risk

A Rising Tide of Protests

Economies on the verge of collapse, a yearning for greater democracy, revulsion against corruption and inequality—the grievances that drove people into the streets in 2019 were consistent across continents. Some marched peacefully, others clashed violently with security forces, and in at least five places the unrest helped topple government leaders.
—*Alan Crawford*

Worldwide

A defining movement of 2019 was the worldwide push for more urgent government action against what scientists and activists call a climate emergency. Demonstrations took place around the globe, many inspired by the 2018 school strikes started by Swedish teenager Greta Thunberg.

Selected territories that saw organized demonstrations in 2019

Result of protest

- ☐ Leader ousted
- ■ (red) Policy changed
- ■ (yellow) Other

Main reasons

- ● Legal, human, or territorial rights disputes
- ■ Price increase or tax
- ▲ Corruption
- ◆ Economic hardship

Risk took on some surprising shapes in 2019. People stood up to governments. Negative yields rattled the bond market. Passive funds overtook the stockpickers. Leverage peaked, unicorns deflated, and illiquidity destroyed fund managers. In the following pages we hope to offer some insights to help prepare you for the perils of 2020.

Slovakia
Slovaks took to the streets in October to demand investigations into crimes and the rooting out of government corruption.

Czech Republic
Prime Minister Andrej Babis, one of the country's richest men, was a target of the biggest protests since 1989.

Russia
Moscow has been the center of the largest antigovernment rallies in seven years.

Iraq
Scores of people have died in demonstrations decrying unemployment, a lack of services, and government corruption.

Iran
Fuel-price hikes resulting from U.S. sanctions sparked protests that led to more than 100 deaths, Amnesty International said.

South Korea
Tens of thousands protested the appointment of Cho Kuk as minister of justice. He left after five weeks on the job.

Lebanon
A levy on WhatsApp calls sparked pent-up anger, forcing Prime Minister Saad Hariri to resign in October.

Hong Kong
A June rally against a proposed law allowing extradition to China morphed into a broad anti-China movement.

Algeria
Algeria's president, Abdelaziz Bouteflika, sought a fifth term, prompting unrest. He resigned in April.

Sudan
Omar al-Bashir crushed dissent during his 30-year presidency, but discontent over prices led to unrest that forced him out in April.

Malawi
Allegations of election rigging prompted tens of thousands to take to the streets of Malawi's cities in August.

Indonesia
October protests raged against the government's program, including controversial changes to the criminal code.

Papua
In Indonesia's easternmost region, clashes between separatists and government forces in August and September resulted in many deaths.

South Africa
Poor government services and a lack of housing were the primary reasons for violent demonstrations that broke out in April.

Source: Bloomberg reporting

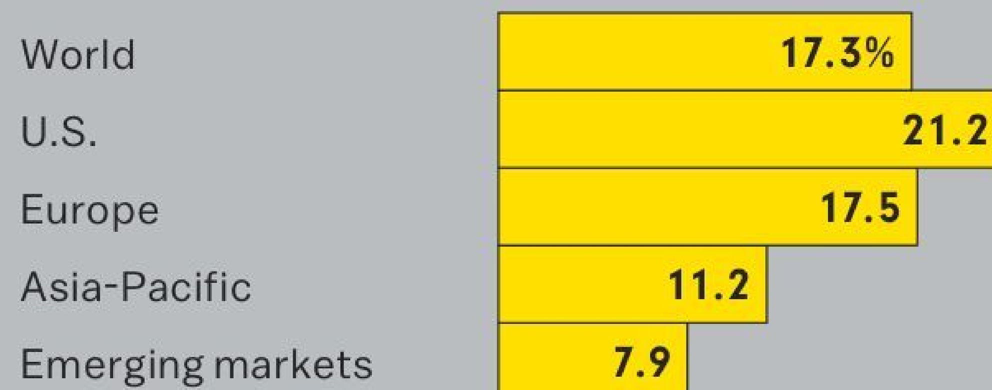
Major Assets Climb

■ A global rally lifted almost every boat. Long strategies made money through most of the year. Stocks, bonds, and commodities had positive returns. Only in the zero-sum game of spot currencies did major assets post losses.
—*Eddie van der Walt*

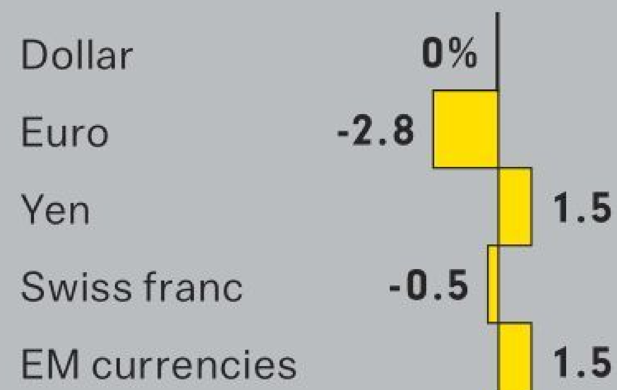
Risk On

Change from Dec. 31, 2018, to Oct. 31, 2019

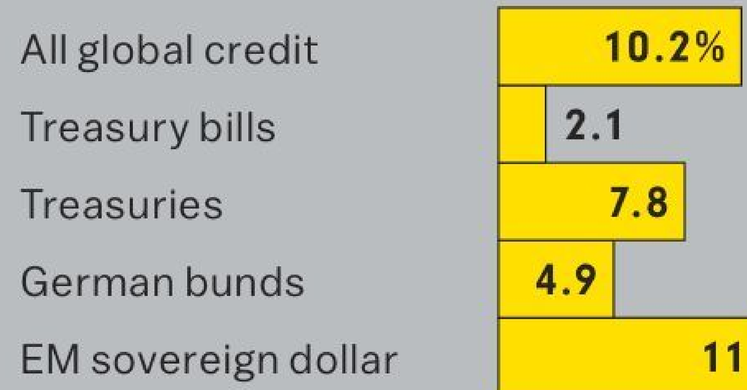
Stocks



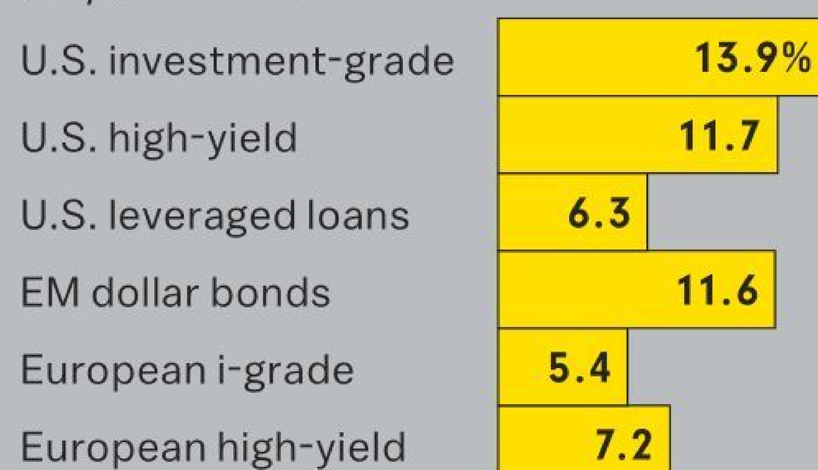
Currencies



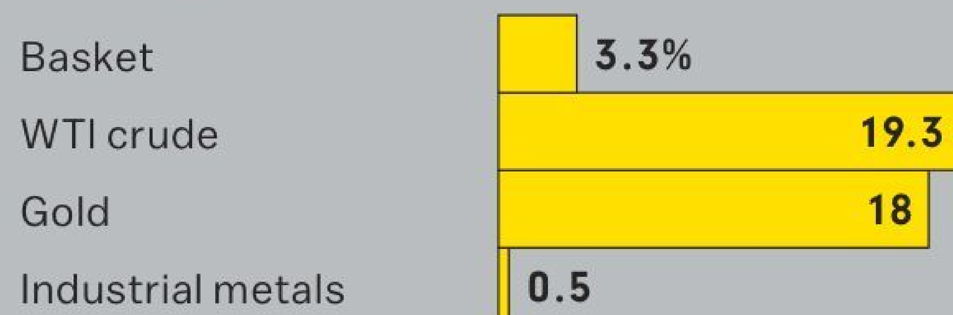
Bonds



Corporate debt



Commodities



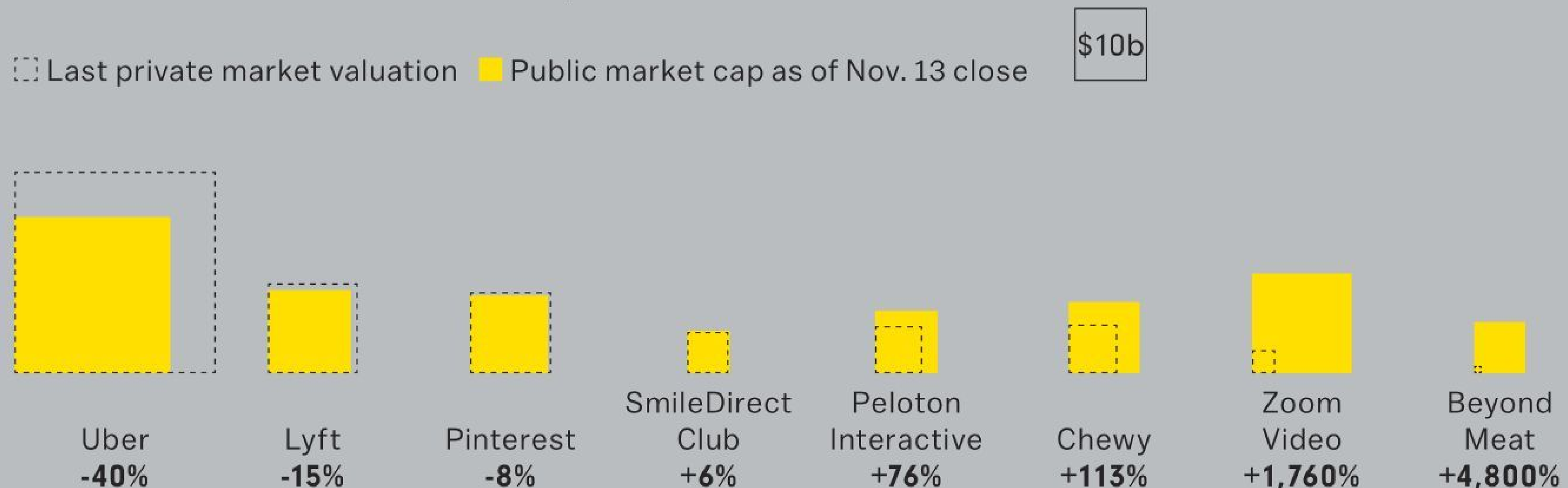
Sources: {MXWD Index}, {SPX Index}, {SXXP Index}, {MXAP Index}, {MXEF Index}, {BBDXY Index}, {EURUSD Curncy}, {JPYUSD Curncy}, {CHFUSD Curncy}, {MXEFOCXO Index}, {LGDRTRUU Index}, {LD20TRUU Index}, {LUATTRUU Index}, {BCEG1T Index}, {BSSUTRUU Index}, {I17660US Index}, {LF98TRUU Index}, {SPBDAL Index}, {BSEKTRUU Index}, {LP05TRUU Index}, {LP01TRUU Index}, {BCOM Index}, {CL1 Comdty}, {XAUUSD Curncy}, {LMEX Index}

Unicorn IPOs Sizzle—or Fizzle

■ The march of the unicorns onto Wall Street met with mixed results. Ride-sharing giants Uber Technologies Inc. and Lyft Inc. have seen their market caps shrink since their last-known private-market valuations. But public investors warmly received plant-based protein company Beyond Meat Inc. and others. One big startup never made the trip: We Co., the parent of office-sharing company WeWork, was once valued at $47 billion. In September it canceled a planned initial public offering amid heavy scrutiny of its losses and corporate governance. —*Michael Regan*

IPO Winners and Losers

Value of selected unicorns that went public in 2019



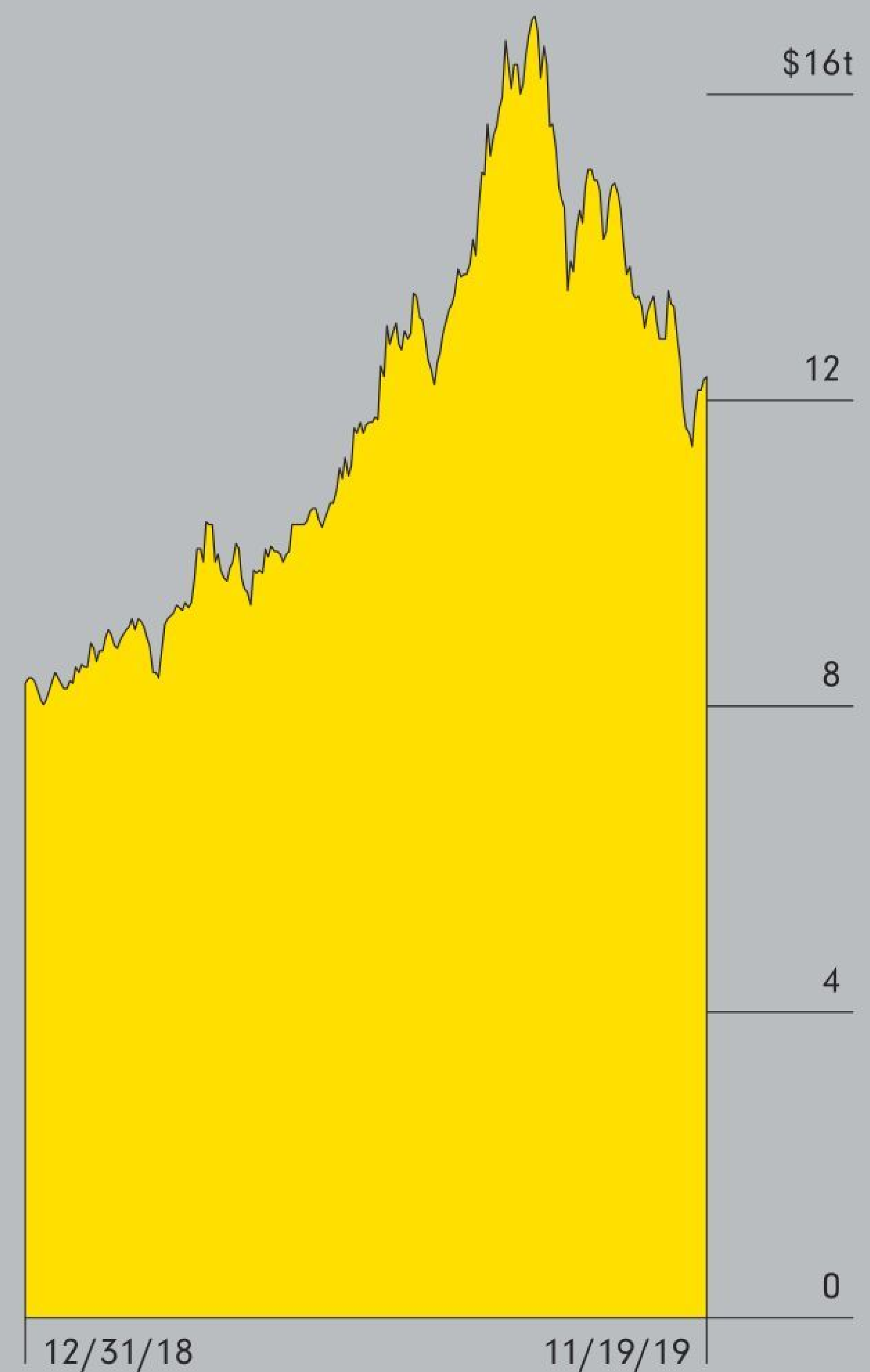
Sources: {UBER US Equity}, {LYFT US Equity}, {PINS US Equity}, {SDC US Equity}, {PTON US Equity}, {CHWY US Equity}, {ZM US Equity}, {BYND US Equity}, Bloomberg reporting

Negative-Yielding Debt Piles Up

■ Concern over the possibility of a U.S. recession mounted in 2019, culminating in a brief but anxiety-inducing inversion of the yield curve. As the yield on the 10-year Treasury dipped below that of the two-year, something else happened, too: The value of negative-yielding bonds—which effectively cost a buyer money to hold—surged. By the end of August, investors held more than $17 trillion in such bonds, according to the Bloomberg Barclays Global Aggregate Bond Index, indicating that investors will pay to store their wealth in a way they consider safe. Most of the increase came from European Union and Japanese government bonds. (Japan's central bank has maintained a negative benchmark rate since 2016.) As fears over a slowdown abated, so did some of the negative-yielding debt. By mid-November, it was a little more than $12 trillion—still well above where it started the year. —*Mark Glassman*

So Much for Income?

Market value of negative-yielding bonds in the Bloomberg Barclays Global Aggregate Index



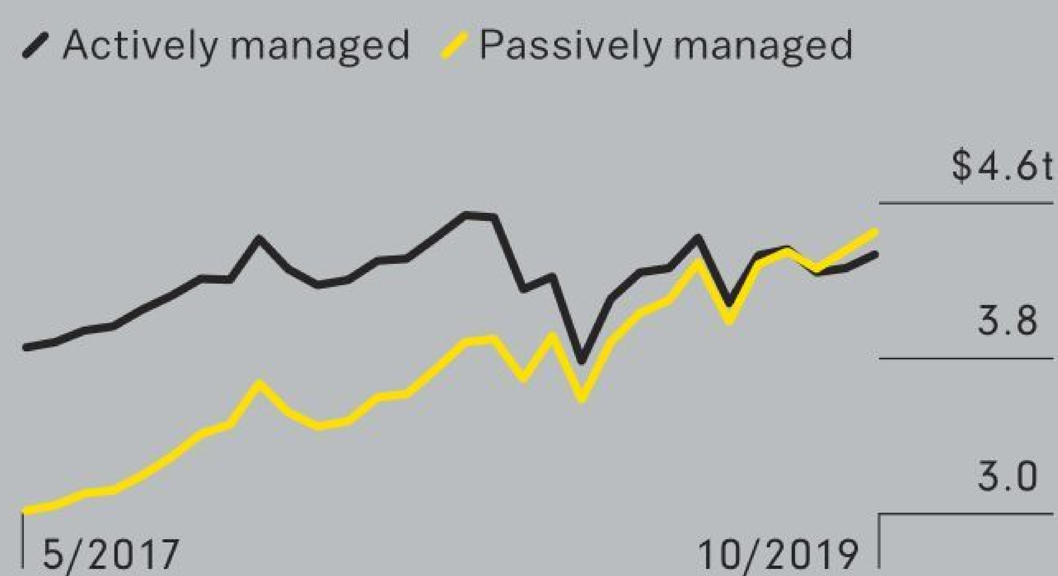
Source: {I32542 Index}

Passive Funds Overtake Active Managers in the U.S.

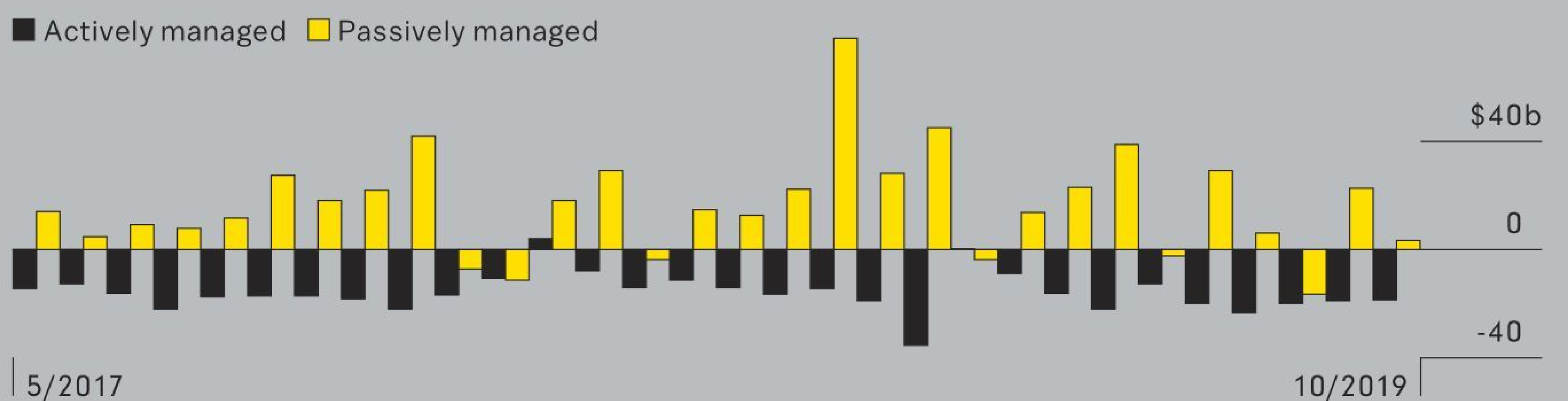
■ The balance of power in investing shifted in August when investors held more money in low-fee passive U.S. equity funds than in funds managed by old-fashioned stockpickers. There's still more than $4.3 trillion in actively managed U.S. equity mutual funds, but the trend seems irreversible amid growing cost consciousness. Average fees per $100 of passive equity funds fell to 10¢ last year, compared with 70¢ for active funds, according to Morningstar Inc. The new order has been decades in the making, dating to the 1970s when Vanguard Group started the fee race to the bottom. In 2018, Fidelity Investments offered the first zero-fee mutual fund. The record bull market has cast further doubt on whether active managers can consistently beat indexes net of expenses. —*John Gittelsohn*

The Algorithms Have It From Here

Net assets in U.S. open-ended equity funds and exchange-traded funds*



Net flows



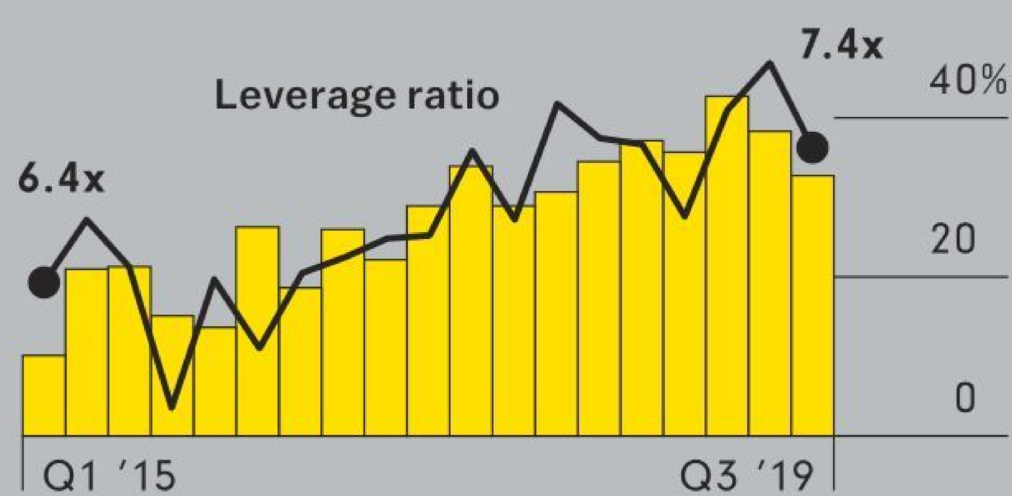
*Excludes money-market funds, funds of funds, and obsolete funds

Source: Morningstar

Leverage Built on Hope

Borrowing on Optimism

Accounting adjustments as a share of reported Ebitda in leveraged loans that finance M&A



Source: Covenant Review

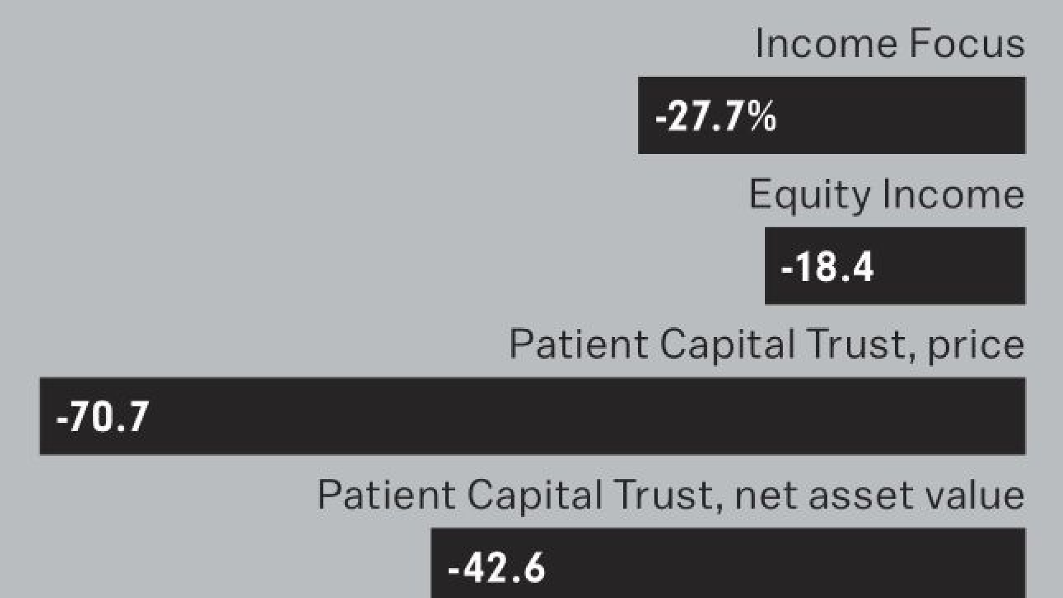
■ Private equity firms piled more debt onto the balance sheets of the companies they bought in 2019 as borrowing stayed cheap. But behind that rising leverage was another worrying sign: A growing share of underlying profit estimates relied on optimistic accounting adjustments that project earnings that may not materialize. So the debt will become even more burdensome if earnings fall short. —*Sally Bakewell and Shannon Harrington*

Bad Bets Bring Down Celebrated Investors

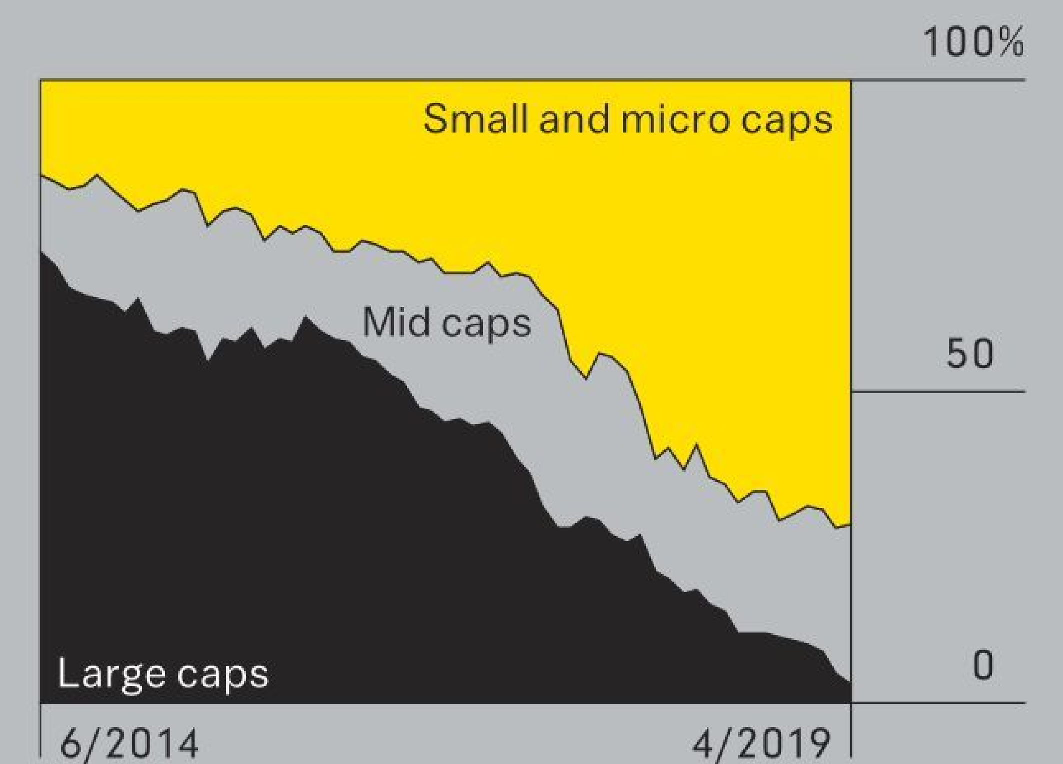
■ The collapse of the empire led by the U.K.'s best-known stockpicker, Neil Woodford, rocked the asset management industry and raised questions about the safety of funds offering a daily entry or exit. In 2017 he began loading up on less liquid small caps to improve performance. In 2019 he failed to sell securities fast enough to meet redemptions. In June, his flagship fund blocked clients from pulling money, an unprecedented move by a retail equity investment firm, drawing scrutiny from regulators. Woodford was ousted in October and shut his company. His fall highlighted the risks of fund managers moving into hard-to-sell assets. In 2018, GAM Holding AG suspended bond manager Tim Haywood after a probe into his illiquid holdings, triggering outflows and forcing GAM to block withdrawals and liquidate funds. H2O Asset Management LLP was hit by huge redemptions by clients concerned about investments in unrated bonds. —*Nishant Kumar*

Fall of a Giant

Decline in value of funds that Woodford managed since inception*



Allocation of the Woodford Equity Income Fund



*Through Nov. 13, 2019

Sources: Bloomberg, Morningstar

Guo Shuqing has the toughest job in global finance: Taming China's gargantuan banking system

By
BLOOMBERG
MARKETS
ILLUSTRATION BY
MARTA ZAFRA

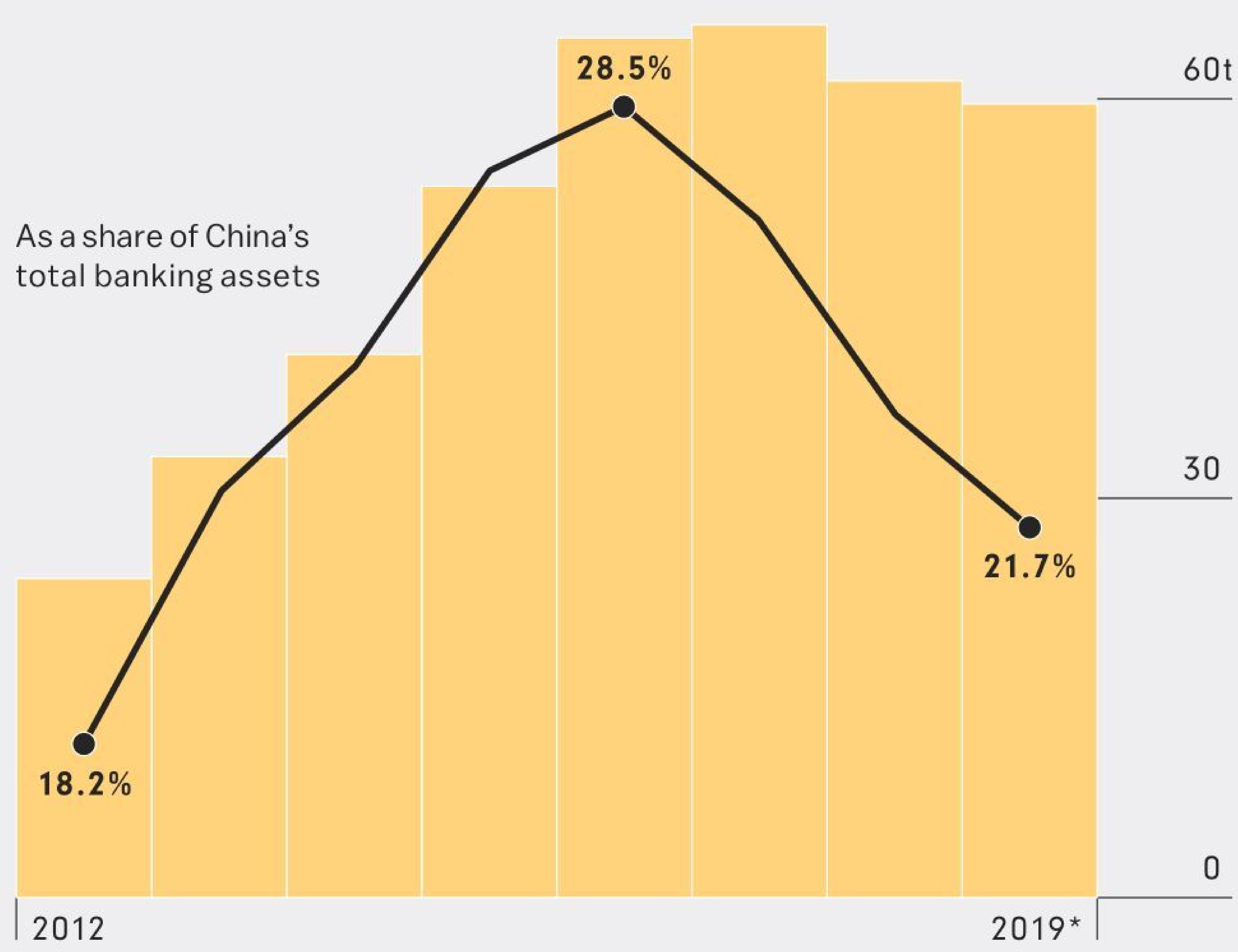
WALKING A $40 TRILLION TIGHTROPE

Two months into his tenure as China's top banking regulator, Guo Shuqing did something his staffers had never witnessed from a senior Communist Party leader. Speaking in Beijing to officials and industry executives from across the country, he pledged to resign if he failed to snuff out the excesses that had been accumulating in China's $40 trillion banking system for almost a decade. ¶ "This is a leader's responsibility," Guo said, according to people familiar with the April 2017 speech who asked not to be named discussing an internal matter. ¶ His comments jolted the audience. Not only is it extremely rare for a high-ranking Chinese official to admit the possibility of defeat, but those listening also understood the enormity of Guo's task. As steward of the world's largest banking system—it's twice the size of the U.S.'s—the 63-year-old arguably has the hardest job in global finance. And it's getting more difficult by the day. China faces its most uncertain economic environment since the global recession a decade ago, a state of affairs further complicated by the civil unrest in Hong Kong. ¶ Guo's priorities—keeping China's financial system stable and chipping away at the implicit state guarantees that underpin everything, including asset-management products and bank deposits— ►

are maddeningly contradictory. To create a more sustainable system where financial risk and return go hand in hand, he must convince investors, lenders, and local governments that Beijing won't come to the rescue when asset prices fall or borrowers default. But removing the government backstop could trigger a "rapid and chaotic" repricing of risk that results in exactly the kind of crisis Guo is trying to prevent, says Michael Pettis, a finance professor at Peking University and former banker at Bear Stearns Cos.

Walking that tightrope would be difficult in the best of times, but Guo is doing it with a trade war and a record-high debt burden hanging over China's $13 trillion economy. What's more, he may need to get it done by sometime in 2021; officials at his level typically retire at 65, though there have been exceptions.

To the dismay of China bears everywhere, Guo seems to be pulling off the balancing act. Since becoming chairman of the China Banking Regulatory Commission in early 2017, he's published sweeping rules that ban implicit guarantees on $14 trillion of



asset-management products, shuttered thousands of struggling peer-to-peer lenders, allowed local companies to default on their debt at a record pace, and imposed losses on a troubled bank's creditors for the first time since at least 1998.

Although his unprecedented campaign to rein in moral hazard has caused bouts of financial turbulence and contributed to the Chinese economy's deepest slowdown in decades, the country has yet to experience anything approaching a crisis. China's gross domestic product rose 6% in the third quarter, slightly below estimates but still within the government's target range. Of course, if growth takes a dramatic turn for the worse, Guo will have much less room to maneuver. But for now, the outlook for further reforms looks positive. Investors, policymakers, and academics who've worked with Guo say his financial overhaul is far from over.

"There is still a long way to go," says David Loevinger, a managing director of emerging markets at TCW Group Inc. and former senior coordinator for China affairs at the U.S. Department of the Treasury. Loevinger, during his stint at the Treasury from 2006 to 2012, met with Guo, a fluent English speaker, several times. He describes Guo as "very disciplined and thoughtful," with a "deep understanding of China's financial challenges." At the same time, Loevinger says, Guo recognized "that you couldn't always take a cookie-cutter approach and drop Western regulatory systems into China's financial system."

GUO WAS BORN IN China's remote Inner Mongolia autonomous region in 1956, only a few years before Mao Zedong embarked on the Great Leap Forward, the disastrous industrialization push that led to one of the greatest famines in history. He spent his formative years sowing crops as part of a government program that sent millions of young Chinese to rural areas in the 1970s. After the chaos of Mao's reign subsided, Guo studied philosophy at Nankai University in Tianjin and received a master's degree in Marxist and Leninist theory at the Chinese Academy of Social Sciences.

Guo, who declined to be interviewed for this story, knew he wanted to be a reformer from an early age. In 1984 he published one of his earliest articles, a 35,000-word opus titled "Investigations on Reforming the Chinese Economy," and sent it, unsolicited, to the State Council, China's cabinet, in hopes that top policymakers would learn from its recommendations. He attended the University of Oxford as a visiting scholar two years later, after which he embarked on a tour of Eastern Europe that left him shocked by the bleakness of the region's economies as Soviet communism faltered. He returned to China more convinced than ever about the need for change, including measures to loosen the grip of local governments on the economy, according to a memoir of his travels written in 1987.

Guo landed his first big government job at the State Planning Commission, a predecessor to the National Development and Reform Commission, and climbed steadily through the ranks of Chinese officialdom to become one of its most prominent pro-market reformers. His résumé includes senior positions at the central bank, the securities regulator, China's second-biggest state bank, and the governors' offices of Guizhou and Shandong provinces.

As head of the State Administration of Foreign Exchange, he liberalized cross-border capital flows and made China's currency more flexible. "Not only does he see the right direction, he also matches it with political reality to make reforms truly workable," says Guan Tao, who worked under Guo as head of international payments at SAFE in the early 2000s and is now managing director at the China Society for Finance and Banking.

People who know Guo, including some who didn't want to be named when talking about a senior member of government, describe him as one of the few high-ranking Chinese officials with both a strong scholarly bent and a knack for navigating the country's tricky politics. Guo "was never shy about disagreeing," Loevinger says. "But always in a very thoughtful way."

Married, with a daughter, Guo has written at least 300 essays and 14 or more books. During his rare downtime, he's said to enjoy listening to classical music and discussing topics such as the role of exchange rates in China-U.S. trade relations. Andrew Sheng, an international adviser to the China Banking and Insurance Regulatory Commission, who's known Guo for more than 30 years, summed him up this way: "He can think, he can listen, and he can act."

Guo's political savvy was evident in March 2018 when he won a major vote of confidence from Chinese President Xi Jinping

PREVIOUS SPREAD; PHOTO: GREG BAKER/AFP/GETTY IMAGES

and Vice Premier Liu He, Xi's top economic adviser. They merged the banking and insurance regulators and named Guo as chairman of the combined China Banking and Insurance Regulatory Commission, or CBIRC. He also became party secretary of the central bank, the People's Bank of China. Altogether, this arrangement gave Guo more power than any of his predecessors.

He hasn't been shy about using it. Among his biggest targets has been China's sprawling shadow-banking system, a collection of loosely regulated lenders, fund managers, and other financial institutions that ballooned in recent years thanks in large part to the widespread belief that the government wouldn't let them go bust. The fixed-return, high-yield asset-management products that form the backbone of this financial network have lured trillions of dollars from Chinese savers, most of whom assume that they'll get bailed out if the products face losses.

Guo has steadily chipped away at that assumption by allowing shadow-banking products to fail, particularly in the peer-to-peer lending sector where standards were especially lax. New rules governing wealth-management products—set to take effect at the end of 2020—would shift the industry away from a fixed-return model to something more akin to mutual funds in the U.S., where investors bear the risk of fluctuating market prices and can track their funds' net-asset value every day.

Guo is "trying to diffuse any potential systematic financial risks by letting the market set the appropriate price for risk," says Zhu Ning, a professor at Shanghai Advanced Institute of Finance, who advises the central bank and other economy-related ministries and has written a book on implicit guarantees.

GUO HAS FOCUSED much of his recent attention on tackling problems at the hundreds of small banks that dot China. In May he oversaw a dramatic break with precedent by seizing control of Baoshang Bank Co., a troubled lender from Inner Mongolia, and imposing losses on some of its creditors. The episode triggered a wholesale repricing of credit risk for all but the largest Chinese banks. Proponents of this kind of policing say it will put the financial system on a more sustainable path by forcing markets to differentiate between weak and strong lenders.

Although Guo's enforcement action was widely applauded by China watchers, some economists and traders criticized the opaque way in which it was handled. In the days surrounding the Baoshang Bank seizure, the CBIRC and the central bank didn't communicate clearly what was happening, causing chaos in interbank markets and raising questions about how thoroughly policymakers had planned for the repercussions.

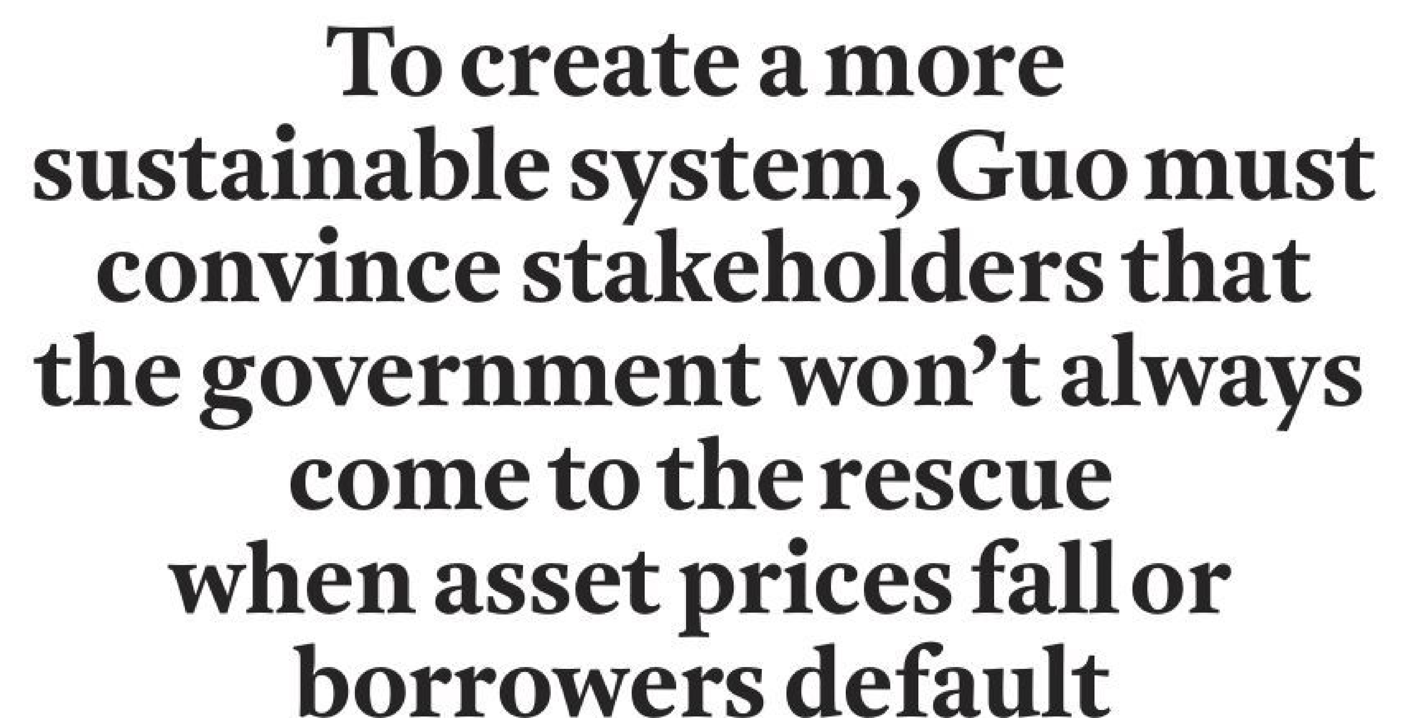
As of mid-November, it was still unclear to what degree Baoshang will serve as a blueprint for China's troubled banks. The issue is likely to flare again: In July, UBS Group AG estimated that the Chinese lenders it monitors faced a capital shortfall of $349 billion.

The government's threshold for financial-market pain may be too low to allow Guo to enact major reforms, says Victor Shih, a professor of political economy at the University of California at San Diego. At Baoshang, for example, even though some creditors suffered losses, 99.98% of them were eventually made whole by the government. Policymakers have subsequently orchestrated full bailouts for several of Baoshang's embattled peers. "He will always come down on the side of ensuring stability," Shih says.

Shih says Guo's balancing act doesn't just limit "big moves on reform"; it also holds back new ways of doing things. "He has tackled an issue that was deemed very important by the leadership," Shih says, "and that was financial risk. Especially in shadow banking. But in the process of doing so, he in effect stifled what was previously a very vibrant and risky part of China's financial system, which is shadow banking and financial innovation."

Investors seeking reform in the way China manages risk are pushing for a number of changes. They include a clear-cut mechanism for allowing weak financial institutions to fail, more aggressive measures to detect and dispose of bad loans on banks' balance sheets, increased incentives for big banks to boost lending to non-state companies, and continued efforts to level the playing field for foreign financial companies.

How Guo handles the rollout of China's new rules on asset-management products will be a major test of his mettle. Some of the biggest Chinese banks are already lobbying regulators to delay implementation as lenders struggle to make existing products compliant and bring off-balance sheet loans onto their books, according to people familiar with the matter. In an unusually pointed speech in September, Xiao Gang, the former head of China's securities regulator who's an adviser to the government, said the 2020 deadline for compliance was "unrealistic and unfeasible."



Guo's success may hinge on his ability to keep financial reform at the top of the Communist Party agenda by cultivating support from Xi on down. One sign of optimism, according to a September report from Beijing-based policy research firm Trivium China: At least 13 officials with strong backgrounds in finance have taken high-ranking provincial government posts in the past three years.

Ultimately, however, the health of China's vast banking system doesn't rest on the shoulders of a single bureaucrat, no matter how skillful or respected or well-connected. "Financial reform is not a one-man issue," says Pettis, the professor at Peking University. "It's a national effort." ●

Mexican President López Obrador promised to revive the state-owned oil giant and make it a company of the people once more.

The San Andrés pipeline, Poza Rica, Mexico

By AMY STILLMAN and JUSTIN VILLAMIL

PHOTOGRAPHS BY JAKE NAUGHTON

Things haven't gone according to plan

‘MAKING PEMEX GREAT AGAIN’

In a small office at the run-down hotel his family owns in Poza Rica, Mexico, Guillermo Salinas recalls how his country's oil dreams imploded, along with many of his own hopes for a brighter future. A light flickers overhead. The air smells of chlorine, though hardly anyone uses the hotel's blue-tiled pool anymore.

On this muggy day in September, some of the few guests at the once-thriving Hotel Salinas are a dozen or so federal police sent to the area to protect pipelines from thieves who siphon off gasoline to sell on the black market. Having *federales* as paying customers is a mixed blessing: The sight of a bunch of guys in the lobby with rifles slung over their shoulders doesn't exactly help lure tourists.

Nowadays any paying customer is welcome here. Poza Rica, a city in the Gulf Coast state of Veracruz, lies on the edge of the vast onshore Chicontepec oil basin. About a decade ago, Petróleos Mexicanos, the state-owned oil giant that has iconic status in Mexico, was investing billions of dollars in Chicontepec. Salinas and other entrepreneurs rushed here to open restaurants, hotels, and oil service businesses.

It looked like Poza Rica was going to be a boomtown. But the boom has become a bust. Joblessness is rampant—even some drug cartels that once terrorized the town have gone elsewhere because there's not enough money to be made.

So, like a lot of Mexicans, Salinas, who manages the hotel day to day, feels let down. "The government told businesses to prepare ourselves by creating new infrastructure and services for Pemex," he says. "That didn't last, and now a lot of investment has stopped. Many of us in the hotel business are fighting to survive."

The same could be said of Pemex. Ratings companies are sounding the alarm over the world's most indebted oil company, with one already cutting its bonds to high-yield, high-risk junk. The biggest risk of all is that the state company's distress will drag down the Mexican economy.

Any hope of preventing that and of revitalizing such places as Poza Rica now rests with President Andrés Manuel López Obrador. When he took office in December 2018, one of his signature promises was to return Pemex to its glory days.

Promises, Promises

Mexico's oil-rich east coast

Source: Ingeniería Investigación y Tecnología

AMLO, as the president is known, has placed Pemex at the heart of his ambitions to upend three decades of neoliberal policies. So while he's pledged much-needed investment to revive the company, he's dialing back moves that had ended Pemex's monopoly on crude production and provided a whiff of modern management practices where do-little jobs-for-life weren't uncommon.

Pemex is now saddled with a mandate that looks a lot like a job creation program, including the construction of a refinery in AMLO's home state that most industry analysts say isn't needed. This populist prescription for saving Pemex, whose debt load is more than $100 billion, is exactly what disturbs ratings companies. The press offices for Pemex and López Obrador didn't respond to requests for comment.

In retrospect it seems clear the president was always headed in this direction. Early in the López Obrador administration, Pemex added the motto "For the Recovery of Sovereignty" to its logo—lest anyone mistake it for a more typical energy producer focused simply on drilling for oil and gas.

And that's where AMLO's troubles began.

WHEN HE BECAME PRESIDENT, López Obrador had at least appeared to have the bona fides for revitalizing Pemex. As mayor of Mexico City from December 2000 to July 2005, he successfully juggled wildly divergent constituencies. What's more, he was a child of the oilpatch: He spent his early years in Tepetitán, an off-the-beaten-path village with a couple of wells sunk into the ground.

But the Pemex of AMLO's childhood was vastly more successful than it is today. In 1953, the year he was born, the oil industry was booming in his home state of Tabasco. Nationwide, production had almost doubled over the previous 15 years. By 1968 it had doubled again.

There were always concerns that Mexicans at the bottom of society weren't getting a fair share of oil wealth, however. López Obrador, who'd worked as a bureaucrat and a college professor, latched on to that anger as he began his political career. After losing a controversial 1994 election for the state governorship—his opponent's campaign spending came under scrutiny—he joined activists who blockaded Pemex wells and rose to prominence when he appeared on television covered in blood following a clash with police.

In 2000, when he won Mexico City's mayoral election, López Obrador positioned himself as a pragmatic leftist. While he expanded social programs for senior citizens, single mothers, and the disabled, he was also willing to work with billionaire Carlos Slim on development projects and former New York Mayor Rudy Giuliani on crime-fighting initiatives.

AMLO used the job as a launchpad, running for president in 2006 on a left-wing agenda that included protecting Pemex from what he saw as efforts to privatize the company. He lost to center-right candidate Felipe Calderón by less than 1 percentage point, according to the official count, but claimed fraud and didn't accept the results. He and his supporters formed a symbolic shadow government and shut down the heart of the capital city with weeks of protests.

In the following years, as Calderón took steps toward modernizing Pemex, López Obrador led the resistance, packing arenas with angry citizens for hourslong rallies. He told his followers to close down airports, oil facilities, and highways to publicize their objections to Calderón's plans. "The country's oil belongs to the people, even the most humble," López Obrador ►

Poza Rica, seen from
Parque de las Americas

A capped, dried-up well in the División de Oriente neighborhood of Poza Rica

A Wild Ride for Mexico's Oil Bonds

Pemex note maturing in 2026, price change since Dec. 31, 2017

Source: {JK217725 Corp}

told protesters outside Pemex's Mexico City headquarters in 2008. "We must defend this historic conquest."

As Calderón's single six-year term was ending in 2012, López Obrador ran again for president. This time he lost by a much wider margin to another center-right politician, Enrique Peña Nieto.

Peña Nieto's administration finally achieved the cherished goal of the Mexican right: opening Mexico's energy industry to foreign investment. Although the timing wasn't ideal—the ink on the reforms was barely dry before the 2014-15 oil price crash—Mexican fields were attractive to international players such as BP, Chevron, Exxon Mobil, and Royal Dutch Shell.

In the end, Peña Nieto's government got bogged down in corruption allegations and the public's perception that the president and his wife, a former *telenovela* star, were disconnected from the realities of everyday life. That opened up space for López Obrador to run once again as a reformer in the July 2018 presidential election.

AMLO's National Regeneration Movement (Morena) promised something new: a government that would focus on fighting poverty and putting ordinary workers over the entrenched business interests that many believed were coddled by previous

An ad for Morena, López Obrador's political party, at a Pemex gas station in Papantla, near Poza Rica

administrations. He pledged to revive Pemex, shield it from foreign interference, and make it a company of the people again.

At home and abroad, business executives and investors blanched at what they heard; the peso, bonds, and stocks all suffered heavy losses in the lead-up to the vote. But much of the citizenry embraced it, sending AMLO to a resounding victory. In his ascent, pundits inevitably heard echoes of Donald Trump, Brazil's Jair Bolsonaro, and other unconventional politicians gaining ground around the world.

NOW, MORE THAN a year after the election, the problems plaguing Pemex are coming to a head, and its investors are increasingly restless.

Production plummeted to 1.68 million barrels a day on average in the first nine months of 2019, half what it was in 2004, and Mexico's most lucrative fields are drying up quickly. Investment is desperately needed, but the cash-strapped company dedicated about $2.5 billion to capital expenditures in the first nine months of the year, just 28% of its $9 billion target for the full year. That target was already not even half of Pemex's capital expenditures during some of Calderón's years in power.

While Pemex is profitable—earnings before interest, tax, depreciation, and amortization in the first nine months of the year reached $17 billion—most of that was wiped out by taxes and duties that totaled $13.9 billion in that span. "The issue is that the government takes all of that away," says Lucas Aristizabal, Latin America senior director at Fitch Ratings Inc. in Chicago.

AMLO's critics say his government has no realistic strategy to fix what's wrong. They dismiss the centerpiece of López Obrador's investment plan for Pemex—an $8 billion refinery in his home state—as a boondoggle, or worse. They say Pemex has no need for it, the business of turning crude into fuels is best left to someone else, and the project will divert attention away from its core business of drilling.

Construction hasn't yet started on the 340,000-barrel-a-day plant, though bulldozers are preparing the land for what's to come. It will siphon off more than 4 of every 5 pesos in additional funds the government allocated to Pemex from 2020 to 2022 as part of its five-year business plan.

Never mind that existing refineries were operating at only 40% of their potential in September because of underinvestment and a lack of light crude for processing, or that the plants lose ►

more money as they produce more, according to analysts. "It's cheaper for Pemex to buy gasoline [from abroad] rather than refine it in the country," says Ixchel Castro, an oil and refining markets manager for Latin America at Wood Mackenzie Ltd.

Even so, López Obrador's notion that another refinery will help curtail foreign involvement and influence in Mexico's oil business resonates with large swaths of the population that have long equated Pemex with national sovereignty.

PEMEX GREW OUT OF Mexico's expropriation of foreign companies' oil interests in 1938, a time when units of Royal Dutch Shell and Standard Oil Co. were dominant players. Mexican schoolchildren learn from their history books that citizens lined up outside the Palacio de Bellas Artes in Mexico City to donate silver, gold, and even chickens to pay for the takeovers. More than 80 years later, the *Día de la Expropiación Petrolera* is celebrated across the country on March 18, especially in oil regions.

López Obrador's detractors argue that his policies, rather than rescuing Pemex, could push it into insolvency. That would be devastating for the economy and for government revenue. Oil revenue accounted for about 18% of federal government income in the second quarter of 2019, whereas oil and gas contributed just 3.4% of Mexico's gross domestic product last year, less than half the level of 25 years ago. López Obrador's budget for next year depends in part on Pemex boosting production by about 16%, a rate of growth unseen in almost four decades.

Mexico needs to ditch the "pipe dream" of building refineries and integrate its energy industry with its northern neighbor's, says James Barrineau, a money manager at Schroders Plc, the third-largest holder of Pemex's peso-denominated debt. The failure to do so, he says, "is really the core reason why people have been cautious about AMLO."

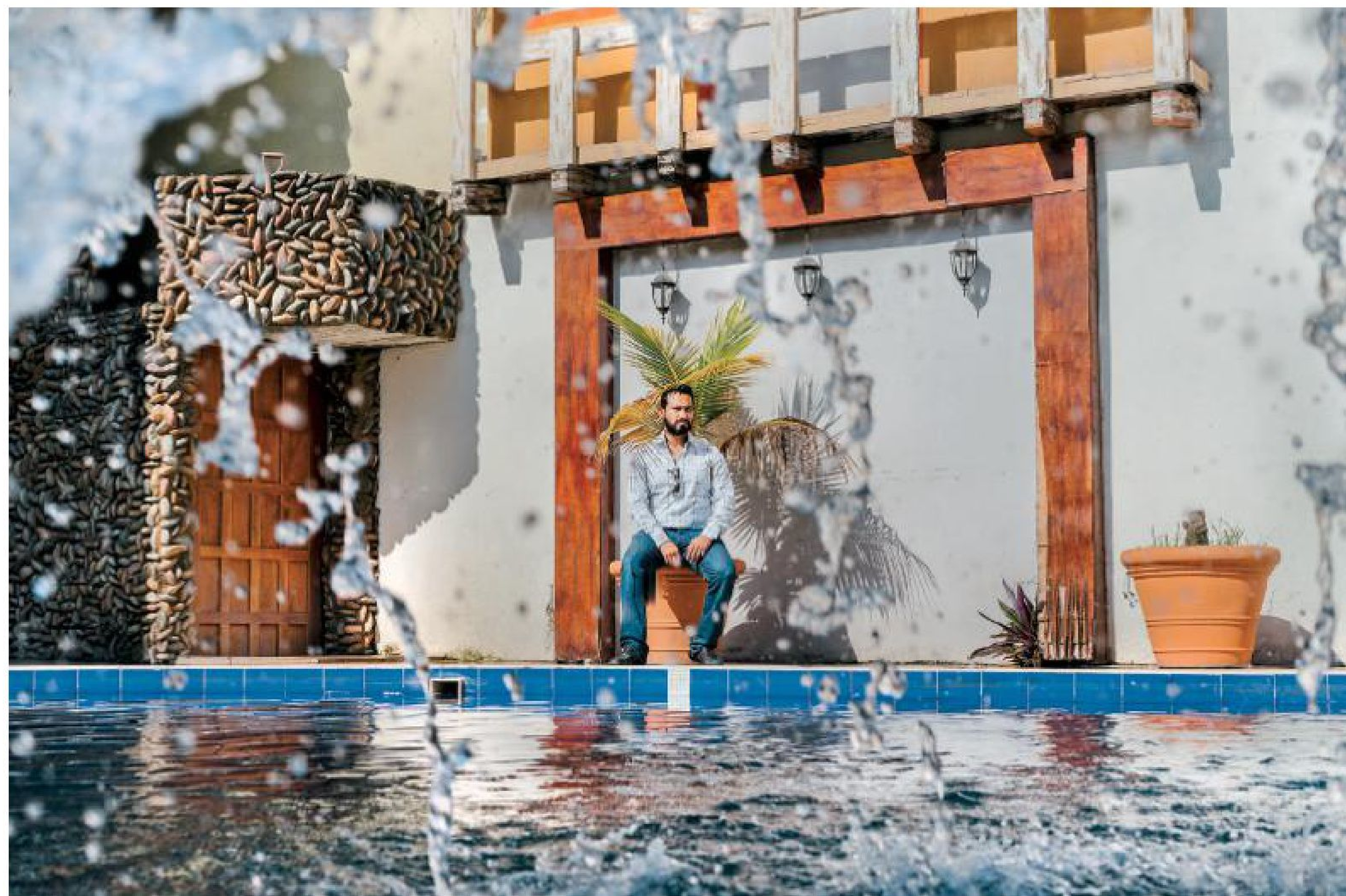
In June, Fitch Ratings downgraded Pemex's bonds to junk, citing the company's falling oil production and ballooning debt, and cut Mexico's sovereign debt rating, because of the government's close ties to the company. Moody's Investors Service Inc. and S&P Global Ratings have raised similar concerns.

Swaps traders are paying more to buy insurance against a default, with the cost of five-year contracts up more than 40% since the end of 2017. Bond buyers are demanding more than 4 percentage points of extra yield to hold Pemex's 10-year notes instead of similar-maturity U.S. Treasuries, almost three times the premium investors get on Mexico sovereigns.

López Obrador, meanwhile, has belittled the credit rating companies and ignored their recommendations to plow more funds into Pemex's oil production and exploration business, sell off noncore assets, and welcome private investment. "As soon as we arrived they started talking about how they were going to lower the rating," he said at a press conference in August. "I hope they are more careful in their analysis, more professional, more objective."

Recent government measures to shore up Pemex have helped keep the ratings companies at bay. In September the government pumped $5 billion into Pemex to help ease its debt burden, and the company sold $7.5 billion in bonds to refinance short-term debt. Pemex had already received $1.3 billion as part of the budget approved in December 2018. It's also gotten $1.5 billion in tax breaks and $1.8 billion in assistance with its pension obligations. In the first nine months of 2019, Pemex says, it saved $1.22 billion

Ostos, operations manager of Transervices Energy; Salinas at his family's hotel in Poza Rica



Poza Rica was supposed to be a boomtown. But the oil boom is a bust. Joblessness is rampant. Even some drug cartels that once terrorized the town have gone elsewhere

by reducing fuel theft and an additional $375 million or so by trimming its payroll of 124,000 and interest payments on its debt.

All that money isn't nearly enough to fund Pemex's needs, according to Andrés Moreno, chief investment officer of Afore Sura, Mexico's third-largest pension fund, which holds Pemex bonds. He says the company needs $10 billion to $15 billion a year in cash flow to reverse oil production declines, so the government support is just "a plug-in." "They are removing the emergency for the next two years, but it doesn't solve anything," Moreno says. "What is missing in Pemex's case is awareness of the emergency and willingness to put ideology in a drawer."

As an example of how things could work better, analysts and money managers point to Brazil's state-controlled oil company, Petróleo Brasileiro SA. To be sure, it's had plenty of problems of its own, including corruption and an enormous debt load of about $83 billion. But it does some things right: For two decades it's worked with foreign oil majors to develop vast reserves in deep-water fields off its coasts, allowing it to tap outside expertise as it gained experience in the highly technical drilling required there.

López Obrador's strategy to increase oil production by focusing on onshore and shallow-water fields is shortsighted, according to these analysts and money managers; it also fails to acknowledge the huge promise of Mexico's deep-water and unconventional acreage, which have much higher production potential but require foreign expertise and private investment.

"The current administration has made revamping Pemex—as we call it, 'making Pemex great again'—a priority," says Pablo Goldberg, a portfolio manager at BlackRock Inc., which owns Pemex debt. "Eventually, what we need to be seeing is the production capacity of Pemex going up. Some of this financial assistance [from the government] should give Pemex capital to invest. Now we have to see whether it's well done."

ON THE OUTSKIRTS OF Poza Rica, dried-up wells stretch into the distance, pockmarking surrounding citrus plantations. Chicontepec is estimated to hold about one-fifth of Mexico's oil and gas reserves. In the early 2000s—after the gigantic shallow-water field Cantarell, discovered in the 1970s, started to decline at an accelerated pace—government officials promised Chicontepec would be a boon to Mexico's production.

Pemex drilled thousands of wells over the following decade. In 2010 it contracted global firms, including Baker Hughes Co. and Halliburton Co., to develop top-of-the-line production-enhancing techniques at five new field laboratories. That attracted transport and logistics companies, equipment and service providers—all to meet the needs of Pemex and its contractors.

The black-gold rush didn't last long. The drilling proved far more complicated and expensive than Pemex anticipated. At its peak in 2012, Chicontepec contributed fewer than 70,000 of the nation's 2.5 million barrels in average daily output. The failure cemented Pemex's reputation for incompetence after executives squandered billions of dollars on it, financed mostly with debt.

During Peña Nieto's administration, Pemex officials acknowledged that Chicontepec was a failure, and the company drastically reduced its investment in the field. Poza Ricans, believing new oil investment was coming their way, supported López Obrador at the ballot box. Pemex's 2020 budget does call for doubling annual investment in Chicontepec to $319 million. But for the time being, Pemex's operations in the region have continued their steady decline.

Building a refinery in his home state hasn't helped AMLO's cause in Poza Rica (population: about 200,000). "It's disappointing that we voted for him and all the support in the energy sector has gone elsewhere," says Paola Ostos, operations manager of Poza Rica-based Transervices Energy, which shuttles workers and equipment to oil installations. "As a businesswoman, I feel that we've been forgotten. We were the principal oil zone of Mexico for many years, and now all the activity is being concentrated in the south."

Every March 18, Poza Rica still celebrates the *Día de la Expropiación Petrolera*. But life in the oilpatch isn't what it used to be. Residents say the festivities—which used to span several days and include a carnival—have lost much of their luster.

On the outskirts of Poza Rica at 9:30 a.m. on a late summer's day, the sun is already turning the sheet-metal homes in squatter communities into ovens. Overhead, plumes from a Pemex processing plant streak the sky. Day after day, the installation burns natural gas that seeps from Pemex's oil wells.

Salvador Reséndiz, president of the Business Coordinating Council for the northern region of Veracruz, says López Obrador promised Poza Rica a new plant during his presidential campaign. Although Pemex's 2020 business plan includes rehabbing the facility, Reséndiz worries that Poza Rica will be forgotten—and that the refinery in the president's home state will take precedence.

"It's very clear that in these first three years of the new government, all of the investment in Pemex is going south, south, south," he says. "When will it come north? When are they going to put money in Poza Rica?" ● *—With Sydney Maki, Eric Martin, and Nacha Cattan*

Stillman covers energy. Villamil covers emerging markets. They are based in Mexico City.

The Deutsche Bank CEO is slashing businesses in what some say is the

CHRISTIAN SEWING'S SHOCK WAS plain to see, the color draining from his face. The chief executive officer of Deutsche Bank AG had just unveiled his long-awaited plan to fix the troubled lender. It included a retreat from equities trading, a focus on corporate banking, and the elimination of 18,000 jobs, a fifth of the workforce. To underscore his conviction, he'd even pledged to invest a chunk of his own pay in Deutsche Bank stock every month.

Then he checked his phone. The shares were in free-fall; they lost as much as 7.3% that day, July 8, and tumbled again on July 9. Shareholders had reached the same, grim verdict: Sewing's goals were unrealistic for a bank that had consistently disappointed investors. His plan continued to rely on a global investment bank with shrinking revenue and a low-profit retail bank in a home market plagued by fierce competition and negative interest rates.

It was a sucker punch for the former risk manager. Sewing had spent his entire first year as CEO building up to this moment. He'd purged the management board of dissenters, wooed regulators and investors. He'd rejected an alternative strategy that some key stakeholders favored: merging with Deutsche Bank's German rival, Commerzbank AG. But the market reaction was a reminder that if his strategy was going to work, it wouldn't happen quickly, and there was no room for error.

History contains innumerable examples of corporate giants struggling to adapt to a changing world. What makes Deutsche Bank's story particularly resonant is not just that the risks involve a systemically important bank with a €1.5 trillion ($1.66 trillion) balance sheet. It's also the way the bank's fate follows the trajectory of corporate globalization over the last three decades.

In the 1990s and 2000s, the bank expanded rapidly overseas and took greater risks, at one point becoming the world's largest lender and a top trading firm. Then, in the wake of the 2008 credit crisis, both its business model and its reputation came under attack.

Even the proposed solution—Sewing, the first German citizen to serve as sole CEO in 16 years, with his plan to shrink the bank closer to its domestic roots—echoes the inward-looking political prescriptions that have gained prominence around the world. So now Deutsche Bank's global shareholders, including entities in Qatar and the U.S., are left to wonder how such a strategy can succeed in the 21st century.

The two wretched days in July were followed by more pain. Piecemeal cuts to the business by Sewing's predecessors had triggered a protracted fall in revenue without restoring profitability. Sewing pledged in the July announcement that revenue from businesses the bank is keeping, would grow 2% annually, to about

By STEVEN ARONS ILLUSTRATION BY JACK HUGHES

last option to revive the fortunes of the 150-year-old German megabank

€25 billion by 2022. But within weeks he had to acknowledge that lower interest rates made that goal more difficult. In September the bank softened the 2022 target to €24 billion to €25 billion. In October, when Deutsche Bank reported yet another quarter of declining revenue, the stock plunged again.

Each sell-off deepens the hole in which Sewing finds himself. The share price, now down about 90% from its peak in 2007, has fallen about 40% since he took over in April 2018. That ruled out any chance of asking shareholders for more money, leaving the CEO to draw down the bank's capital cushion to fund the new plan. With less and less room to maneuver, Sewing, 49, is axing the entire equities trading arm.

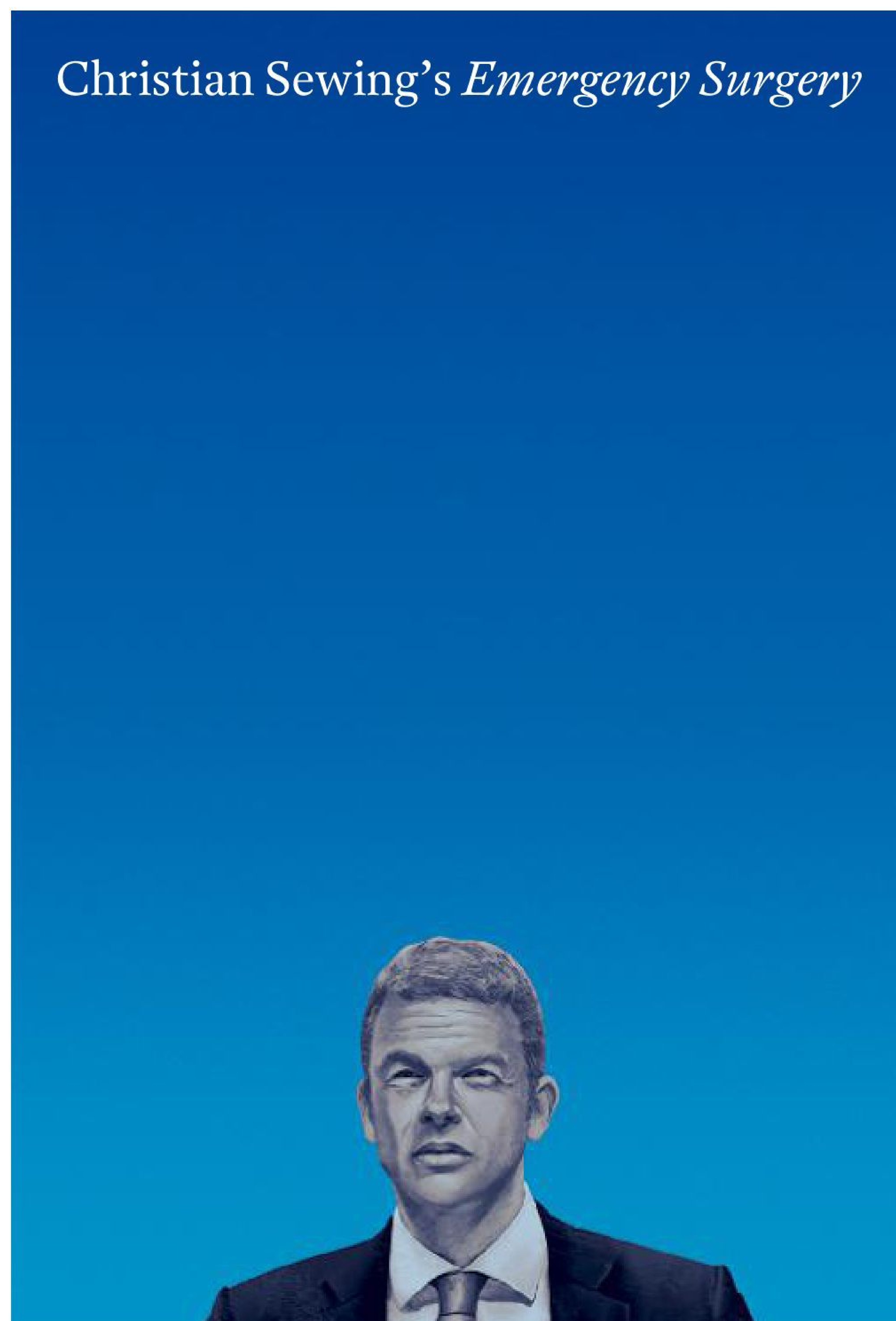
The more powerful trading business at Deutsche Bank has always been fixed income. In the years before the financial crisis, that unit expanded massively to become an industry leader and one of the company's biggest sources of revenue. But stricter postcrisis regulations, higher capital requirements, and negative interest rates have all made it harder to make money. Sewing has been cutting jobs in the areas that trade interest rate-related securities. The bank has vowed to turn around the shrinking unit, but the October results—in which fixed income led the revenue decline—once again underscored the challenge.

Sewing's surgery is all part of a last-ditch effort to salvage the limbs that are still functioning. Should he fail, Deutsche Bank, which celebrates its 150th anniversary in March, will have few options: sell more businesses, be acquired, or—given its crucial role in keeping Germany's export economy humming—face the prospect of being nationalized.

A former top executive at the bank who knows the CEO well frames the predicament this way: Sewing is the bank's "last option." There's no alternative. If he can't fix it, Deutsche Bank will fall apart.

Paul Achleitner, the chairman who's presided over failed turnaround efforts by Sewing's predecessors since 2012, sees it differently: "Deutsche Bank has gone through quite a few crises during its 150 years of history, but it was always able to find exceptional executives to lead it out of those," he says. "And I'm convinced Christian Sewing will be one of these critical leaders."

IN EARLY 2018, with then-CEO John Cryan on his way out, Achleitner asked Sewing what he would do differently. One of two deputy CEOs at the time, Sewing used his ski vacation in Lech, Austria, to write a 40-page paper outlining much of what would eventually end up in his strategy announcement. He drew heavily on ►



Christian Sewing's *Emergency Surgery*

his history in the corporate bank, the division that provides profitable basic financial plumbing services such as cash management, trade finance, and payment services. His wife drove the 475 miles back home to Osnabrück so he could keep scribbling in the passenger seat.

He still lives in the rural northwest of Germany where he grew up. On weekends he can occasionally be seen having a beer at a local Greek restaurant. Unlike four of his five most recent predecessors, Sewing lacks experience in investment banking. He hasn't worked at a big consulting firm or graduated from a prestigious college. He finished high school with a middling grade (a 2.4 average, equivalent to a B-) and did an apprenticeship at Deutsche Bank before getting a diploma from the Bankakademie Bielefeld and Hamburg.

His strengths lie elsewhere. "He knows how to cope with setbacks, which probably helps him in his current role," says Wolfgang Kirsch, the former CEO of DZ Bank AG, the parent company of DZ Hyp AG, a mortgage lender where Sewing was a management board member from 2005 to 2007, his only stint outside Deutsche Bank.

Sewing is levelheaded and straight-talking. People who've worked with him unanimously praise his ability to execute a plan once it's decided. He's less comfortable, some say, with big strategic decisions. He was always one of the quieter management board members and is less skilled at presenting a sweeping vision for the bank than his predecessors, they say. One former colleague says Sewing had an instinct for what was important and achievable. Another says he's relentless in following up on targets but will hesitate to make conceptual decisions until he feels he has enough details.

These people—and more than a dozen other former and current colleagues interviewed for this story—asked for anonymity to discuss their views in private. Sewing declined requests for an interview or comment.

For Deutsche Bank, a focus on execution may not be a bad thing. By the time Sewing took charge, years of expansion and takeovers had left the bank with multiple fiefdoms and competing centers of power. Management board members blamed one another for the troubles instead of working as a team, according to people familiar with the matter. Sewing responded to the infighting, which he has called "Deutsche Bank's disease," by replacing top managers with executives he trusted, almost all of them German.

First, Kim Hammonds, the operating chief who called the bank "the most dysfunctional" company she'd ever worked for, was replaced with Frank Kuhnke, a Deutsche Bank lifer Sewing knew from when they'd worked together in Japan. Nicolas Moreau, the Frenchman leading the bank's DWS asset management unit, was replaced by Asoka Wöhrmann, who hails from the same region as Sewing. In the July restructuring, Sewing ousted three more executives and took control of the investment bank from Garth Ritchie, shifting the center of power firmly back to Frankfurt from London.

AFTER THE DISAPPOINTING third-quarter results in October, Sewing promoted Fabrizio Campelli, a former head of strategy who most recently led the bank's wealth management division, to a newly created role as head of transformation. He also recruited Michael Ilgner, a former Olympic water polo player who was leading the German Sport Aid Foundation, to helm human resources.

In 2018, while he cemented his control over the company, Sewing was still grappling with the plan to focus Deutsche Bank on corporate banking that he'd formulated on the ski trip. As a first step, he'd announced a 25% reduction in headcount at the equities business shortly after taking over and was now waiting to see if that was enough.

By late December, it became clear that it wasn't—and Sewing roped in one of his closest advisers, Alexander von zur Mühlen. They'd worked together under Hugo Bänziger, the chief risk officer at the time and one of Sewing's most important mentors. "The two had a great connection," recalls Bänziger, who left Deutsche Bank in 2012. "They were my key employees."

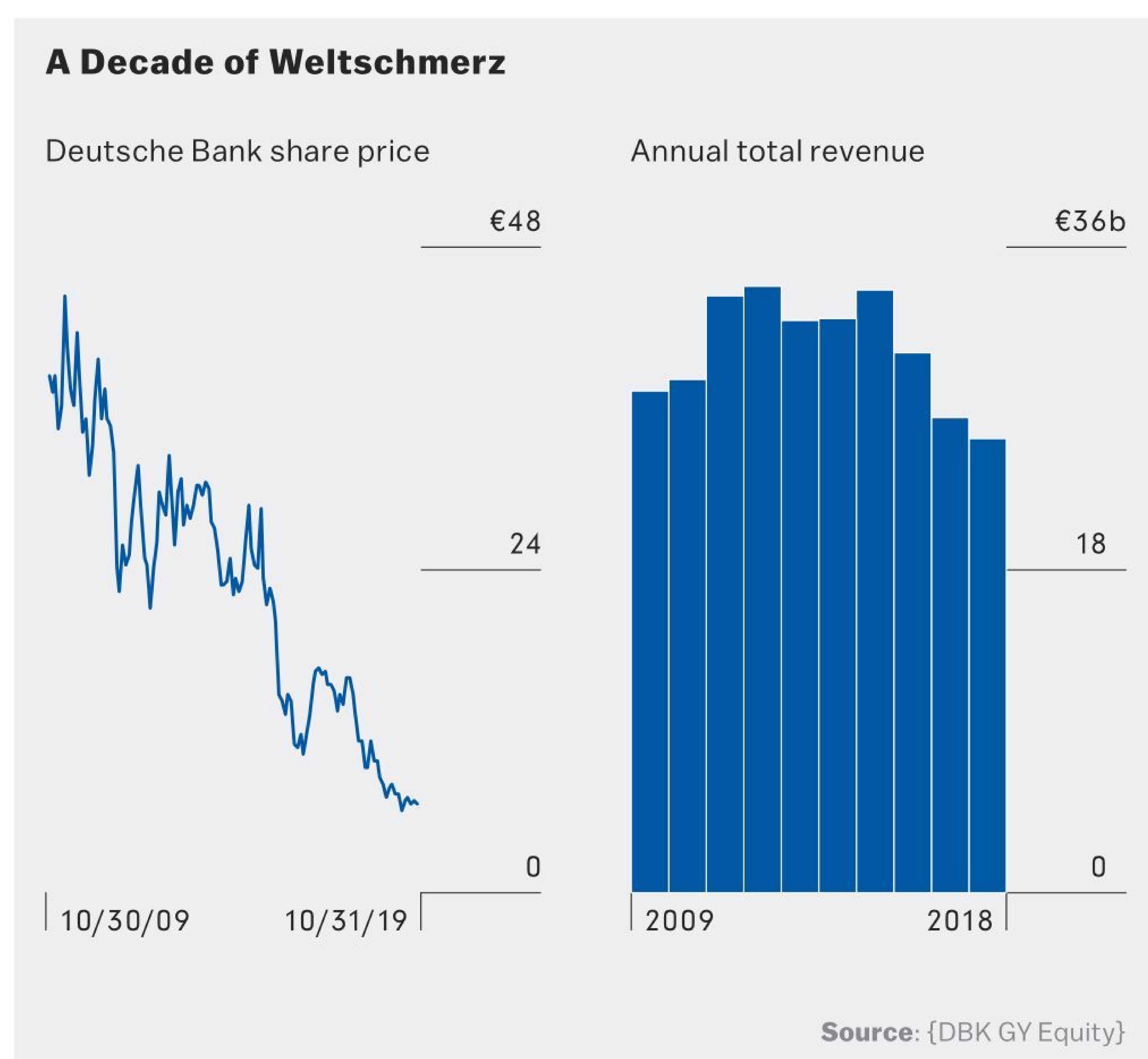
Von zur Mühlen's investment banking background—he'd served as co-head of global capital markets—helped Sewing build on the paper he'd drawn up during his ski vacation. They looped in more executives, including investment banking chief financial officer Christiana Riley, who now runs the bank's U.S. operations, to flesh out what became internally known as "Project Cairo." It was soon clear that much, much more of the trading business needed to go.

It was a difficult decision, though less so for Sewing than for Achleitner. As a young dealmaker at Goldman Sachs Group Inc. in Germany, Achleitner had advised Deutsche Bank on its 1998 purchase of Bankers Trust, turning the German lender into a trading giant and, briefly, into the world's largest bank.

Achleitner remained a defender of a strong securities business when he became Deutsche Bank's chairman 14 years later, but the world had changed. The industry's years of global expansion and aggressive risk-taking had resulted in the 2008 financial crisis, spurring tougher financial rules and a populist backlash against globalization.

For banks, regulators made trading a lot more expensive, and authorities caught up with large-scale misconduct—from the sale of toxic mortgage bonds to market manipulations and money laundering. Deutsche Bank alone paid more than $18 billion in fines in the decade following the crisis. Efforts by central banks to stimulate economic growth, especially in Europe, resulted in negative interest rates that have eroded income from lending.

In an effort to preserve the core of Deutsche Bank's investment



Source: {DBK GY Equity}

PREVIOUS SPREAD: PHOTO: DANIEL ROLAND/AFP/GETTY IMAGES

> **“The future of fixed-income trading continues to be a crucial issue for the bank”**

bank, Achleitner in early 2019 encouraged merger talks with Commerzbank, a struggling German rival. He saw Commerzbank’s large deposit base as a way to help cut funding costs for the securities unit. Germany’s finance ministry and Cerberus Capital Management LP, a top shareholder in both banks, were also in favor.

Sewing was skeptical of a merger that would expand the bank’s presence in the overcompetitive German market. But with three key stakeholders breathing down his neck, he put aside Project Cairo and started crunching the numbers. The talks were formally announced on March 17. Commerzbank CEO Martin Zielke pushed for a quick decision because employees were unhappy and opposition started to form, but Sewing sought more time to figure out the cost savings a transaction would bring.

Meanwhile, Sewing was quietly exploring a much bolder option, one that would have upended the banking world. Deutsche Bank and Switzerland’s UBS Group AG held preliminary discussions about a megamerger that would have created continental Europe’s biggest financial institution. The talks, codenamed “Project Santiago,” grew out of stalled negotiations to combine the banks’ asset management businesses. But they, too, fizzled.

The Commerzbank talks were extended, sending employees to work on due diligence over the Easter holidays, but the potential cost savings just didn’t add up. In his days as a risk manager, Sewing had learned how to put a brake on deals being pushed by hard-charging investment bankers. With Project Cairo in the wings, and the benefits of a Commerzbank deal uncertain, he walked away, despite the support for the deal from Cerberus, the finance ministry, and his own chairman.

It was a bold move for a CEO just a year into the job, say people close to the decision. But shareholder support for Achleitner had begun to wane after years of unsuccessful turnaround efforts. At the annual general meeting, he bore the brunt of shareholders’ frustration, with one asking why the chairman kept his job when even the leader of the Catholic church, German Pope Benedict XVI, had stepped down from his lifetime role.

Deutsche Bank’s biggest shareholders went even further, directly approaching candidates to gauge their interest in replacing Achleitner. Some representatives of the Qatari royal family, which owns a combined stake of more than 6%, held talks with an international recruiting firm and reviewed potential executives, people familiar with the matter say. They’re debating whether to try to force the chairman out before his term expires in 2022.

That gives Sewing an important advantage over his predecessors. One former executive describes the dynamic this way: Achleitner needs Sewing, but Sewing doesn’t need Achleitner, and they both know it. For his part, Sewing has said he’s glad to have Achleitner as chairman.

THE END OF the Commerzbank talks on April 25 set off a flurry of planning as Sewing decided how much surgery would be needed to restore Deutsche Bank to profitability. After five years of negative interest rates in Europe, Chief Financial Officer James von Moltke and his team were working on the assumption that rates would eventually rise.

But the trade war between the U.S. and China weighed heavily on Europe’s export economy, and expectations for higher rates reversed. By the time the bank announced new targets, the underlying assumptions were out of date. At least one major shareholder, according to people familiar with the matter, had warned the bank before Sewing’s July announcement that it shouldn’t use inflated targets, especially given its history of overpromising and underdelivering. In September, to account for the increased headwinds from the economy and interest rates, the bank softened its revenue target. Regulators generally support the CEO’s plan, but a few of his decisions have raised eyebrows. Some regulators approached him to express concern that running the investment bank is too big to be treated as a side job. They’ve also balked at Sewing’s decision to nominate Ilgner, who lacks banking experience, to the management board.

INVESTORS SAY THAT Sewing has made important strides, including selling down unwanted assets and winning a nod from regulators to tap into the bank’s capital buffers to fund the restructuring. But walking back the revenue target dented his credibility. Most importantly, Sewing has yet to show he can bring in revenue and restore a competitive level of profitability to reverse the long decline in the stock.

“Sewing has filled some key leadership positions, but he hasn’t actually achieved much else yet,” says Michael Hünseler, a credit fund manager at Assenagon Asset Management in Munich. “The future of fixed-income trading continues to be a crucial issue for the bank.”

Sewing supports the idea of European banks combining to help restore their profitability. But he also knows that, given Deutsche Bank’s current valuation, he would be the junior partner in any negotiation. So for now he’s left reversing the aggressive growth born in the era of global corporate expansion. As he prepares Deutsche Bank for a new phase of consolidation, driven by tougher regulation, Sewing has a last chance to get it right. ●

Arons is a reporter at Bloomberg in Frankfurt.

ASYMMETRIC WARFARE

In a world where
a keyboard
can cause more
damage than
a gunship,
a corporate
cyberattack victim
and its insurers
have gone to
court to figure
out what's covered
and what's not

By DAVID VOREACOS,
KATHERINE CHIGLINSKY,
and RILEY GRIFFIN

ILLUSTRATION BY
JOAN WONG

By the time Deb Dellapena arrived for work at Merck & Co.'s 90-acre campus north of Philadelphia, there was a handwritten sign on the door: The computers are down.

It was worse than it seemed. Some employees who were already at their desks at Merck offices across the U.S. were greeted by an even more unsettling message when they turned on their PCs. A pink font glowed with a warning: "Ooops, your important files are encrypted.... We guarantee that you can recover all your files safely and easily. All you need to do is submit the payment..." The cost was $300 in Bitcoin per computer.

The ransom demand was a ruse. It was designed to make the software locking up many of Merck's computers—eventually dubbed NotPetya—look like the handiwork of ordinary criminals. In fact, according to Western intelligence agencies, NotPetya was the creation of the GRU, Russia's military intelligence agency—the same one that had hacked the Democratic National Committee the previous year.

NotPetya's impact on Merck that day—June 27, 2017—and for weeks afterward was devastating. Dellapena, a temporary employee, couldn't dig into her fact-checking work. Interns and temps bided their time at their desks before some of them were sent home a week later. Some employees gossiped, their screens dark. Others watched videos on their phones.

In all, the attack crippled more than 30,000 laptop and desktop computers at the global drugmaker, as well as 7,500 servers, according to a person familiar with the matter. Sales, manufacturing, and research units were all hit. One researcher told a colleague she'd lost 15 years of work. Near Dellapena's suburban office, a manufacturing facility that supplies vaccines for the U.S. market had ground to a halt. "For two weeks, there was nothing being done," Dellapena recalls. "Merck is huge. It seemed crazy that something like this could happen."

As it turned out, NotPetya's real targets were half a world away, in Ukraine, which has been in heightened conflict with Russia since 2014. In the former Soviet republic, the malware rocketed through government agencies, banks, power stations—even the Chernobyl radiation monitoring system. Merck was apparently collateral damage. NotPetya contaminated Merck via a server in its Ukraine office that was running an infected tax software application called M.E.Doc.

NotPetya spread. It hopped from computer to computer, from country to country. It hit FedEx, the shipping giant Maersk, the global confectioner Mondelēz International, the advertising firm WPP, and hundreds of other companies. All in all, the White House said in a statement afterward, it was the "most destructive and costly cyberattack in history."

By the end of 2017, Merck estimated initially in regulatory filings that the malware did $870 million in damages. Among other things, NotPetya so crippled Merck's production facilities that it couldn't meet demand that year for Gardasil 9, the leading vaccine against the human papillomavirus, or HPV, which can cause cervical cancer. Merck had to borrow 1.8 million doses—the entire U.S. emergency supply—from the Pediatric National Stockpile. It took Merck 18 months to replenish the cache, valued at $240 million. (The Centers for Disease Control and Prevention say the stockpile's ability to deliver medicine wasn't affected.)

Merck did what any of us would do when facing a disaster: It turned to its insurers. After all, through its property policies, the company was covered—after a $150 million deductible—to the tune of $1.75 billion for catastrophic risks including the destruction of computer data, coding, and software. So it was stunned when most of its 30 insurers and reinsurers denied coverage under those policies. Why? Because Merck's property policies specifically excluded another class of risk: an act of war.

Merck went to court, suing its insurers, including such industry titans as Allianz SE and American International Group Inc., for breach of contract, ultimately claiming $1.3 billion in losses.

In a world where a hacker can cause more damage than a gunship, the dispute playing out in a New Jersey courtroom will have far-reaching consequences for victims of cyberattacks and the insurance companies that will or will not protect them. Until recently, the big worry associated with cyberattacks was data loss. The NotPetya strike shows how a few hundred lines of malicious code can bring a company to its knees.

As the nascent cyber insurance market has grown, so has skepticism about pricing digital risk at all. Few people understand risk as well as Warren Buffett, who's built conglomerate Berkshire Hathaway Inc.—and one of the world's biggest personal fortunes—on the back of insurance companies such as Geico and National Indemnity Co. "Frankly, I don't think we or anybody else really knows what they're doing when writing cyber," he told investors in 2018. Anyone who says they have a firm grasp on this kind of risk, he said, "is kidding themselves."

Those who could be on the receiving end of cyberattacks don't underestimate the peril. Asked in September what kept him up at night, BP Plc Chief Executive Officer Bob Dudley said that aside from the transition away from fossil fuels, the threat of a catastrophic cyberattack worried him most. "It's the one that you can have the least control of," Dudley said on a call with investors. "That one keeps me awake at night."

The depths of these concerns show why the fight between Merck and its insurers is not only about what happened on a summer's day in 2017. It's about what companies and their insurers fear lurks over the horizon.

UNION COUNTY'S IMPOSING 17-story neoclassical courthouse in Elizabeth, N.J., is a 15-minute drive from Merck's global headquarters in Kenilworth. It's also relatively conveniently located for the phalanxes of East Coast lawyers, from firms such as Covington & Burling and Steptoe & Johnson, who come here to do battle over the Merck case.

Their numbers are growing. One Monday in November, a dozen dark-suited lawyers filed into Judge Robert Mega's 14th-floor courtroom. They were there to discuss *pro hac vice* ("for this time only") applications to allow five additional colleagues to practice temporarily in New Jersey.

Merck has already collected on some property insurance policies that specify coverage for cyberdamage while also settling with two defendants in the lawsuit for undisclosed amounts. One that settled, syndicate No. 382 at the insurance marketplace Lloyd's of London Ltd., was in a group that covered losses only if they ranged from $1.15 billion to $1.75 billion. A spokesman for CNA Financial Corp., which is tied to the syndicate, declined to comment.

The lawsuit in Union County addresses only property insurance claims. The $1.3 billion in losses that Merck claims includes

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expenses such as repairing its computer networks and the costs of business that was interrupted by the attack. Units of Chubb Ltd., Allianz, and other insurers have denied coverage on grounds that NotPetya was a "hostile or warlike" act or an act of terrorism, which are explicitly excluded by their policies.

As far as Merck is concerned, it was struck not by any of those excluded acts, but by a cyber event. "The 'war' and 'terrorism' exclusions do not, on their face, apply to losses caused by network interruption events such as NotPetya," the company's lawyers wrote in an Aug. 1 filing. "They do not mention cyber events, networks, computers, data, coding, or software; nor do they contain any other language suggesting an intention to exclude coverage for cyber events."

Lawyers for the insurance companies declined to comment for this story, as did Merck's attorneys. Merck declined to comment on the hack or the lawsuit beyond what's in their public filings. Addressing the broader issue, Merck Chief Financial Officer Robert Davis says, "We continue to make sure we fully invest to protect ourselves against the cyberthreats we see." He didn't disclose how much Merck spends on cybersecurity.

The courts in the U.S. struggled with these matters long before cyber came along. Even under clearer circumstances—as when the Japanese bombed Pearl Harbor on Dec. 7, 1941—lawsuits between insurers and victims over similar exclusions tied U.S. courts in knots. In cases involving life insurance payouts after Pearl Harbor, courts in different parts of the country split, with some judges ruling that the exclusions didn't apply and other judges saying they did.

The NotPetya attack will catapult the U.S. legal system into even murkier terrain. Nation-states for years have been developing digital tools to create chaos in time of war: computer code that can shut down ports, tangle land transportation networks, and bring down the electrical grid. But increasingly those tools are being used in forms of conflict that defy categorization, including the 2014 attack that exposed emails and destroyed computers at Sony Pictures Entertainment Inc. The U.S. government blamed that attack on North Korea. Sony settled claims by ex-employees.

In the Merck lawsuit, the insurers may well see an opportunity to test their legal theories and find out if they can meet their burden of proving that war exclusions should apply. Fighting in eastern Ukraine between Russian-backed separatist forces and Ukraine's military has killed thousands. Speaking about NotPetya, Olga Oliker, a senior adviser to the Washington-based Center for Strategic and International Studies, said in testimony before the U.S. Senate in March 2017, "If this was, indeed, an orchestrated attack by Russia, it is an example of precisely the type of cyber operation that could be seen as warfare, in that it approximates effects similar to those that might be attained through the use of armed force."

Informed analysis doesn't equal the evidence insurance companies really want, however. If there is "smoking gun" proof that would be useful to the insurers' legal arguments, it probably resides out of reach: in classified U.S. or U.K. intelligence assessments that may have been based on intercepted communications and evidence obtained by hacking the attackers' computers. Even so, Philip Silverberg, a lead lawyer for the insurers, wrote to Judge Mega on Sept. 11, "The insurers are confident that there is evidence to demonstrate attribution of NotPetya to the Russian military."

To get it, the insurers will lean on the work of computer forensic experts who've analyzed NotPetya and may be able to testify that it bears the hallmarks of a Russian military operation. That analysis is complicated, because attackers often mask their identities and can mislead investigators. The insurers may get a little help from the Trump administration. In its February 2018 statement, the White House said NotPetya "was part of the Kremlin's ongoing effort to destabilize Ukraine and demonstrates ever more clearly Russia's involvement in the ongoing conflict."

"When the president of the United States comes out and says, 'It's Russia,' it's going to be hard to fight," says Jake Williams, a former National Security Agency hacker who now helps companies hunt for vulnerabilities in their computer networks. "I'll be surprised if the insurance companies don't get a win. This is as solid a case as they're going to get."

In addition, the insurers are likely to probe whether Merck did as much as it could to defend itself against a NotPetya-like attack: Was the company, for example, vigilant in updating its computer software?

The arguments and counterarguments unfolding in Elizabeth are sometimes arcane and convoluted. But what triggered them is plain to see. The attack that ricocheted around the world on June 27, 2017, was "the closest thing we've seen" to a cyber catastrophe, says Marcello Antonucci, global cyber and technology claims team leader at insurer Beazley Plc. "NotPetya was a wake-up call for everybody."

SCOTT STRANSKY WAS IN elementary school in 1992 when Hurricane Andrew blew through the Bahamas, Florida, and Louisiana, killing more than two dozen people and wrecking tens of thousands of homes. At the time, his family was vacationing in Hawaii, flying out just before the islands were battered by Hurricane Iniki, the worst in the state's history.

Such cataclysmic events do more than take lives, destroy homes, and wreck infrastructure. They cut a path of destruction through the insurance business as well: About a dozen underprepared insurers went out of business in Andrew's aftermath. Later in life, Stransky, who studied mathematics and ►

"For two weeks, there was nothing being done. Merck is huge. It seemed crazy that something like this could happen"

A Decade at War

A new era of cyberattacks to destroy systems or hijack data began with assaults by nation-states that were eventually copied by criminal groups

2009 into 2010	August 2012	February 2014	November 2014	December 2015
Stuxnet Cybersecurity experts blamed this malware for a devastating attack on Iran's nuclear processing facilities. Stuxnet is widely believed to have been designed by hackers working for the U.S. and Israeli governments.	**Saudi Arabian Oil Co.** A computer virus that hit Aramco affected at least 30,000 personal computers. The oil giant vowed to fortify its network, with leaders saying at the time that it wasn't the first attack and likely wouldn't be the last.	**Las Vegas Sands Corp.** Hackers attacked Sheldon Adelson's casino company, gaining control of a website and posting content criticizing the billionaire. James Clapper, who was U.S. director of national intelligence, confirmed in 2015 that Iran was behind the hack.	**Sony Pictures Entertainment Inc.** Hackers besieged Sony, stealing new movies and debilitating thousands of computers. U.S. government officials attributed the attack to North Korea. In 2018 the U.S. charged a North Korean hacker for crimes stemming from this and the WannaCry hacks.	**Ukraine Power Grid** In the first known cyberattack on an electricity grid, hackers knocked out power to about 225,000 customers of three Ukrainian companies for several hours. Cybersecurity experts blamed Russia.

atmospheric science at MIT, went to work helping insurers model their exposure to the next Andrew or Iniki.

Data obsession crosses into Stransky's private life. Sitting in his office in downtown Boston, the hiking and travel fanatic rattles off the number of U.S. national park sites he's visited (399 of 419), interstate borders he's crossed (96 of 107), and times he's stood at spots where three U.S. states meet (12 of 38).

About six years ago, Stransky decided to turn his skills to cybersecurity. Hacks were getting bigger. The 2013 attack on Target Corp., which exposed the financial or personal data of at least 70 million people, led him to talk to his boss about developing a new form of cybermodeling.

Billions of calculations later, Stransky, who turns 36 in December, is vice president and director for emerging risk modeling at AIR Worldwide, a unit of Verisk Analytics Inc. He leads a team—data geeks, Ph.D.s, even a certified ethical hacker who worked at the U.S. Department of Defense—that creates and stress-tests models designed to assess future cybercosts.

The tools deployed by the group are especially useful to insurance companies tapping into the lucrative cyber insurance market. The armaments include thousands of insurance claims as well as data from internet sensors that track traffic between corporations and business partners, sniffing out malware or determining if network ports are vulnerable to incursions by outsiders.

For companies and their insurers, the numbers are daunting. The cost to businesses and insurers of a single global ransomware attack could hit $193 billion, with 86% of that uninsured, according to a 2019 report from a group that includes Lloyd's of London. The figure for Andrew's insured losses alone was an estimated $15 billion. Some estimates of total annual business losses from data breaches rise to more than $5 trillion by 2024. "We're always looking to simulate what the Hurricane Andrew of cyber would be," Stransky says. "NotPetya is not even close to the worst-case scenario. It can get much, much worse."

As the Merck case is highlighting, the insurance industry's exposure to cyberdamage is almost incalculably hard to grasp. The problem isn't the relatively modest pool of cyberpolicies that insurers are writing; they amounted in the U.S. to $3.6 billion in premiums in 2018, according to the National Association of Insurance Commissioners. The bigger worry is that cyberattacks could spill over into the vastly deeper pool of property casualty policies that insurers wrote in the U.S. in 2018—$621 billion worth in all.

Buffett's notion—that experts like Stransky are "kidding themselves"—nags at Stransky. Cyber events are in important ways not like weather events. There's far less data because companies often hide what happens to them or downplay the damage. Furthermore, hacks and the defenses against them are not governed by ecology or physics. Hackers have so-called zero-days—computer vulnerabilities known only to them and for which there is no defense. And it's almost impossible to predict what a Russia or an Iran might do based on its past actions.

Stransky concedes all of that, but he remains optimistic that his data work will help clarify the clouded picture faced by insurers and their clients. "I'm not going to say this is the panacea," he says. "It's just one part of the process."

IN A DARKENED ROOM across the river from the Lincoln Memorial in Washington, two dozen analysts watch row upon row of monitors as streams of data on the computer health of 150 companies scroll past. Protected by steel doors with facial-recognition locks, this is the so-called watch floor in Deloitte & Touche LLP's Cybersphere—the place where the accounting firm tracks the minutiae of the world's cyberthreats for its customers, scouring for malware and other signs of intruders.

The cybersecurity business is booming at Deloitte, as it is at companies such as FireEye, CrowdStrike Holdings, and Check Point Software Technologies. Deloitte's U.S. cyber unit employs 4,500 people, and the watch floor sits at its heart. It's overseen by Andrew Morrison, who leads Deloitte's Cyber Strategy, Defense, and Response practice.

Deloitte sends out teams to help companies recover data and network capabilities in the midst of cyberattacks. After NotPetya struck, a Deloitte team launched a recovery operation for A.P. Moller-Maersk A/S, the world's largest container shipping company. The attack left Maersk's container ships stranded at sea, closed ports, and ruptured communications. Within 10 days, Maersk reinstalled its entire computer infrastructure, including

December 2016	May 2017	June 2017	March 2018	March 2019
Kyiv Power Grid	**WannaCry**	**NotPetya**	**Atlanta**	**Norsk Hydro ASA**
Cyberattackers shut down power to part of Kyiv for about an hour. Cybersecurity experts blamed the same hackers who struck a year earlier and said the Kyiv incident appeared to be a test run for later strikes.	This ransomware attack crippled parts of Britain's National Health Service and encrypted hundreds of thousands of computers worldwide. U.S. authorities blamed North Korea.	A computer worm spread from Ukraine to companies around the world, causing billions of dollars in damage. The U.S., the U.K., and other countries later blamed the Russian military.	Ransomware compromised the city's computers, causing millions of dollars in losses. The two Iranian hackers who were indicted were separately charged with extorting more than 200 victims, including hospitals, the University of Calgary in Alberta, and the cities of Atlanta and Newark, N.J., over almost three years.	A ransomware hack forced Norsk Hydro, a Norwegian aluminum maker, to shut down several of its automated product lines and switch smelters to manual mode.

Source: Bloomberg reporting

4,000 servers and 45,000 PCs, according to Chairman Jim Hagemann Snabe.

A few years before NotPetya, China's military and intelligence agencies were stealing the secrets of global corporations at an alarming rate, giving a boost to the cybersecurity business. Most experts agree that threat has abated in the wake of a 2015 U.S.-China cybersecurity agreement and a reorganization of the Chinese military.

New and increasing threats are coming from ransomware and other malicious code designed to hijack, destroy, or alter data. Victims come in all sizes. Petty criminals, to cite one example, regularly use ransomware to lock up patient data in dentists' offices in capers that bring in a few thousand dollars. But for the most sophisticated cybercriminals, the choice targets are companies that make up a nation's infrastructure: manufacturers, power companies, gas pipeline operators, banks.

And yet Morrison's team is busier than ever. Manufacturers, including aluminum companies with smelters valued at almost $1 billion that could be ruined in a cyberattack, are particularly vulnerable, Morrison says. "Taking down the manufacturing facility, taking down the supply chain, all have dramatic impacts," he says. "Clients generally aren't as well-prepared in that space, because it's legacy equipment run by a shop steward on a machine floor and it's very difficult to secure."

That risk has increased as more industrial companies use interconnected devices that are embedded in their systems. Earlier this year, a ransomware attack hit aluminum producer Norsk Hydro ASA, halting production at some plants that fashion the metal into finished products. As manufacturers upgrade industrial systems, cyberattacks threaten to cripple production and ripple through supply chains.

Given how scary the future looks, the Merck case is, in some ways, an effort by insurers to turn back the clock. They want clarity. The industry is working to write its policy exclusions in such a way as to avoid any confusion over whether a digital attack is covered or not.

Standalone cyberpolicies give insurers the clarity they want. But property policies historically haven't taken into account the potential damage in a cyberattack. This raises the dread prospect of what's known as "silent cyber"—the unknown exposure in an insurer's portfolio created by a cyber peril that hasn't been explicitly excluded or included.

Insurers such as AIG or the underwriters governed by Lloyd's are now tightening the language around what events they'll cover. Lloyd's said in July that certain policies must state more clearly whether cyberattacks are covered. AIG said that starting in January, almost all of its policies for businesses should make that clear, culminating a six-year effort.

In Elizabeth, the action has been going on behind closed doors. Witnesses will testify on such subjects as what insurers intended in drafting exclusions for acts of war or terrorism and what Merck believed its coverage meant. Some insurers drafted new war or cyber exclusions for policies after NotPetya, but Judge Mega ruled that insurers don't have to disclose documents showing why they changed their policies after the attack.

In early 2020, experts will testify behind closed doors as to what constitutes an act of war in the cyber age. The case could be settled at some point—or it could drag on for years before going to trial.

The challenge for insurers is to show that NotPetya was an act of war even though there's no clear definition in U.S. law on what that means in the cyber age. Mega will also have to analyze international law, says Catherine Lotrionte, a former CIA lawyer who's taught at Georgetown University. "It's not going to be an easy case for a judge in the U.S. to declare that this was an act of war," she says. "It's not just whether another country did it, but does it meet the legal criteria under international law for an armed attack?"

Whichever way the courts rule, one stark reality is clear: The era of cyberweapons is forcing companies to defend themselves against a scale of threat that, in the conventional world, would have merited government help. With the insurance companies working to protect themselves against cyber risk, and because there's only so much that governments can do, companies such as Merck have no choice but to build their own defenses to manage risk. ● —*With Kelly Gilblom*

Voreacos covers financial investigations, Chiglinsky covers insurance, and Griffin covers the drug industry. They are based in New York.

Dawn Fitzpatrick

The chief investment officer of Soros Fund Management since 2017 previously helped oversee trading at UBS Group AG's money management arm. Here she divulges some off-duty habits and preferences to Bloomberg TV's Francine Lacqua, co-anchor of *Bloomberg Surveillance* and host of *Leaders With Lacqua*.

How many hours of sleep do you get a night?
Seven and a half.

What time do you set your alarm to wake up?
5:30 a.m.

Are you a morning or evening person?
Morning.

What's your typical workout?
A 5-mile run.

What's your favorite sport or sports team?
College hoops.

Which app is in heavy rotation on your phone?
Podcasts that make travel time productive.

What's your go-to lunch spot?
My desk!

What's the best book you've read recently?
Hemingway's *The Sun Also Rises*.

What's your favorite place to go on vacation?
Southern Spain.

If you had to take a year off, what would you do?
Take computer science classes... and drive my kids crazy.

What's the last thing that made you laugh?
My 10-year-old daughter explaining all the reasons we couldn't name our puppy Whiskey.

What's your biggest fear?
Technological singularity.

What's the best advice you've gotten?
You can't change the cards you're dealt, just how you play the hand.

What's the best advice you've given?
Learn something new every day.

If you were 20, what business would you get into?
Biotechnology.

What's your favorite museum or artist?
Jean-Michel Basquiat.

Do you ever expect to retire?
Only after I meet St. Peter.

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NOTE The Notes function—which allows you to capture information you can tag to securities in a living document that can be updated, recalled, and shared with colleagues—now lets you color-code notes to help prioritize your work. Go to {NOTE <GO>}, right-click on a note, and select Apply a Color. The color will be applied to the listing for that note. If it's a shared note, only you will see the color.

DRIV Drivers can help you answer the question "What am I missing?" when analyzing a portfolio, ETF, or list of stocks. Run {ROBO US Equity DRIV <GO>} to analyze the Robo Global Robotics & Automation ETF, for example. DRIV surfaces the characteristics that are most relevant to the ETF, so you can see whether its portfolio tilts are what you expect—or not. In addition, DRIV identifies the characteristics that have backtested as favorable tailwinds or unfavorable headwinds. 80

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Stock Drivers

By JOE WEISENTHAL

DRIV <GO>

FOR INVESTORS around the world, it's been a season of rotation. Profitless growth (*cough*, WeWork, *cough*) is out, while steady, profitable, and cyclical is back in style. "Value" managers, who seek out cheap, moneymaking companies, are having a moment in the sun. The big question is whether this rotation can last. But whether it does or doesn't, investors have to know which drivers of returns they're exposed to. Enter {DRIV <GO>}, a tool for examining the exposure of a portfolio of stocks or even a single name.

For example, if I look at the S&P 500 overall, I can instantly see several tailwinds supporting it. The return on equity of its components is one. And sales surprises have been nicely positive. Meanwhile, negative attributes such as volatility and dispersion of earnings per share estimates look low. It's no wonder that—as I'm writing this—everyone's bullish, with the index near all-time highs. Interestingly, if I look at the S&P 600 (a small-cap index), there aren't nearly as many tailwinds. The index remains well off all-time highs reached in mid-2018. OK, so far, so straightforward.

Where the tool really sings is when you look at the potential in individual stocks. I mentioned the rotation earlier, and one stock that typifies the newfound love for cyclical and profitable is Caterpillar Inc., the maker of big equipment with high exposure to the global economy. After slumping for the past year and a half, its stock has soared since mid-August. Look it up in DRIV, and you'll see numerous headwinds. Sales growth has been mediocre, there's a wide dispersion of estimates, and so forth. Many of the drivers are negative, and in a weird way that explains the surge as investors became more optimistic about global growth. If such signs point to "no," and then the stock suddenly becomes the flavor of the month, the gains can be absolutely vicious as investors pile in.

So DRIV can be invaluable for anticipating which stocks are trading at extremes of pessimism or optimism. If you look at Microsoft Corp., virtually everything is pointing up. That doesn't mean it will fall anytime soon. If you had a bear thesis on it, however, a reversal could be swift. Of course, this is all just scratching the surface, but overall, DRIV is a great tool for seeing what's moving and why. ●

Weisenthal co-hosts *What'd You Miss?* on Bloomberg TV and is news director for the Americas at Bloomberg.

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