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Email and online communication can be the fastest ways to communicate with clients, but they're not always the best ways for financial advisors intent on building long-term relationships, counsels Tim Sanders. A sales consultant and former leadership coach at Yahoo, Tim is the author of the New York Times best seller Love Is the Killer App: How to Win Business and Influence Friends, *and a Hartford Funds Human-Centric Insights panelist.*

Financial advisors and their clients are pressed for time. Email and websites help us do more in less time. But you champion the importance of face-to-face meetings. Why?

In 2004, I started to study the impact of relying on digital technology to communicate, rather than relying on good old-fashioned face-to-face meetings or phone conversations. My research confirmed that if we don't have as much face time, we're often more confused and depressed, and we feel less connected.

What I tell financial advisors is, whenever you can, warm up the channel of communication. The coldest channel of communication is email-to-email. Let's say you send an email to someone saying you have an idea, and they reply to you, "WELL THAT SOUNDS PRETTY DUMB." The email might really make you angry because all you've got to go on is what you see on the screen.

But if that person, sitting through a long lunch with you, said the same thing in the context of a conversation, it's easier for you to accept it. You can understand their intentions through their tone of voice, their body language and the look on their face.

When meeting with clients, how much of it is giving them insights, and how much should be devoted to taking in information that clients provide?

While people take meetings for the promise of insight, the reason they enjoy meetings and feel they're getting a high return on attention is the feeling that they've been heard. My company took a look at the word count in sales situations, and we learned that the average person, such as a financial advisor, will probably talk 60–70 percent of an average meeting. But we found that when your word count is less than half of the conversation, your closing rate doubles. Because the more you listen, the more you learn. The more someone speaks to you, the more they clarify exactly what they really want. And so much of the financial advisor's job is to figure out exactly what the client wants to do with their money.

How can moving beyond just providing financial advice help to build a financial advisor's business?

As you get closer to the end of a meeting, I recommend that you think beyond the core advice and consider the whole of your client. I often ask, "What is your wow project? What are you excited to be working on?" The answer often leads clients to discussing their challenges, and in the course of that, they'll reveal very personal things, such as shaky confidence or conflicts with their family members. But the whole conversation is inherently positive. I find this wow project question leads to a much more personal connection than asking, "What keeps you up at night?" If you can create a positive conversation that connects to someone's passion, they open up to you like a flower. You'll find opportunities to make real, empathetic connections.

> If you can create a positive conversation that connects to someone's passion, they open up to you like a flower.

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To learn more about investor psychology and how financial advisors can better communicate with their clients, go to the Hartford Funds' **HumanCentricInvesting.com**

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Dr. Barbara Nusbaum

Clinical Psychologist, Ph.D., expert and speaker, specializing in the intersection of money, psychology and life

Dr. Nusbaum works with individuals, families and organizations on the impact of the emotional/psychological side of money. She has appeared as an expert for *The New York Times*, *CBS News*, *Forbes*, *The Wall Street Journal*, *Bloomberg*, *Money Magazine* and *Daily Worth*.

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Dr. Archuleta's research relates to the area of financial therapy and includes dyadic processes influencing financial and marital satisfaction.

Dr. Vicki Bogan

Professor and Director of the Institute for Behavioral and Household Finance (IBHF) at Cornell University

The mission of the IBHF is research and education in the areas of behavioral finance and household finance with the goal of better understanding and modeling financial behavior.

Tim Sanders

Author and expert on motivation, emotional talent and sales innovation

Tim is the author of five books including the New York Times bestseller, *Love Is the Killer App: How to Win Business & Influence Friends.* He was the Chief Solutions Officer for Yahoo, as well as their Leadership Coach.

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THE MYTHS OF ETFs

Exchange traded funds (ETFs) have more than $2 trillion in assets under management in the United States.[1] They've been around for 23 years, ever since State Street Global Advisors (SSGA) launched the first SPDR ETF, SPDR® S&P 500® ETF (SPY), in 1993. But some investors are still confused about the key attributes of ETFs, such as their risk profile, suitability, cost and performance. Here are the most common myths and facts that set the record straight.

MYTH #1: ETFs ARE RISKIER THAN MUTUAL FUNDS

With both mutual funds and ETFs, there are two kinds of risk: the risk that your investment will decline in value, and risk tied to a fund's operations. As for investment risk, the performance of the underlying securities determines the fund's risk profile. So, if you have an ETF and a mutual fund that are designed to track the same index, both investments should have similar investment risk.

As for operational risk, ETF liquidity, transparency and tax efficiency compare favorably to those of traditional mutual funds, says Tim Coyne, Head of Global SPDR Capital Markets at SSGA. ETFs are traded throughout the day and priced in real time, while mutual funds are priced once daily at the market close. ETFs disclose their holdings daily, while most mutual funds only disclose their holdings on a quarterly basis. Trading activity can generate additional transaction and tax costs for mutual fund shareholders, while the creation/redemption mechanism of ETFs can reduce these costs.

MYTH #2: ACTIVELY MANAGED ETFs GENERALLY HAVE HIGHER RETURNS THAN PASSIVELY MANAGED ETFs

It all depends on your time horizon. Over certain time periods, passive ETFs have outperformed actively managed ETFs. Over other time periods, the reverse is true.

It is certainly true that actively managed ETFs have become more prominent. "ETFs started out very much as a passive strategy, however, they continue to evolve," says Coyne. "For example, we're seeing a lot of focus on smart beta products in the ETF market, an approach that represents an effective bridge between passive and active management."

Additionally, SSGA has brought to market their own active strategies, as well as partnered with industry leading active managers, to bring active management to the transparent, low cost and more tax efficient ETF wrapper. "Whether clients are looking for passive, smart beta or active solutions, ETFs are increasingly being used as the vehicle of choice by investors of all types," says Coyne.

MYTH #3: WHEN MARKETS ARE EXTREMELY VOLATILE, ETFs OFTEN FAIL TO TRACK THEIR INTRINSIC VALUE

This myth misses the point: ETF pricing is dependant upon accurate market data and liquidity of their underlying securities. When there are market-wide disruptions, equity or fixed income, ETFs may experience temporary deviations from their instrinsic value. However, in some cases, instrinic value itself may be compromised due to lack of real-time market data. That being said, ETFs trade continuously on exchange and, in some cases, can provide price discovery for an asset class. For example, on August 24, 2015, despite market data being unavailable for several of its underlying securities, SPY efficiently traded roughly 507 million shares, or $97 billion, throughout the day at an average premium or discount of 0.0053%.[2]

SSGA continues to work with regulators and other market participants in an effort to prevent similar future pricing disruptions, and to minimize their impact if they do occur. ●

(1) Morningstar and SSGA, as of December 31, 2015.
(2) Bloomberg, NYSE Arca as of 8/31/2016.

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PHOTOGRAPH BY LARRY FINK / COVER ARTWORK BY ROBERTO PARADA

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Robert Jen (“This Model Lets You Track and Forecast China’s Yuan Fixing,” page 42) is an FX market specialist at Bloomberg in Hong Kong. Before joining Bloomberg last year, Jen worked at JPMorgan Chase and UBS. “With lackluster growth, and monetary policy stretched to the limit in developed economies, risk sentiment remains one of the last linchpins of normalcy in financial markets,” Jen says. Go to {.RONROFF Index GP <GO>} to chart a quantitative measure of risk-on, risk-off sentiment, which rose after Donald Trump’s election.

Larry Fink, who’s been a professional photographer for 55 years, shot Vanguard founder Jack Bogle for our cover story, “We’re in the Middle of a Revolution” (page 74). “Jack Bogle is a sweetheart,” Fink says. The photographer’s work has been exhibited in major museums around the world. *Social Graces*, a 1979 one-person show at the Museum of Modern Art in New York, juxtaposed pictures of wealthy New Yorkers partying with photos of Fink’s neighbors in Martins Creek, Pa.

Little is known about the secretive quantitative hedge fund Renaissance Technologies or its claim to fame, an employees-only fund called Medallion that’s made its operators—all of them scientists—wealthy. “Medallion is the blackest box in all of finance,” says reporter **Katherine Burton**, who wrote “Inside a Moneymaking Machine Like No Other” (page 82). “We’ve known so little about either the firm or fund—until now.” Burton is also the author of the book *Hedge Hunters*, which profiles some of the industry’s leading managers.

Based in London, reporter **Kit Chellel** has been writing about law and lawsuits for more than a decade. His article, “In Pursuit of a 10,000% Return” (page 96), explores the increasingly widespread practice of investing in lawsuits. With yields from other assets proving anemic, investors are funding litigation costs in the expectation of making a profit when a legal battle is won. Chellel’s article focuses on a class action against Volkswagen over the carmaker’s 2015 emissions scandal. “Like all investing, litigation funding is essentially a gamble,” he says. “When the bet pays off, the rewards can be enormous.”

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“All the things that worked before won’t work as well going forward.”

Michael Mullaney

DIRECTOR OF GLOBAL MARKET RESEARCH,
BOSTON PARTNERS GLOBAL INVESTORS

"In the U.S., this is an administration which arguably is more of an unknown to investors than any in the last 50 years. And I think that's likely to introduce a level of volatility into the markets as that blank canvas is filled in. That, to me, is the story of 2017 from a markets perspective."

Paul Taubman

CHAIRMAN AND CHIEF EXECUTIVE OFFICER, PJT PARTNERS

"I'm expecting the Trump presidency to be not as much trade-bashing and migration-stopping as had been expected before the elections, which will tend to be dollar-positive. The two emerging markets remaining nervous are the Mexican peso and the Chinese renminbi."

Komal Sri-Kumar

PRESIDENT, SRI-KUMAR GLOBAL STRATEGIES

"Trump's taxation and regulation policies are clearly pro-growth. But the first year of a presidential term is typically not very good."

Scott Minerd

GLOBAL CHIEF INVESTMENT OFFICER, GUGGENHEIM PARTNERS

"It looks like earnings will be improving next year, and that should be enough to support the stock market. Very modest gains. You're going to notice much more the ups and downs rather than a trend in any one particular direction and a lot more volatility."

Jeffrey Kleintop

CHIEF GLOBAL INVESTMENT STRATEGIST, CHARLES SCHWAB

"On Nov. 9, 1989, the Berlin Wall came down and ushered in a generation of growth based on inclusion: free flow of ideas, capital, and people. It also launched the golden age of central banking. The loop closed on Nov. 9, 2016, by building walls and excluding people, capital, and ideas."

Peter Borish

CHIEF STRATEGIST, QUAD GROUP; FOUNDING PARTNER, TUDOR INVESTMENT

“The real risks reside in government debt. Although there has been a modest selloff, there’s still some way to go to achieve realistic pricing.”

Adrian Saville

CHIEF STRATEGIST,
CITADEL & CANNON ASSET MANAGERS

“We think credit, particularly lower-quality credit, will benefit from a pro-growth reflationary environment. Inflation is one way to reduce the real value of the debt of highly indebted companies and thereby improve the quality—or decrease the riskiness—of that credit.”

Ashwin Bulchandani

PARTNER AND CHIEF RISK OFFICER,
MATLINPATTERSON GLOBAL ADVISERS

“The market is biased toward a much weaker U.K. currency and growth. We think the U.K. can significantly surprise to the upside, given the poor sentiment and the potential for pass-through effects from the weak currency and the fiscal impulses that the new government will deliver.”

Ben Melkman

FOUNDER,
LIGHT SKY MACRO

“Ironically, a number of countries in Latin America have turned away from failed experiments with populism in favor of more orthodox policies.”

Michael Hasenstab

EXECUTIVE VICE PRESIDENT AND CHIEF INVESTMENT OFFICER,
FRANKLIN TEMPLETON

Reporting by Sonali Basak, James Crombie, John Gittelsohn, Colin McClelland, Hema Parmar, Katia Porzecanski, Charles Stein, and Miles Weiss

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The Bond Vigilantes Ride Again

By LIZ CAPO MCCORMICK and ANCHALEE WORRACHATE

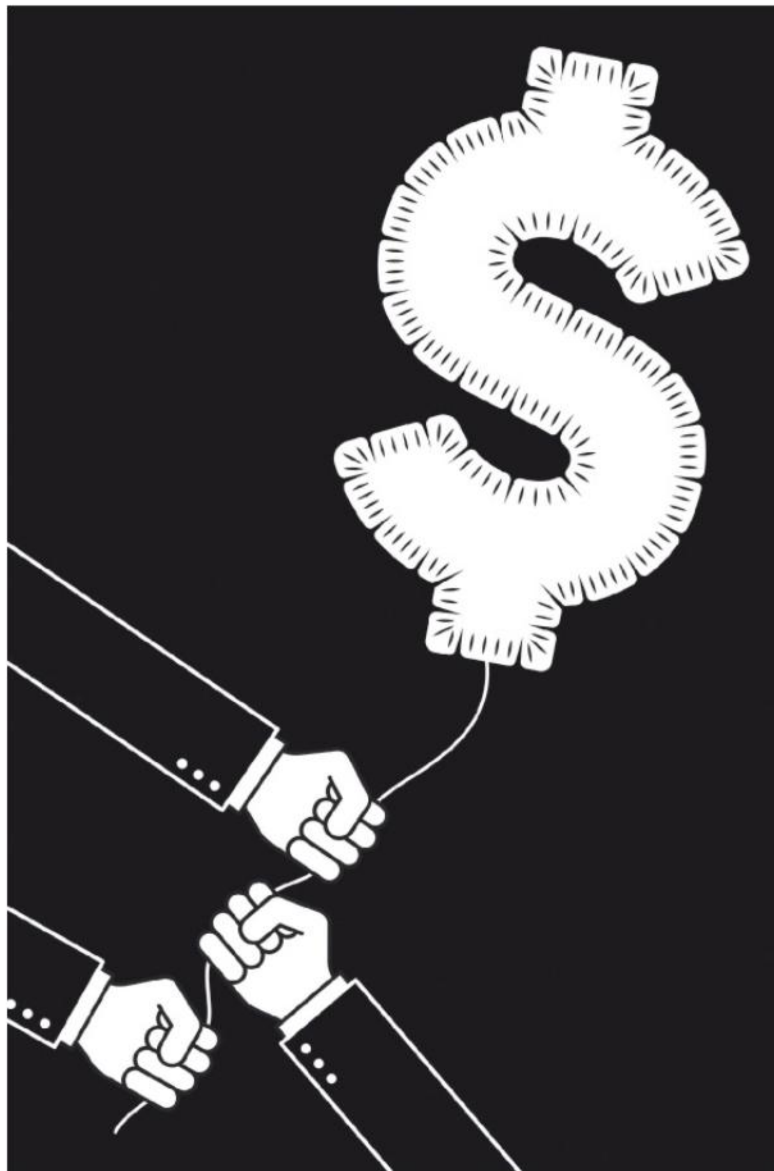
ILLUSTRATION BY MATT CHASE

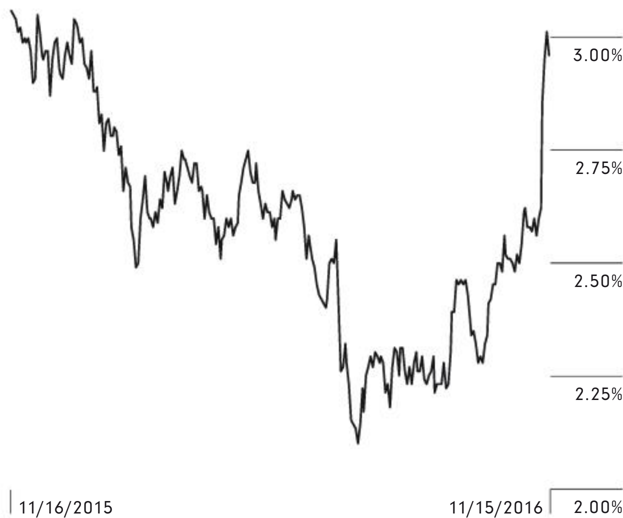
WHEN IT COMES to Donald Trump's plan to "make America great again," the bond market is sending the president-elect a simple and unambiguous warning: Be careful, or it's going to cost you.

In the days after the billionaire Republican candidate scored a stunning electoral victory with a mix of inflammatory populist rhetoric and promises to cut taxes, curb immigration, and spend big on infrastructure, America's financing costs soared in ways that few expected. Yields on U.S. Treasuries jumped, contributing to the biggest increase since the "taper tantrum" earlier this year.

Part of it, of course, had to do with expectations that Trump's fiscally expansive, pro-growth agenda would spur faster inflation. But crucially, it served as a not-so-subtle reminder that America's creditors can still wield considerable power to constrain public spending and force the incoming administration to make hard choices about the proposals it can and cannot afford. "Bond vigilantes," after all, famously compelled President Bill Clinton to scale back an ambitious domestic agenda—including a middle-class tax cut—during his first term to focus on deficit reduction instead.

"Trump has all these big ►





Source: {USGG30YR Index GP <GO>}

spending plans, but he doesn't have the revenue to pay for it," says John Bredemus, a money manager at Allianz Investment Management, which oversees more than $700 billion. "As rates go up, funding costs go up and deficits get worse. The reality will kick in at some point that you just can't get a lot of this stuff done."

The details haven't all been fleshed out, but as part of his plan to jump-start the U.S. economy, Trump has pledged to reduce personal taxes across the board, to lower corporate taxes to 15 percent from 35 percent, and to spend $1 trillion rebuilding and improving the nation's crumbling infrastructure. Some costs would be offset by a one-time repatriation tax of 10 percent for companies, which hold about $2.6 trillion abroad. (Judy Shelton, an economic adviser to Trump, declined to comment.)

Trump has also promised to build an impenetrable wall along the U.S. border with Mexico to keep out undocumented, low-wage workers and to replace portions of President Obama's signature health-care law.

So far, no one is suggesting Trump will face the same degree of pushback from the bond market that Clinton confronted in 1994—when worries about profligate spending sent 10-year yields past 8 percent—because borrowing costs are so low and foreign demand for U.S. debt has been so high.

But the situation might be starting to change. In the two days after the Nov. 8 election, 10-year yields rose 0.3 percentage point, reaching 2.15 percent. For the week, the jump was the largest since June 2013. Hardly anyone on Wall Street saw it coming. None of the 65 analysts surveyed by Bloomberg in October said yields would rise above 2 percent by yearend.

Worries that a surge of spending under Trump will widen the budget deficit and lead to faster inflation have already prompted some investors to step back from Treasuries. On the day following his victory, demand at the government's sale of $23 billion of 10-year notes fell to the lowest since 2009. "More fiscal policy would possibly also cause more issuance, which is impacting markets," says Michiel de Bruin, the London-based head of global rates at BMO Global Asset Management, which oversees more than $238 billion.

A sustained retreat, especially by foreign investors, who've been the biggest source of demand in the Treasury market, could potentially undermine Trump's spending plans before ►

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TYPE VETF <GO>

he even takes office. The U.S. has benefited in recent years from foreign buyers of its debt, with the Treasury market having swelled to $13.8 trillion since the financial crisis. According to Treasury Department data, the largest foreign holder of U.S. debt as of Aug. 31 was China, with $1.34 trillion. (This includes $157 billion China holds through Belgium, which is viewed as home to Chinese custodial accounts.) The second-largest is Japan, with $1.14 trillion. Domestic investors ranking as the U.S.'s biggest creditors include Vanguard Group and Fidelity Investments.

According to estimates from the Committee for a Responsible Federal Budget, Trump's economic proposals would result in $5.3 trillion of borrowing and push America's debt burden in 10 years to 105 percent of its gross domestic product, from 77 percent now. On Nov. 9, Fitch Ratings warned that Trump's fiscal policies would be a negative for America's creditworthiness.

And that's not counting the extra $10 trillion of debt that the Congressional Budget Office says the government will need to cover the rising cost of programs like Social Security and Medicare over the next decade. Net annual interest costs alone are expected to almost triple by 2026, according to the CBO. "We suggest that investors diversify away from fixed income if they can," says Massimiliano Castelli, head of global strategy at UBS Asset Management, which oversees about $660 billion. "The bond bull run which has lasted for more than two decades will have to come to an end at one point, but the victory of Trump probably brings this on earlier than previously thought."

Those who are buying have responded by demanding more compensation to own longer-term Treasuries. The 10-year term premium, a measure that prices in unexpected risks as well as changes in perceived demand relative to future debt supply, surged a week after the election to become positive for the first time since early this year.

DoubleLine Capital's Jeffrey Gundlach, who predicted in October that Trump would win, said on Election Day that he wouldn't be surprised if 10-year yields are at 6 percent in four or five years as inflation outpaces economic growth.

Some investors doubt that the threat of higher borrowing costs will deter Trump's ambitions. As a businessman, he often used high-cost debt to fuel expansion at his casinos and hotels, even as some projects involved bond defaults and others ended in bankruptcy. In May, Trump said, if the economy were in a prolonged slump, he might use his business skills to push America's creditors to accept writedowns on their government debt.

"Trump is going to do whatever he sees fit and not give too much attention or concern about the bond market," says Stephen Jen, the chief executive officer of Eurizon SLJ Capital and a former International Monetary Fund economist.

Nevertheless, Rick Rieder, chief investment officer of global fixed income at BlackRock, which oversees $5.1 trillion, sees a rare window of opportunity to put much of Trump's agenda in place without having the U.S. taxpayer bear all the costs, which could avert a potential backlash among bond investors. Public-private partnerships, combined with historically low funding costs, a Republican-controlled Congress, and demand for infrastructure-secured financing, will all work in Trump's favor.

"The window to do it right, I would argue, has never been greater," Rieder says. "The fact that you now have a totally Republican Congress means you'll actually be able to get fiscal policy through."

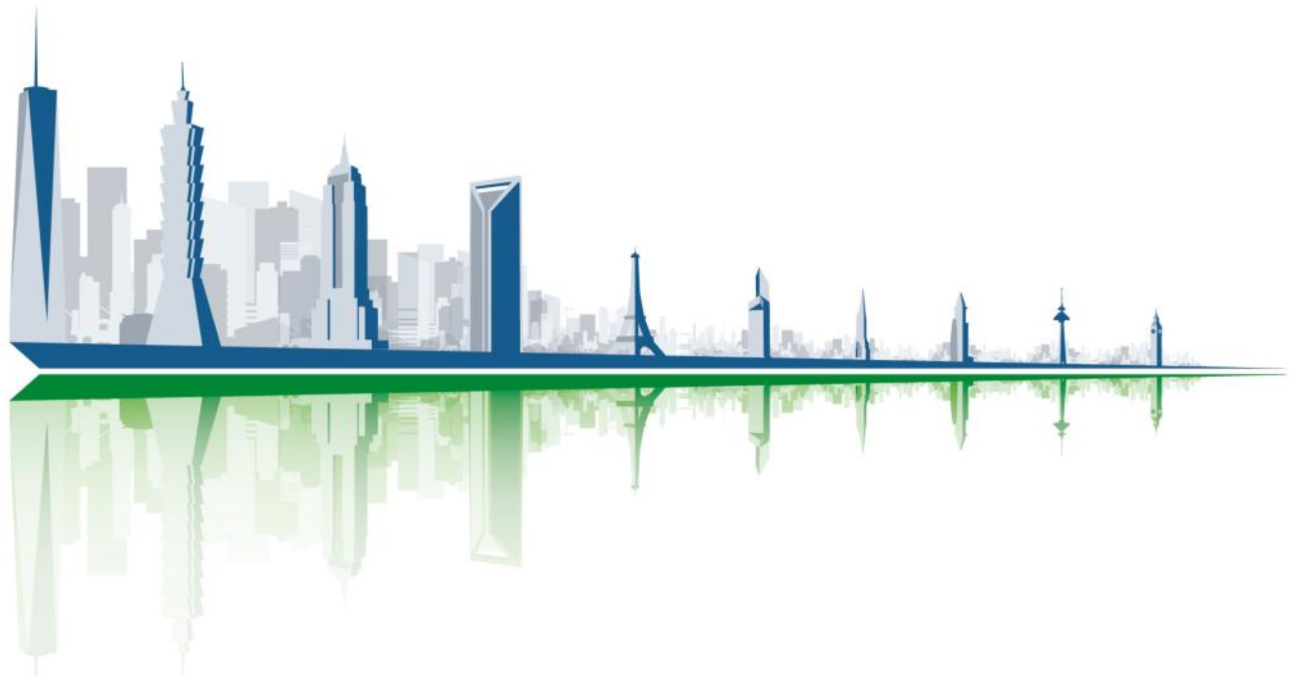
Even if investors give Trump the green light, fiscal conservatives in his own party might not. Led by the Tea Party faction, congressional Republicans have clashed numerous times with Obama over spending priorities and the doubling of the national debt under his administration's watch. But now, more debt-financed spending is what Trump and his advisers are advocating to spur the economy. In October, Trump claimed his plan would unleash growth of 5 percent or 6 percent—about double today's pace. "Business people like Mr. Trump understand you can grow yourself out of excessive debt," Trump economic adviser Anthony Scaramucci wrote in an opinion piece in the *Financial Times* on Nov. 12.

Whatever the case, keeping the bond market on board will be key. In recent years, the global savings glut and rock-bottom rates helped keep Treasuries in demand. But any misstep could be disastrous. Given market conditions in mid-November, a 1 percentage point rise in yields would lead to more than $400 billion in losses, which might cause investors to push borrowing costs even higher.

And that could have lasting consequences for Trump, thwarting his promise to get America back on track.

Remember, says Mark Zandi, chief economist at Moody's Analytics, "Clinton also had grand plans, and the bond vigilantes beat them back." ● *—With John Gittelsohn, Eliza Ronalds-Hannon, and Wes Goodman*

McCormick and Worrachate cover fixed income for Bloomberg News.



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Power Play

DON'T LOOK DOWN, buddy—these things are huge! The five generators at the U.S.'s first offshore wind farm perch 360 feet above the surface of the Atlantic Ocean. (They need to be that high so the 240-foot-long blades they're attached to have enough room to turn without taking out any passing pleasure craft.) In strong winds, the rotors can make as many as 11.5 revolutions per minute—which means the blade tips will be moving at about 200 miles per hour.

Block Island Wind Farm, located 3 miles south of the Rhode Island vacation spot and developed by Providence-based Deepwater Wind, was slated to start pumping out electricity at the end of November. When it does, its 30-megawatt capacity will be enough to power 17,000 homes.

Meanwhile, in November, the stock prices of wind and other renewable energy companies fell the most in six months after the election of Donald Trump, who has vowed to lift regulations on fossil fuels. For Bloomberg Intelligence analysis on how the Trump administration may affect wind companies, run **{BI WIND <GO>}**, and for research from Bloomberg New Energy Finance, go to **{BNEF <GO>}**.
—*Jon Asmundsson*

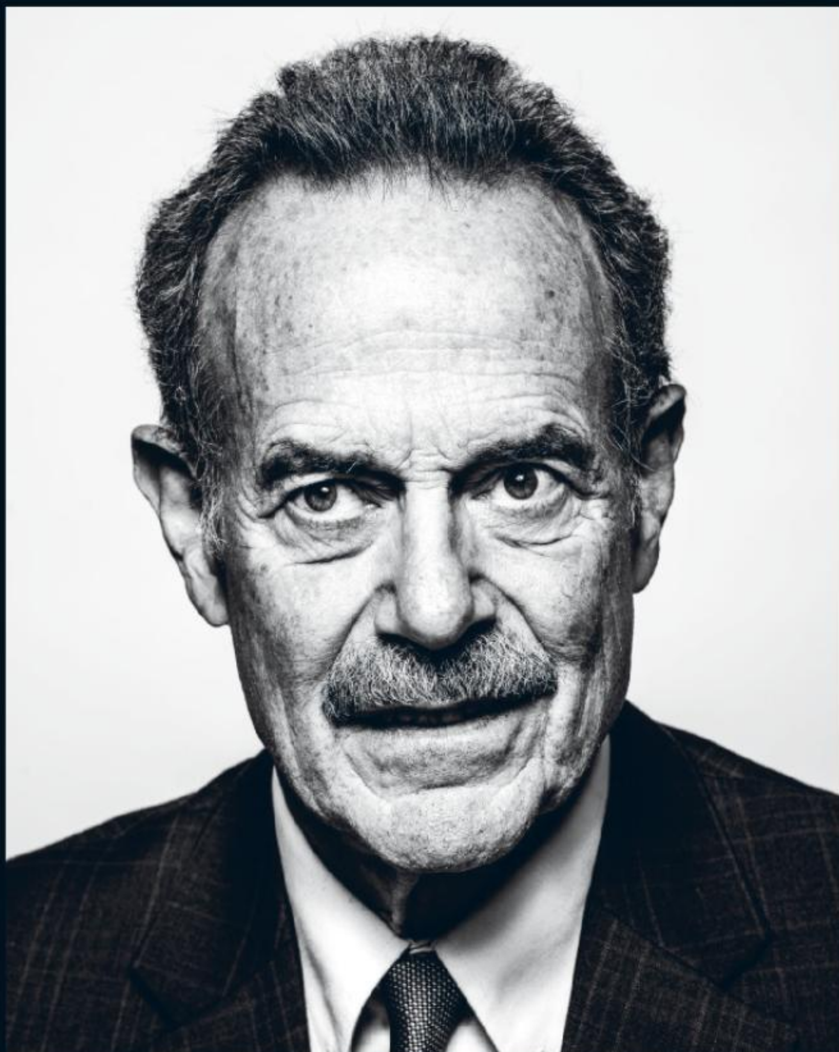
PHOTOGRAPH BY
GEORGE STEINMETZ

Fixed Income

This Activist Built One of the Foundations Of Passive Investing

By BRIAN CHAPPATTA

PHOTOGRAPH BY MICHAEL FRIBERG



ART LIPSON COULDN'T have picked two more distinct ways to shake up the bond market.

Back in 1973, Lipson first made a name for himself by creating the bond index that grew into the Lehman Brothers Family of Indices. Now the Bloomberg Barclays Indices, they're the benchmarks for many of the world's largest fixed-income mutual funds. Among the funds that track them are those of Vanguard Group, the pioneer of low-cost indexing as an alternative to higher-fee active strategies.

These days, Lipson also targets fund management costs—and entrenched managers—from his perch at Western Investment, the Salt Lake City-based hedge fund he founded in 1997. As an activist investor, he's crusaded against certain closed-end funds that he thinks ignore shareholders' interests in favor of raking in fees. "They violate their fiduciary responsibility to shareholders on a continuing basis," says Lipson, 73. "I realized I could get these fund companies to respond quickly if I challenge them and keep their feet to the fire, showing they could get voted out if shareholders are unhappy."

CLOSED-END FUNDS, according to Lipson, are an "obscure little backwater" of the global financial markets. There were 563 closed-end funds in the U.S., overseeing a total of $251 billion in assets, as of Nov. 10, according to data compiled by Bloomberg. The funds raise money by selling a fixed number of shares in a public offering and then use the proceeds to invest in bonds, stocks, or other assets. Since closed-end funds trade like stocks, their share prices can diverge from the per-share value of their assets.

When investor demand wanes, a fund's shares can trade at a significant discount to net asset value. In theory, an investor could swoop in when that happens, buy up all of the fund's shares, liquidate its assets, and collect the difference as profit.

Managers running closed-end funds that trade at steep discounts can use the opportunity to buy back some shares on the cheap. Selling some assets and buying back stock at a 15 percent discount, for example, could increase the net asset value of the remaining shares by a proportional amount. Doing that, in turn, could help bring the share price more in line with NAV.

Sometimes, though, fund companies try to avoid such remedies because they curb adviser fees. And that's where Lipson's strategy—which he will only say has netted double-digit average annual returns over the past two decades—comes into play.

Since 2004, when he started his activism, he's fought with closed-end funds about 40 times, prodding them to repurchase shares or liquidate themselves or turn open-ended so investors can exit at a better price.

In his latest tussle, Lipson in August nominated himself and three other dissident directors to replace four members of the boards of two Deutsche Bank funds: Deutsche Multi-Market Income Trust and Deutsche Strategic Income Trust. He's also seeking shareholder support to elect all directors annually, instead of in the funds' existing staggered votes for three-year terms. "I tell all these companies I'm not going to do activism unless I can buy shares at a double-digit discount," Lipson says. "And they know that. But they're just so penny foolish. They let them go to big discounts, and they sit there in their fancy boardrooms rather than doing the right thing for shareholders."

Oksana Poltavets, a spokeswoman for Deutsche Bank in New York, declined to comment.

LIPSON HAS SOME company in closed-end fund activism. Saba Capital Management, which has plowed more than $800 million into closed-end funds in recent years, earlier this year battled with Deutsche High Income Trust. Bulldog Investors is another activist in the space.

For their part, nonactivist investors in closed-end funds tend to keep an eye on moves by the activists. "If we see Bulldog or someone like them getting some traction, we may pile in and help them get over the finish line," says James Robinson, founder and chief executive officer of Robinson Capital Management, a Grosse Pointe Farms, Mich.-based firm that oversees $500 million.

Robinson runs open-end funds that invest in closed-end funds. He mostly stays away from the type of companies Lipson and other activists target, though. "Our experience for the most part is the runway is extremely long and the payoff is suspect," he says. "We tend to focus more on the large companies that have good governance in place. They're more focused on these smaller entities."

CLOSED-END FUNDS may be a relative backwater these days, but so was the bond market in the 1970s. In fact, Lipson says he shifted to fixed income at investment bank Kuhn Loeb simply because he didn't want to deal with the hordes in equities. "I've always looked at underserved areas of the market," he says. "The disadvantage is you have to do all the grunt labor yourself because there's no existing databases or reference materials. The advantage is if you're right, you don't have competition."

Lipson leveraged his background as a computer programmer—then a relatively rare skill—into fixed-income research. His firm raced bond king Salomon Brothers to create a comprehensive index for the U.S. bond market. When Lehman Brothers acquired ►

Go to **{<u>INDE <GO></u>}** for an overview of Bloomberg indexes.

This year the Bloomberg Barclays Global Aggregate Index gained 7 percent through Nov. 8.

Kuhn Loeb in 1977, Lipson's research effort came along as part of the deal. As Lipson tells it, his index won out because he gave away his data for nothing. By contrast, Salomon Brothers wanted to protect its methodology and charge for it.

After Lehman Brothers fell during the financial crisis, Barclays, which bought the bankrupt New York-based firm's investment banking business and other assets for $1.75 billion, had the benchmarks land in its lap.

Jack Malvey, who was Lehman's chief global fixed-income strategist up through the firm's demise, says he and his Lehman colleagues had fielded inquiries about selling the indexes for years. None became too serious, until the crisis forced their hands. "Barclays got a deal that was a tremendous home run," Malvey says. "They didn't have time to do any due diligence; it was basically part of the furniture of Lehman Brothers."

NOW MUTUAL FUNDS overseeing about $2.8 trillion of bonds—roughly 80 percent of assets in the fund category—benchmark themselves to various offshoots of Lipson's creation, according to Morningstar. The Bloomberg Barclays U.S. Aggregate Index, in particular, is the most widely followed measure of fixed-income performance worldwide.

In December 2015, Barclays agreed to sell the indexes and related analytics to Bloomberg LP. The transaction was completed in August. (Bloomberg LP is the parent of *Bloomberg Markets* magazine.)

LIPSON FINDS IT ironic that his index ended up in the hands of Bloomberg, because it was the advent of the eponymous terminals that hastened his exit from Wall Street. The computer background that gave him a leg up in creating the index was no longer ahead of the pack.

Lipson says he's happy to have fled the Wall Street life, however, and insists there will always be a niche for his activist strategy. "I don't know if it's stupidity or greed or whatever, but the fund companies don't respond—they just keep doing the same thing," he says.

As for his index—the benchmark for the $100 trillion global bond market—Lipson doesn't need to track it much for his day-to-day work. But he still keeps an eye on it. "I kind of have a long-term parental interest," he says. "My child has gotten married and divorced several times since then, but I definitely follow it." ●

Chappatta covers government bonds at Bloomberg News in New York.

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Bonds

Seeking Protection From Rising Rates? Here's A Strategy for That

By STEVEN GEE

Go to {FIW <GO>} to drill down in a list of bonds to those that meet the criteria you specify.

BOND MARKETS ARE anticipating a move by the Fed.

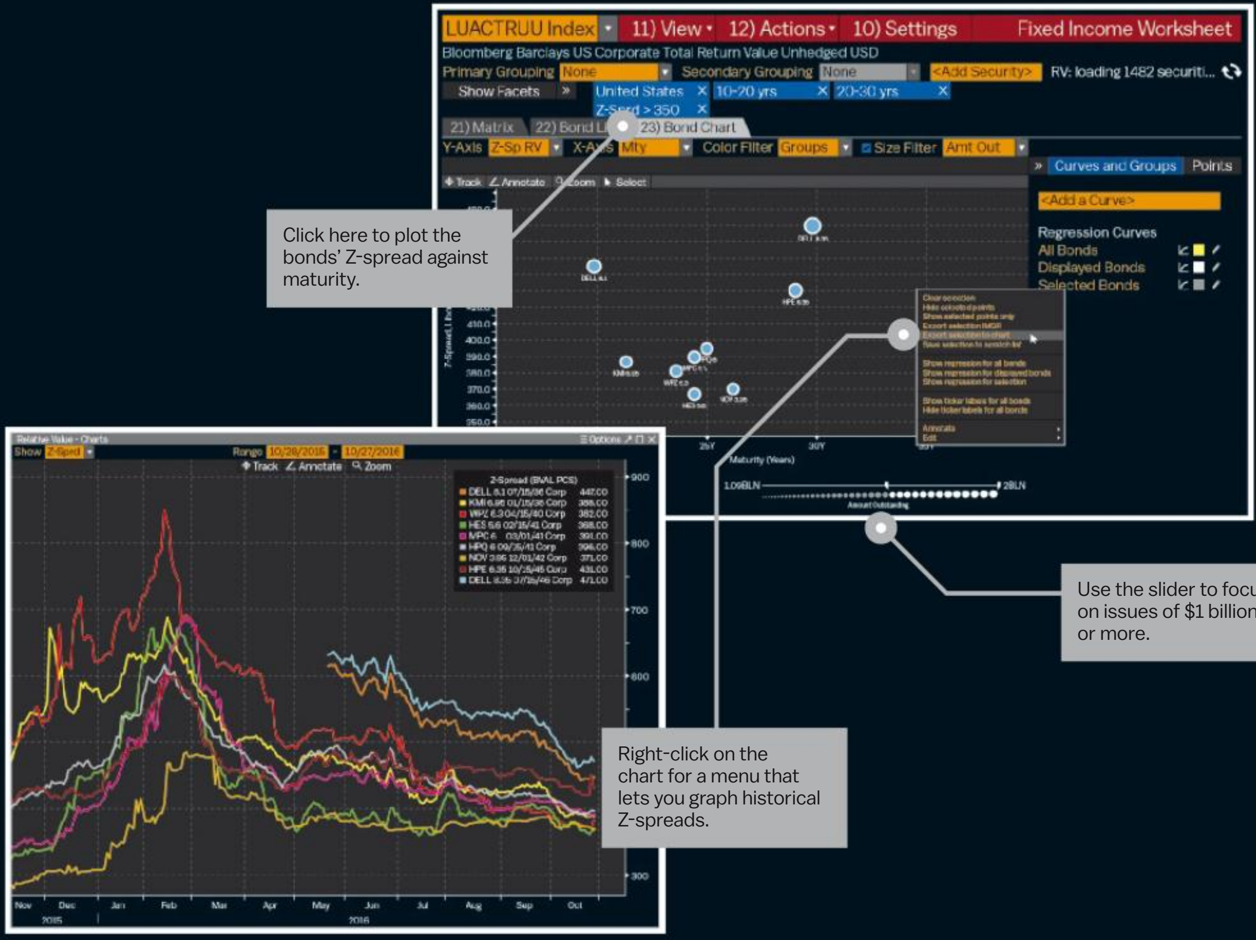
In late September, the futures-implied probability that the Federal Open Market Committee would increase rates at its December meeting rose above 50 percent, according to the World Interest Rate Probability (WIRP) function. During October, Treasuries fell. Yields on benchmark 10-year notes rose about 25 basis points. Thirty-year bonds widened by a similar amount.

The prospect of rising rates in the U.S. threatens one of the best-performing slices of the bond world: high-grade corporate bonds, which racked up a total return of almost 9 percent this year through Oct. 24. Now those bonds may be at risk of giving up some of their gains, according to Rich Salditt, a fixed-income strategist for Bloomberg Intelligence. In an Oct. 12 piece on the BI Credit Strategy dashboard, Salditt said the Trace Market Flow (TFLO) function showed dealers buying long-duration corporate bonds that investors didn't want and that the Exchange-Traded Funds (ETF) function showed outflows from long-bond ETFs and inflows into shorter-maturity funds. For BI's credit strategy analysis, go to **{BI STRTN <GO>}**.

IN AN ENVIRONMENT of rising rates, one simple strategy for protecting your portfolio is to over- or underweight bonds based on maturity. To perform relative value analysis and identify bonds for such a strategy, you can use the Fixed Income Worksheet (FIW) function.

If your portfolio is measured against a Bloomberg Barclays benchmark, you can start by going to **{IN <GO>}**. Right-click on U.S. Corporate, for example, for a menu of analytics you can use to dig into the Bloomberg Barclays U.S. Corporate Bond Index. For more information on the indexes and related research from Bloomberg Intelligence, run **{INP <GO>}** for the Index Insights and Publications page.

Next, go to **{FIW <GO>}** for the Fixed Income

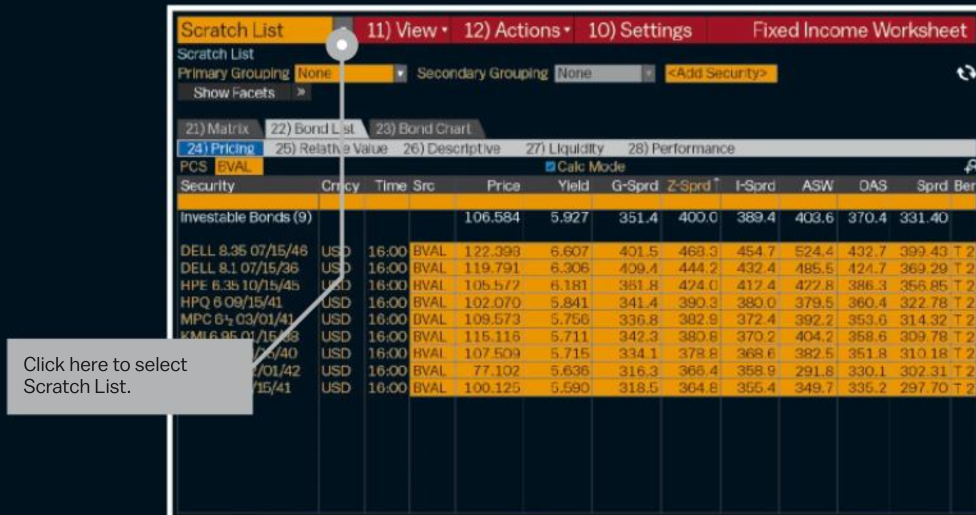


Worksheet. By default, if you're based in the U.S., FIW will open loaded with the Bloomberg Barclays US Aggregate Bond Index (LBUSTRUU), a broad-based flagship benchmark. To switch to the U.S. Corporate index, click on the arrow next to the amber field in the upper left corner of the screen and select (LUACTRUU). If you don't see the U.S. Corporate index in the drop-down menu, click on [More lists ...]. In the Select List window that appears, click on Fixed Income Index. Then, in the <Search> field, enter "US Corporate" and click on the LUACTRUU Index item in the list of matches. To make sure the benchmark appears in the FIW drop-down menu, click on the star next to its name so it turns white. To set the index as your default, right-click on its name and select Set as Default. (As your default for FIW, you can set your portfolio, a RUNZ workbook, or another list of bonds.) Click on the Select button.

As of Oct. 27, the U.S. Corporate index included a total of 5,893 bonds. Let's whittle that down to look at the index's longer-maturity instruments. If the sidebar that lets you filter isn't displayed on the left side of the screen, click on Show Facets. Here are the criteria you can use: First, select United States as Country of Risk. Next, under Curve Buckets, select 10-20 yrs and 20-30 yrs. To compare the bonds' ratings and durations, select Moody's Rating as the Primary Grouping and Duration as the Secondary Grouping. The criteria you selected, shown in blue above the table, trimmed the list to 1,482 bonds. For more viewable screen area, click on Hide Facets.

To view price, yield, and spread information for the list of bonds, click on the Bond List tab and then on the Pricing subtab. You can edit the data shown in the Pricing view. For example, if you don't have a column showing Z-spread, click on the View button on the red tool bar and select Edit Current View. In the amber field under Fields, enter "Z" and press <GO>. Select YAS Z-Spread, click on the Add button, and move the item to where you want it in your ►

Once you've identified the bonds you're interested in, you can use the Scratch List feature in the Fixed Income Worksheet to explore pricing.



display. Save, or choose Save As as a new view, and press Menu to return.

To select bonds that may be affected by rate moves, you can start by looking for those that trade noticeably wider than the average for your list. The average Z-spread—a measure of perceived risk that calculates the bond's constant spread over the benchmark zero-coupon swap curve—was 233.1 basis points among the 1,482 bonds. To identify bonds with Z-spreads of more than 350 basis points, type ">350" into the amber field below Z-Sprd. That trimmed the list to 86 investable bonds. Notice that the Z-spread criterion is also highlighted in blue now.

As a starting point, this list may include target bonds that you decide to underweight in a rising-rate environment.

To analyze the relative performance of the bonds, click on Relative Value. The subtab lets you compare current spreads with their range over a specified period such as six months. In the Range column, when a blue dot is located to the right of the red diamond, it indicates that the current Z-spread is wider than the 6-month average.

You can make side-by-side comparisons by clicking on the gray graphing icons for the bonds that interest you. Similarly, clicking on the gray "i" buttons lets you see descriptive information, including summary covenants and capital structure.

To graph relative Z-spreads, click on the Bond Chart tab. To display bonds' ticker symbols or add regression lines, right-click on the chart and select from the menu that appears. To select bonds that show up in a certain part of the chart for further analysis, click on the Select button at the top of the chart and choose Marquee or Lasso. To further refine the search to issues of $1 billion or more, use the slider at the bottom of the screen. Doing that as of Oct. 27 trimmed the list to nine bonds.

TO EXAMINE THOSE bonds, right-click on the chart and select Save Selection to Scratch List. Next, click on the arrow to the right of LUACTRUU Index in the upper left corner of the screen and select Scratch List. Select Calc Mode, and you can transform the list into an interactive pricing sheet, essentially harnessing the power of multiple Yield and Analysis (YAS) panels on one sheet. Similar to YAS, modifying any bond's field such as spread will adjust yield and price so you can perform deeper analyses by changing pricing assumptions on your bond list and comparing the pricing impact on a side-by-side basis.

You can use a similar analytical methodology to explore overweighting selected shorter-term index bonds that offer attractive relative yield. Trading based on that strategy could help shorten your portfolio's duration. ●

Gee is a credit market specialist at Bloomberg in New York.

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Collaboration

Your Workflow Just Got A Seriously Awesome Upgrade

By MARC KATCHAY

HOW DO YOU capture information and share it with colleagues? Is there a way to make that workflow more effective and efficient?

If you're a portfolio manager, you may need to keep track of trade ideas and commentary. A banker on a capital markets desk might have to capture her reaction to a specific market event that could affect the pricing of a deal. An analyst on a credit research team may want to make sure his commentary is easily accessible to the firm's sales and trading teams.

No matter what your role or exact needs are, **{NOTE <GO>}** enables you to capture ideas and information on the Bloomberg terminal, tag them, and share with colleagues and clients. The function integrates this information directly into your firm's workflow. Whether you're at your desk or on your mobile device while on the road, the functionality makes it simple to create notes and see new information shared by colleagues.

CREATING A NOTE is easy: You can do it with one click from any Bloomberg panel. Let's say you're looking at **{GMM <GO>}**. It's late afternoon in New York on Oct. 11, and you see that the South Korean won is down 1.51 percent on the day. To flag that information, simply click on the Capture Screen icon in the upper-right corner of the panel and select Create Note. The note will be tagged to whatever security you have loaded.

Alternatively, you can simply snip a picture of a screen—part of a **{GP <GO>}** chart showing a move in shares of Samsung Electronics, say—and attach it to a note. To do that, click on the Capture Screen icon and select Snip Any Screen Area and then Attach to New Note.

In your new note, enter a title. You can add tags in the "Enter tags…" field. Just enter the name of a company or person and click on the match. You can also create a custom tag such as "Brexit" to make it easy to organize and identify related notes to align with your workflow. Then in the body of the note, you can compose using rich text, grab additional screen shots, enter tables of data, and so forth. Once you're done, just close the note and it'll be autosaved so you can access it later. (Of course, you can also click on Save when you're done.)

You can also create a note from an IB chat to save a record of your conversation. Just click on the Chat Room Actions icon and select Create NOTE of Transcript. If you're looking at a message in MSG, you can create a note from it by simply clicking on the Note icon to the right of the message header.

Once you've created notes or had them shared with you, you can see them by running **{NOTE <GO>}**. The functionality also lets you save your corporate or external e-mails directly as notes. For more on how to set that up, go to **{NSN ODVA9R6VDKHX <GO>}**. Once you've followed the one-time validation process, simply use the address me@notes.bloomberg.net to send content into **{NOTE <GO>}**.

If you've tagged notes to a security, you can compare them to its performance by running **{GP NOTE <GO>}**.

You can create a note to share with colleagues from any Bloomberg terminal screen.

Run **{GP NOTE <GO>}** to chart notes against the performance of a selected security.

The flag icon here indicates that you have notes related to the loaded security. When the field displays yellow, it indicates that a new note has been shared with you.

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To create a community, run **{CMTY <GO>}** and add the colleagues and clients you want. Once you've created it, you can set the community as your default group so that any note you create can be shared with those contacts. Go to **{NOTE <GO>}**, click on the Settings button on the red toolbar, and use the drop-down menu next to Share All Notes With to select a community. Then click on Update.

Collaboration is more important than ever. **{NOTE <GO>}** lets you efficiently share information in the Bloomberg Professional service environment, which is secure and provides archiving and search via compliance tools to support your regulatory requirements. ●

Katchay is a product manager for contact management and collaboration at Bloomberg in New York.

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FX

This Model Lets You Track and Forecast China's Yuan Fixing

By ROBERT JEN

BACK IN MAY, the People's Bank of China (PBOC) published a monetary policy report on its website. Among other things, the report gave a detailed explanation of the bank's methodology for setting its daily yuan fixing.

The fixing is based on quote contributions from the 14 banks that conduct the majority of trades in the yuan market. One, Beijing-based China Citic Bank, revealed additional details about the methodology after the PBOC's report came out, according to a May 30 Bloomberg report. Given the information that's publicly available, it's now possible to construct a forecasting model for the daily fixing.

Background

Each morning at 9:15 Beijing time, the China Foreign Exchange Trade System, a unit of the PBOC, publishes a fixing of the yuan-U.S. dollar rate. Run {**CNYMUSD Index GP <GO>**} for a chart showing how the fixing has evolved over the past year.

After the August 2015 devaluation of the yuan, the fixing started to correlate more highly with the previous day's official closing price. That was significantly different from previous periods when such correlation was negligible. The implication: After the August 2015 FX move—which in Mandarin was called *huigai*, meaning exchange rate regime change—the PBOC was allowing market forces to play a greater role in setting the fixing. To chart the official close, run {**CFECCNY Index GP <GO>**}.

If you graph the difference between each day's fixing and the previous day's close, a couple of things become apparent. First, from August through December 2015, the fixing deviated by only about 80 pips, or 0.008 of a yuan. Starting in February, the deviation widened, to a range of about 200 pips, reflecting the after-hours trading that went into effect at the beginning of the year. During both periods, the fixing oscillated around the previous day's close.

The market information that flows into the fixing comes from both the previous day's close and contributions from the 14 banks. That seems straightforward enough.

There's one significant complication, however: China doesn't want to gauge the strength of the yuan against only the U.S. dollar. It prefers to measure against a basket of currencies. That desire was reflected in the PBOC's unveiling in December 2015 of the CFETS RMB Index. Run {**CNYRINDX Index GP <GO>**} to graph the index, which measures the performance of the yuan against a basket of 13 currencies, weighted mostly by trade. While the official data are available only once a week, the formula for this data series has been accurately replicated on the terminal and can be used to generate daily or even real-time values. The contributions from the 14 banks are calculations of exchange rates that essentially hold stable the weights of the currencies in the CFETS RMB Index, as well as in two other baskets, a Bank for International Settlements (BIS) exchange rate

To chart the evolution of the yuan fixing since the August 2015 devaluation, run **{CNYMUSD Index GP <GO>}**.

To see the formula for the CNY fixing model, run **{.TODFIX13 Index CIXU <GO>}**.

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Ticker .TODFIX13 Index Name Same-day cny fixing forecast CIX Price Snapshot 6.6724

Use +,-,*,/ as operators. ? for field picker. ! to nest a CIX.

```
CFECCNY Index + (((CNYMUSD Index ** 0.264 * CNYMEUR Index ** 0.2139 * CNYMJPY Index ** 0.1468 * CNYMHKD Index **
0.0655 * CNYMGBP Index ** 0.0386 * CNYMAUD Index ** 0.0627 * CNYMNZD Index ** 0.0065 * CNYMSGD Index ** 0.0382 *
CNYMCHF Index ** 0.0151 * CNYMCAD Index ** 0.0253 * (1 / CNYMMYR Index) ** 0.0467 * (1 / CNYMRUB Index) ** 0.0436 *
(1 / CNYMTHB Index) ** 0.0333) * (1 / EUR T093 Curncy) ** 0.2139 * (JPY T093 Curncy / 100) ** 0.1468 * (HKD T093 Curncy)
** 0.0655 * (1 / GBP T093 Curncy) ** 0.0386 * (1 / AUD T093 Curncy) ** 0.0627 * (1 / NZD T093 Curncy) ** 0.0065 * (SGD
T093 Curncy) ** 0.0382 * (CHF T093 Curncy) ** 0.0151 * (CAD T093 Curncy) ** 0.0253 * (MYR T093 Curncy) ** 0.0467 *
(RUB T093 Curncy) ** 0.0436 * (THB T093 Curncy) ** 0.0333) - CNYMUSD Index) * 0.7
```

Examples

The mean of the price of Google and Yahoo

(GOOG US Equity + YHOO US Equity) / 2

ASKPRC[VOD LN Equity] - BIDPRC[VOD LN Equity]

Log Base e of the yield of a 10 year bond

2.30258509 * LOG(YIELD[CT10 Govt])

Preview Chart 11/11/15 - 10/03/16

index and the International Monetary Fund's special drawing rights (SDR) basket.

The Model

The forecasting model, therefore, which calculates the daily theoretical yuan fixing value and is based on the replicated CFETS RMB Index formula, pulls in a lot of data on market rates and weights to reflect the PBOC methodology. Plugged into the Custom Index Editor (CIXU) function, the formula runs across seven lines. Run **{.TODFIX13 Index CIXU <GO>}** to view the formula, which you can copy, save, and modify.

Here are some of the assumptions we used to construct the model:

- Only the CFETS RMB Index is taken into account. The BIS and SDR indexes are ignored.
- The CFETS index value remains unchanged from the previous day.
- The 4:30 p.m. official closing USDCNY rate from the previous day is used as a base.
- The change in the daily fixing equals the CFETS index's 13 component currencies' moves from the previous day's fixing level to 8:30 a.m. today.

▶

Since a turbulent period at the beginning of the year, the model has tracked the official fixing closely.

- An assumed scaling factor of 0.7 is applied to this daily change to arrive at a delta.
- The USDCNY fixing today is yesterday's 4:30 p.m. official closing, plus the delta.

Despite the unprecedented clarity from the PBOC, several sources of uncertainty remain. Among them: The relative weighting of each RMB index and of each component currency in the indexes isn't specified. The exact time that data is used is uncertain. The scaling factor hasn't been revealed. It's also not clear exactly what that refers to. Therefore this model can only claim to forecast the theoretical value of the daily yuan fixing, with any deviations from the actual fixing interpreted as guidance from the PBOC.

Correlation

The model has closely tracked the official fixing in recent months. Run {**.CNYFIX13 Index CNYMUSD Index HS <GO>**} to analyze the correlation.

January through mid-February of this year was a period of near-panic about further yuan depreciation. Looking back, that volatile period appears to represent a temporary deviation from the PBOC's following of the fixing methodology and an attempt to reverse the pessimistic sentiment about the yuan then. In fact, we know now that the PBOC began adhering to this fixing mechanism following last August's huigai, and continues to do so today. In the first week of this year, the central bank adjusted its daily fixing progressively higher, exactly as per the then-still-unknown methodology, and set off a panic in the market. The PBOC then went through an extraordinary period of deviating from the methodology from early January through mid-February. Then calm returned to the yuan market, and the central bank reverted to the methodology. After the market settled down, a one-month correlation study (based on 22 trading days) shows that the tie between the model and the fixing rose to a level of almost 90 percent.

In late June, the PBOC again adjusted the fixing higher. This time, however, the market was aware of the new methodology. So as the fixing moved up, there was no panic. The additional level of transparency has helped the PBOC finesse its objectives—and has helped the market behave more rationally.

Conclusion

The market is getting an unprecedented amount of clarity and transparency from the PBOC about its daily yuan fixing process. That's good news, and you can use some simple tools on the Bloomberg to arrive at a reasonably useful model for forecasting the fixing.

Such a model has information value when it's closely tracking its target. But perhaps it can be even more revealing if it's wide of the mark. That may tell you when the target has moved—and could provide an early warning that the PBOC's policy has shifted.

Jen is an FX market specialist at Bloomberg in Hong Kong.

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FX

Should You Hedge Currency Risk? Here's How to Find Out

By OWEN MINDE

INVESTORS WHO BUY and sell global bonds and stocks continually face the question of whether to hedge the currency exposure of their investments.

The answer is complicated, of course. Some investors eschew currency hedging altogether. Strategic investors may plan to hold foreign-currency-denominated assets over such a long period that they expect FX fluctuations to mean-revert, with an expected return of zero. Other investors may hedge a fixed amount of their exposure.

Quants at Pacific Investment Management Co. recently put out a paper arguing that those common approaches are less than optimal. Instead, the Pimco researchers wrote, the hedging decision should be made on a currency-by-currency basis.

To dig into how a hedging strategy for a specific currency could work, you can use the Portfolio & Risk Analytics (PORT) function to explore the correlations of your FX exposures. You can then use the PORT optimizer to calculate an optimal hedge ratio based on an objective such as minimizing portfolio risk.

FOR EXAMPLE, let's assume you're based in the U.S. and take a look at the iShares MSCI Japan ETF. Run {EWJ US Equity PORT /P <GO>}. First, to set your calculation defaults to factor-based attribution, click on Settings and then on Calculation Defaults. As the Attribution Model, select Factor Based and hit Save.

The $14 billion ETF gained 4.6 percent this year through Nov. 1. To take a look at the sources of that performance, click on the Attribution tab and then on the Summary subtab. Let's look at the standalone performance of the ETF: Click on the arrow to the right of vs, select None, and press <GO>.

This year, through Nov. 1, the yen strengthened about 15 percent against the dollar. As a result, the currency factor group stands out as the dominant contributor to the ETF's return. Clearly, a traditional hedging strategy would not have been helpful for a dollar-based investor this year. To display the correlation matrix of Bloomberg's factor model, click on Currency:JPY at the bottom of the screen.

One interesting thing jumps out: The currency factor has a negative correlation with the Japan market factor. It was −0.55 as of Nov. 1. The reason: Markets view the yen as a safe-haven currency. Japan runs a persistent current-account surplus, and when markets go into risk-off mode, investors move into the yen looking for shelter. The result, as an International Monetary Fund study showed in 2013, is that the yen tends to appreciate when equity markets fall.

This unusual equity-currency relationship means that the currency risk actually reduces the risk of the overall portfolio. Click on the Tracking Error/Volatility tab and then on the Summary subtab. The Factor Risk Contribution (%) section of the screen shows the percentage contribution that the factor groups make to total risk. Here you can see whether a factor is increasing or reducing the risk of your portfolio. As suspected, the yen exposure was reducing the ►

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Run **{PORT <GO>}** and click on the Attribution tab to analyze the sources of a portfolio's return. Click on a factor to view a correlation matrix in the Factor Transparency window, as shown here.

overall risk of the portfolio by 4.76 percent.

So, should you hedge? And if so, how much? To find out, you can use the optimizer in PORT.

First, let's create two portfolios: One will consist of yen that we'll use to hedge. The other will hold the ETF. Run **{PRTU <GO>}** and hit Create. Name the portfolio "JPY Currency." Set the Asset Class as Balanced and click on Create. We want to create a portfolio with some history, so first in the Date field enter 01/01/00. In the Security field to the right of 11) enter JPY and select JPY Curncy from autocomplete. Type 1 in the Position field and save.

Run **{PRTU <GO>}** again, and hit Create. Enter a name such as "Japan Unhedged." Set the Position Type to Drifting Weight. Click on the Advanced tab and deselect Normalize Weights to 100%. Click on Create. In the Security field, enter EWJ and click on the ETF. Enter 100 as the Weight, then click on Save.

Now go to **{PORT <GO>}** again. Click on the arrow to the right of Port and select the Japan Unhedged portfolio if it's not selected already. Once it's loaded, click on the Trade Simulation button on the red toolbar and select Launch Optimizer.

Let's begin by assuming you're a strategic investor who wants to minimize risk. To start with the same setup in the optimizer, load a precanned task that hedges currency exposure. Click on the Tasks button and select Load Task. Then click on Hedging Tasks under Category, select Hedge Risk: Hedge Currency Risk and click on the Select button.

The optimizer is divided into four sections: Goals, Trade Universes, Constraints, and Security Properties. In Goals, click on the pencil icon to the left of Minimize. Type "Risk" in the Search field and press <GO>. Scroll down, select Portfolio Total Risk, and click on Select.

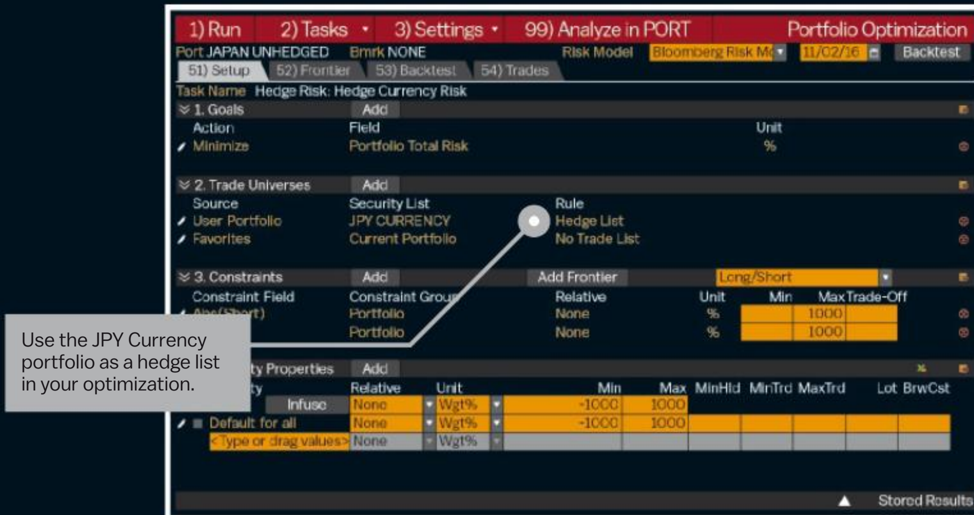
Next, let's set the trade universe we want to use to hedge the ETF portfolio. Click on the pencil to the left of Global Portfolio. In the Trade Universe window that appears, click on User Portfolio under Source and then click on JPY Currency. Make sure the Trade Rule is set to Hedge List and click on Select.

In the Constraints section, enter 1000 as the Max for both the short and long constraint. Click on Run.

Running this optimization on Nov. 2 reduced the overall risk of the ETF Portfolio from 17.25 percent to 17.21 percent. For a U.S.-based investor, that risk reduction came from buying yen and selling dollars! The optimal hedge ratio—buying yen worth 10.62 percent of the portfolio—derives from the negative correlation between stocks and the yen.

Let's now consider a tactical investor who also cares about maximizing return. Click on the Setup

In PORT, click on Trade Simulation on the red toolbar and select Launch Optimizer to set up and run a currency hedging optimization.



The optimal hedge ratio to minimize portfolio risk is to buy yen and sell dollars in a weight equal to 10.62 percent of the portfolio.

tab, and then on the Add button in the Goals section. Type “Return” in the Search box and select Expected Return (%) (User-defined) and click on Select. Set the Trade-Off to 1 to equally weight the two objectives.

Now you need to add your expected returns for both the yen and the ETF. In the Security Properties section, enter EWJ US Equity in the amber box below Default for all. Enter 5 in the ExpRtn column. Next, enter JPY Curncy and click on the matching Japanese yen spot item. For the expected return of the currency, you can consider the forward points as the cost of currency hedging. Run **{USDJPY Curncy FXFA <GO>}** on another Bloomberg screen to see the difference between the implied USD Yield and the JPY Yield from the FX forwards points. In the one year tenor, the difference was about 1.7 percent. So, in the optimizer, input −2 into ExpRtn to show a positive annual expected return of 2 percent from buying U.S. dollars and selling yen. Now rerun the optimization.

By adding a positive expected return from hedging, the optimizer now says you should buy dollars and sell yen. That will increase portfolio risk a bit but also improve expected return. In effect, you’ve maximized your Sharpe ratio by reversing your hedge.

Clearly, taking a currency-by-currency approach to hedging could pay off. ●

Minde is an FX market specialist at Bloomberg in New York.

Mortgages

Here's How To Find Out If You Should Pay Up For a Specified Pool

By MICHAEL MORRISSEY

MORTGAGE-BACKED securities have had a good run this year. The Bloomberg Barclays US MBS Index generated a total return of 3.6 percent through Oct. 21. To dig into the U.S. MBS benchmark and its constituents, run **{IN <GO>}** and right-click on the index's name for a menu of analytics.

With the Federal Open Market Committee on hold for much of the year, mortgage investors had been concerned with prepayment risk. Now, if rates rise, that scenario may flip and they'll start to focus on extension risk: Slowing prepayments could lengthen the expected average lives of MBSs. One solution is investing in specified pools, which let you select assets with unique characteristics that can mute prepay sensitivity.

Consider low-loan-balance pools, for example. A homeowner with a mortgage balance of $85,000 or less is relatively unlikely to refinance, because doing so might reduce her monthly payment by only a small amount, say $40. So characteristics such as loan size, geographic concentration, and seasoning are among the most sought-after features in specified pools. For pools with these and other characteristics, you can see indications of the payups—the amount that the market is willing to pay over the prices of generic to-be-announced securities, or TBAs—by running **{MPAY <GO>}**.

When interest rates move, specified-pool payups tend to go in the opposite direction. As rates rise and prepay optionality decreases, payups over TBAs fall. You can use MPAY to see indicative levels of payups for pools with various characteristics. Select the Historical BVAL setting, and you can see what the indicative levels were as of a selected date. For example, on July 8, when the 10-year Treasury yield was 1.36 percent, the payup for 100 percent New York 30-year 4 percent pools was 1 point and 23+ 32nds. After the 10-year Treasury yield rose to 1.73 percent as of Oct. 21, the payup declined to 1 point and 16 32nds.

But how can investors determine whether this payup is warranted? Traditional methods of calculating yield and spread are the most common measures. Many investors also choose to run an option-adjusted spread analysis and compare the results of spread, duration, and convexity. OAS certainly provides a convenient framework for comparing the relative value of similar bonds. However, some investors prefer a more transparent analysis. One popular way of determining the relative richness or cheapness of a specified pool is to derive the amount of time needed to earn back the payup premium. Many strategists employ a roll analysis methodology as a way of doing that.

Traditional dollar-roll, or roll, analysis seeks to determine if an investor should continue to hold a

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953 Fifth Avenue. This stunning Robert Couturier designed duplex is the epitome of high style elegance and refinement. WEB: 00111143. **$8,500,000**. Serena Boardman.

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Run **{MPAY <GO>}** for indications of the payups on specified pools—the extra amount the market is willing to pay for mortgage assets with unique characteristics.

1) Refresh | 2) BVAL Information (BVLI) | Conventional Mortgage Payup Matrix

Latest | Historical BVAL 10/21/2016 NY 4PM | BVAL data as of Oct-21-2016 NY4PM
TBA Price Source CBBT | CBBT data as of 13:03

TBA Bid Price (CBBT)	30Yr 3	30Yr 3.5	30Yr 4	30Yr 4.5	15Yr 2.5	15Yr 3	15Yr 3.5	15Yr 4
FNMA TBA	103-09+	105-05+	107-04+	109-10	103-01+	104-21+	105-15	103-12
FGLMC TBA	103-10+	105-03+	107-00	109-09	103-01+	104-22	105-23+	103-05
BVAL Non Standard Payups								
Low Loan Balance (85K)	0-25+	2-01+	2-20+	3-11+	0-09	0-27+	2-06	1-14+
Medium Loan Balance (110K)	0-22	1-18+	2-10	2-20	0-07	0-24+	1-24	0-29
High Loan Balance (150K)	0-13+	1-05	1-16+	1-12	0-05	0-22+	1-15+	0-28
Super High Loan Balance (175K)	0-13	0-28	1-04+	1-11+	0-03	0-17+	1-01	0-23+
100% New York	0-10+	1-06+	1-16	1-17+	0-00	0-10+	1-06+	1-16
MHA LTV 80-90%	0-01	0-06+	0-16	0-26	0-00	0-04	0-14	0-14+
MHA LTV 90-95%	0-01+	0-[illegible]4+	0-26+	0-27+	0-02	0-07	0-12	0-10+
MHA LTV 95-100%	0-03	[illegible]-18+	1-01	1-04	0-03	0-07	0-19	0-24+
MHA LTV 100-105%	0-04	0-21+	1-06+	1-19+	0-06	0-14+	0-21+	0-24
[illegible]05-125% (CQ)	0-07	0-27+	1-13+	2-00	-0-01	0-09	0-07+	0-13
[illegible]5+% (CR)	0-0[illegible]	1-03	1-14	2-04+	-0-21+	0-09	0-08+	0-30
[illegible]arty Origination	0-01	0-02+	0-02+	0-03+	0-02+	0-09	0-06+	0-06+
[illegible]oning Payups								
[illegible]	0-00	0-01	0-05+	0-21+	0-01	0-05+	0-23+	1-02
[illegible]	0-01+	0-00+	0-02	0-15+	0-00+	0-01	0-07	1-25
[illegible]	0-05	0-04	0-04+	0-05+	0-01	0-02+	0-07+	2-11
[illegible]10Yr Payups								
20Yr	1-07+	1-03+	1-09	0-15+	--	--	--	--
10Yr	--	--	--	--	0-02	0-06	0-17	

The payup for 100 percent New York 30-year 4 percent pools was 1 point and 16 32nds as of Oct. 21.

TBA position or roll it to the forward month at a lower price, thereby avoiding prepayments. The difference in price between the current settle month and the forward settle month is referred to as the drop. Market prices determine the drop, and many technical and fundamental factors affect these levels. Mortgage originations, Federal Reserve buying, collateralized mortgage obligations' bid, and deliverable pool characteristics are just a few of these factors.

For the purpose of this analysis, you're less concerned with whether to hold the TBA or roll it. Instead, you're looking for the breakeven drop that reflects the point of indifference between rolling and holding. Once you determine that level, you perform the same analysis on the specified pool. The difference in drops is another way of observing the relative expected return of the two bonds. For example, run **{FNCL 4 Mtge RA <GO>}** to analyze the roll and drop of 30-year FNMA 4 percent TBAs. Using a price of 106-00, a reinvestment rate of 55 basis points, and the six-month average prepay speed of 23 CPR, the breakeven drop is 6.2 ticks, or 32nds. Compare this with **{FN BA2908 Mtge <GO>}**, a lower-loan-balance pool (maximum loan size: $175,000), at a price of 106-20 (payup of 20 ticks). Using six-month historical prepays (3.3 CPR), the breakeven drop is 9.7 ticks.

Divide the payup of 20 ticks over TBAs by the difference in drops of 3.5 ticks (9.7-6.2). By this analysis, it will take 5.7 months to earn back the payup premium [20/(9.7-6.2)]. If prepays on the TBA drop to 15 CPR, the breakeven drop on the TBA increases to 7.5, still 2.2 ticks below the breakeven drop of the specified pool. In this case it will take approximately nine months to earn back the payup premium [20/(9.7-7.5)]. Running this analysis on several specified pools will allow you to spot relative value by determining the shortest breakeven periods.

The Roll Analysis page (RA) is useful for analyzing TBAs and specified-pool rolls and drops. To analyze a list of bonds, you can use the Roll Analysis sample spreadsheet. To download a copy, go to **{XLTP XMRA <GO>}** and click on the Open button.

In the spreadsheet, enter the TBA and specified-pool tickers. Make sure the start and end dates reflect the appropriate time frame. Adjust the price accordingly. Next, enter the expected prepay rate in CPR and the reinvestment rate. The breakeven drop is displayed in the Drop column. Once you've saved a copy of the sheet, you can customize it by adding a column that calculates the breakeven months.

Morrissey is a mortgage market specialist at Bloomberg in New York.

Quantimentals

Trading the News: Use Machine-Readable Data to Find Alpha

By LEI HUANG and DANIEL CAPORALETTI

SYSTEMATIC TRADING IS an ever-evolving competition. One key arena in that contest: the inputs used in quantitative trading models. Over the years, the list of data sets that quants use has expanded from those based on historical prices, to statistical cross-asset correlations, to exposures to unique risk factors and beyond. To get an edge, many quant researchers and portfolio managers are continually looking for unconventional, independent factors that make sense.

News represents a rich source of data sets for developing trading strategies.

Many features of news-based information make it especially appealing. Real-time news, though less structured than conventional fundamental valuation measures, usually encodes the first clues of major changes affecting a company. You could, for example, use news fragments to build statistical forecasting models that dynamically adjust price targets.

Another promising source of information is social media, systems in which the feedback on content can be directly measured. Sharing items, for example, tends to separate noteworthy content from ambient noise. Replies and discussions provide on-the-spot feedback about opinions and emotional responses.

Aggregated data on news supply and demand can be used to detect abnormal spikes. Often, such spikes happen alongside major company events. When you track such analytics for a large portfolio of stocks, you can identify market focus and hot-spot stocks in real time.

The advantages of news-related data are obvious—but so are the technical challenges. Deriving quantitative indicators from text is daunting—it could, for example, require experts to prepare and maintain a set of classification codes and taxonomies. Although there's a large amount of academic research in the field, significant advances began only recently with the availability of efficient machine-learning techniques and high-performance computing hardware.

Researching signals and backtesting strategies require large amounts of sample data. You need both broad news coverage and deep historical securities data to evaluate performance.

BLOOMBERG'S Event Driven Feed (EDF) is an enterprise product that provides machine-readable news-derived data. For Bloomberg-generated news and third-party content, it delivers two levels of data. Story-level analytics calculate quantifiable metrics for individual news stories—sentiment and impact, for example. Company-level analytics aggregate information for individual companies to track continuing developments.

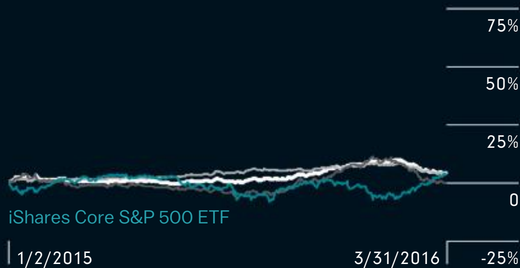
EDF can be delivered in two ways: as real-time streaming data available via an application program interface, or API; or as end-of-day files that can be downloaded via Secure File Transfer Protocol, or SFTP. For strategies that focus on intraday moves, the EDF API provides live access to incremental information. Asset managers with longer holding periods may find

Social Sentiment

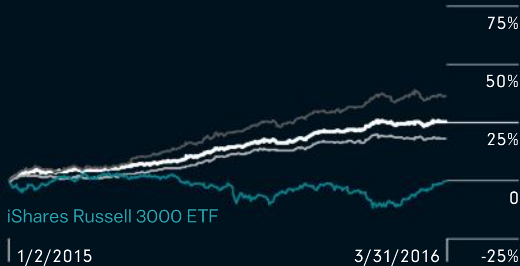
To test the viability of a social media-based sentiment indicator, we constructed portfolios using stocks in three major U.S. indexes: the S&P 500, Russell 3000, and Russell 2000. Each day, a long-short basket based on social sentiment rankings was created at the market open, held through the day, and liquidated at the close. The backtests looked at three types of portfolios.

Proportional: *Weights all stocks by sentiment score, going long those above the mean and short those below.*	***High-Minus-Low One-Third:*** *Goes long the top one-third of stocks ranked by sentiment score and short the bottom third, equally weighting all stocks.*	***High-Minus-Low 5 Percent:*** *Goes long the top 5 percent ranked by sentiment score and short the bottom 5 percent, equally weighting all stocks.*

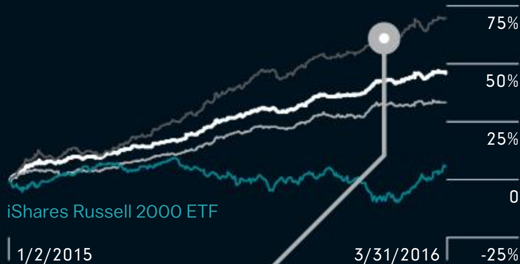
S&P 500



Russell 3000



Russell 2000



This approach shows promise for the small-cap stocks in the Russell 2000.

Source: Bloomberg

the end-of-day solutions fit their needs.

The news-derived data sets also power Bloomberg functions. Run **{GN <GO>}** to visualize how a selected stock price correlates with news sentiment, or go to **{GT <GO>}** for Twitter sentiment.

SO HOW CAN you use EDF? Let's take a look at one key indicator: sentiment derived from social media. Sentiment, essentially a gauge of herd mentality, can be considered a driver of price momentum. To test the viability of using social sentiment as a trading signal, we worked with Bloomberg researchers and ran a series of backtests. Using stocks from major U.S. indexes, we constructed three types of long-short equity portfolios.

The first was a proportional portfolio. It weighted each stock in the index by the deviation of its sentiment score from the mean score. If above the mean, the portfolio would buy the stock; if below, it would short the shares.

The second type, a so-called high-minus-low, one-third portfolio, was more concentrated. It would go long the top one-third of the index stocks ranked by sentiment and short the bottom one-third. All the selected stocks were equally weighted.

The third was even more focused. It went long the top 5 percent and short the bottom 5 percent, equally weighting all the selected stocks.

In the test, a basket of stocks was created each day when the market opened. The shares were held throughout the day and liquidated at the close. The test ignored transaction costs and risk management.

To analyze differences among market-cap groups, we used three indexes: the S&P 500 as a proxy for large-company stocks, the Russell 3000, and the Russell 2000 for small-company shares. Over the 15-month period of the backtest, eight of the nine sentiment-driven portfolios performed better than the benchmarks. In addition, the portfolio returns displayed low volatility, low beta, and high alpha. Sharpe ratios, a measure of risk-adjusted returns, were higher than those of the benchmarks for eight of the nine portfolios, ranging from 0.66 to 5.77.

A key finding: Performance was consistently better for the small-cap portfolios. One explanation is that because of the lack of analyst coverage and market attention, it takes longer to price in fundamental changes. Such market inefficiencies could make news-based analytics stronger predictors.

For additional details of this analysis, go to **{EDF <GO>}**, click on EDF Research Notes and then on the link for the Social Sentiment study.

Huang and Caporaletti are product managers for Enterprise Solutions at Bloomberg in New York.

FX

How Hedging, Liquidity, and A Certain Someone Upended the Year of the Peso

By JESSICA BRICE and ISABELLA COTA

FOR THE MEXICAN PESO, 2016 wasn't supposed to end this way.

At the beginning of the year, most currency forecasters agreed: The peso was grossly undervalued. Estimates compiled by Bloomberg at the time put it on course for the biggest gain among major currencies. Bank of America said things would get better; Citigroup and HSBC Holdings said they certainly wouldn't get any worse.

Yet as 2016 draws to a close, the peso isn't an emerging-market standout. Instead it's the world's worst performer. Battered by events far beyond its borders—such as the U.K.'s Brexit referendum—the currency tumbled 6 percent against the U.S. dollar this year through Nov. 8. And then Donald Trump was elected president of the U.S.

Overnight, the peso plunged more than 13 percent, surpassing 20 per dollar for the first time. Mexico's peso was worth less than a nickel. It will likely end the year posting its fourth annual decline.

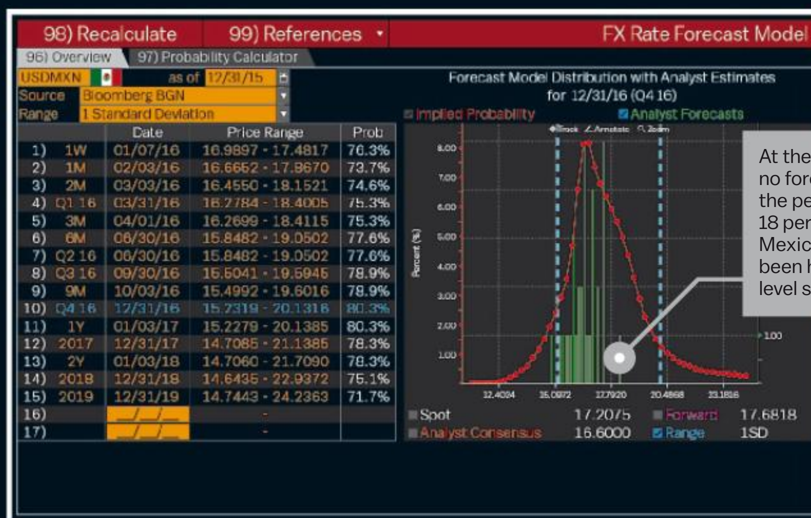
For much of the year, the Mexican currency's performance tracked Trump's up-and-down performance in the polls. In September and again just before the election, when polls suggested the Republican presidential candidate had a decent shot at the White House, the peso took big hits—and not only because of Trump's "build a wall" rhetoric.

HOW FX FORECASTERS got the call so wrong is a story that dates to the so-called Tequila Crisis in the mid-1990s, after which the Mexican government—desperate to claw its way back from near collapse—instituted a regulatory framework to bolster peso trading. In the two decades since, the peso has emerged as the hedge of all hedges.

"The peso used to only be a proxy hedge for emerging markets," says Eduardo Suárez, a strategist at Bank of Nova Scotia in Mexico City. "Now it's a hedge for everything." The change was gradual, Suárez adds, until recently, when it became exponential. Over time, what started out as the Mexican financial market's greatest strength—its liquidity—has turned into one of its biggest liabilities.

Mexico's fundamentals don't support the case for such currency weakness, say surprised strategists. Inflation is in check, the nation's credit rating is still investment-grade, and economic growth estimated at 2.1 percent this year looks downright bountiful compared with recessions in Brazil and Russia, home to the two of the world's best-performing major currencies. To many longtime

Go to **{USDMXN Curncy FXFM <GO>}** to compare analyst forecasts with probabilities implied by trading in FX options.



At the end of last year, no forecasters expected the peso to trade above 18 per dollar. Yet the Mexican currency has been higher than that level since May.

Mexico watchers, the peso's behavior makes no sense ... until you look at how markets abroad have been behaving in recent years. To protect against lower commodities prices, slowing growth in China, instability in Europe, or just about anything, really, traders have been shorting the peso.

So-called short positions, or bets the peso is going to fall, have outnumbered long holdings for a record 26 months. Before now, there had been only two periods that came close (if the six-month stretch in 2009 and the eight months in 2002 can even be considered close).

Correlations between the peso and many major assets are rising, including oil, the British pound, and—most important—the S&P 500, seen as a bellwether for global growth expectations. The daily linear correlation between the peso and the index has almost doubled from a year ago, to 0.47, the most of any emerging-market currency. (A correlation of zero means the assets are independent of each other; 1 means they move in lockstep.)

As a result, the peso isn't just a story about Mexico or the U.S. anymore, says Andrés Jaime, a Barclays strategist and former cross-asset strategist for Mexico's central bank. "There's a story for oil, a story for China, a story for global growth," he says.

DRIVING DEMAND FOR the hedge is the peso's 24-hour, five-days-a-week trading. That's a rarity in Latin America, where Brazil's real and the Chilean peso trade during set business hours. The peso's also the second-most liquid emerging-market currency (it lost the top spot this year to China's yuan). Its average daily turnover was $112 billion in April, the latest figures available from the Bank for International Settlements. That's about twice the ruble or the rand.

"This is the year of extreme volatility for Mexico," says Juan Carlos Rodado, director of Latin America research at Natixis North America and the top peso soothsayer in the third quarter, according to Bloomberg rankings. He sees no reprieve in 2017. "It becomes a problem," he says, "when the currency is trapped by that volatility and you're forced to increase interest rates" to curb speculation.

By that measure, volatility is a problem. Mexico's central bank, known as Banxico, startled markets with two surprise interest rate hikes in 2016 and a third that was largely expected, but only because strategists began including the extreme peso volatility in their forecasts. As recently as December 2015, Banxico Governor Agustin Carstens had signaled he'd embark on a tightening cycle when the U.S. Federal Reserve started raising rates. ▶

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For much of the year, the peso tracked Donald Trump's ups and downs in the polls.

IT USED TO BE that liquidity for Mexico was a virtue. In 2000 the country sold 10-year peso-denominated bonds to foreigners. The sale, unheard of at the time after a wave of developing-world defaults in previous decades, marked a major victory for a country that had itself been on the verge of financial collapse only five years earlier, says Antonio Sibaja, chief investment officer of Invercap and a former Banxico official in charge of implementing foreign exchange policy. It also set off a virtuous cycle that deepened liquidity and allowed the government to further diversify instruments.

To Mexicans, the Tequila Crisis of the '90s was their Lehman Brothers, only the government couldn't keep the lid on the contagion. After a sudden peso devaluation in December 1994, foreign investors fled overnight, Banxico was forced to break a managed peg to the dollar, and the currency collapsed. Inflation surged to more than 50 percent the following year. Within a month of the devaluation, the U.S. stepped in, coordinating a $50 billion bailout.

In 1995, to strengthen the new floating-exchange-rate regime, the central bank pushed additional deregulation to allow new financial instruments, specifically futures and options. In April of that year, Banxico authorized the operation of foreign exchange markets dealing in U.S. dollar derivatives involving pesos, and the Chicago Mercantile Exchange launched a peso futures contract, the first emerging-markets product of its kind to be traded on the bourse.

Those steps bolstered the peso's liquidity, but it wasn't until 2004, after Mexico's finances improved and international markets stabilized following the dot-com bust, that Sibaja and other Banxico officials started to notice how the peso was beginning to trade outside Mexico and the U.S. "The peso began to have such liquidity and depth," he says, "that suddenly it was everywhere."

Today, Mexico's solid finances relative to those of peers, the currency's free float, and transparency mean the peso will remain the world's hedge, Invercap's Sibaja says. "Will it ever stop being a proxy hedge?" he asks. "It would either have to be a market-driven event, or we would have to suddenly become the Bolivarian Republic of Venezuela." ●
—*With Ralph Cope*

Brice is an emerging-markets editor at Bloomberg News in São Paulo. Cota covers the Mexican peso and fixed income in Mexico City.

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The Man Who Ran China's Biggest Bank Looks West

By BLOOMBERG NEWS

PHOTOGRAPH BY ADAM DEAN

JIANG JIANQING CONSIDERS himself a connoisseur, not of fine French wines, which you might expect from a banker of his stature, but rather of financial crises.

During a career in Chinese banking that's spanned four decades—including time as the head of Industrial & Commercial Bank of China, the world's biggest lender by assets—Jiang has studied meltdowns through the ages. He's written books and articles on banking history and the not-so-infrequent financial crises the world has witnessed over the past few centuries. "Younger generations will forget the reasons," he says in a recent interview, pointing to three enduring themes behind the calamities: economic imbalances, shoddy regulation, and greed.

Will China—home to bad-debt-burdened banks, heavily indebted companies, and an overheated housing industry—be the scene of the world's next financial train wreck? The debate is one of the biggest in global finance. To bearish investment banks and contrarian investors, China is sliding toward either a crisis or stagnation as ever-greater amounts of credit deliver ever-diminishing economic returns.

Jiang, 63, dismisses this sort of analysis from Western financiers and economists as alarmist. Relaxed and contemplative, having retired as chairman of ICBC in May, he says he doesn't see any signs of a meltdown. And he rejects claims that banks such as ICBC are hiding mountains of undeclared bad loans. Wild predictions to the contrary, he says, betray a lack of understanding of how China works and how far the Chinese financial system has come. "As Chairman Mao once said, 'If you want to know the taste of the pear, you must taste the pear,'" says Jiang, who worked as a farmhand and miner during the Cultural Revolution, long before he joined the banking elites. "Some people write a lot of reports or articles about how a pear tastes by using only their imagination."

The financial industry is rolling out one warning after another. A Deutsche Bank report in September cautioned clients about a potential housing bubble in Shanghai, Shenzhen, and other major Chinese cities. In October, Goldman Sachs called on the government ►

of Xi Jinping to urgently weed out “zombie” state-owned enterprises. Hedge fund manager Kyle Bass estimates Chinese banks face $3.5 trillion of losses as an unprecedented rise in credit that started in late 2008 reaches a breaking point. “This number is relevant due to the fact that it is significantly more than the entire equity capital in the Chinese banking system,” Bass said in an e-mail. Similarly, billionaire George Soros warns of a hard landing, while another investor, Jim Chanos, sees China retracing the mistakes Japan made in its bubbly late 1980s. In October the International Monetary Fund said the window was “closing quickly” on China’s ability to contain the risks from an explosion in corporate debt, which has reached 165 percent of gross domestic product.

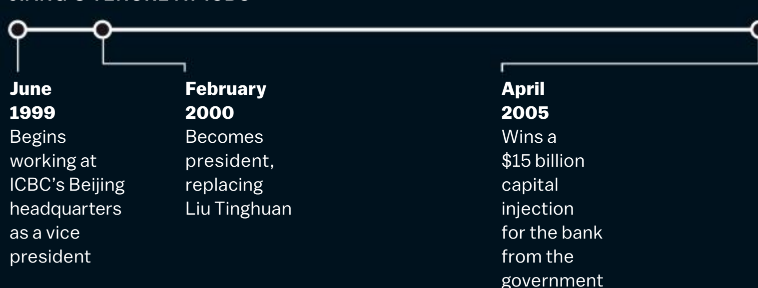
Jiang’s different perspective is born of a 37-year career that mirrors the rapid rise of China’s $11 trillion economy as well as the stop-start modernization of its financial system. When he became president of ICBC in 2000, he inherited a bank that was mired in bad debt, in need of a government bailout, and bereft of risk-management controls.

He turned things around. ICBC’s bad-loan ratio is lower than 2 percent, compared with 34 percent when he started working at the bank’s Beijing headquarters in 1999. (Judged by today’s reporting standards, he says, the ratio then would have been 47.5 percent.) He counts improvements in risk controls among his proudest achievements. According to Jiang, ICBC now classifies loans in 13 categories based on repayment risks, using a methodology that’s stricter than the five-category system required by the China Banking Regulatory Commission.

Jiang ran ICBC during the biggest expansion of credit in history. The asset value of Chinese banks jumped 276 percent in eight years, to 218 trillion yuan ($33 trillion) as of June. That’s more than double the amount held collectively by U.S. commercial banks. ICBC had a market capitalization of $228 billion in early November.

After overseeing the bank for 16 years, Jiang left to head an ICBC-led fund that plans to raise as much as €10 billion ($11.1 billion) to invest in central and Eastern Europe. The venture is part of China’s One Belt, One Road program to promote trade and economic development along ancient Silk Road maritime and land routes. It will focus on investment in infrastructure, high-tech manufacturing, and consumer goods, according to statements from ICBC and the Chinese government.

Heading the investment fund is a natural fit for Jiang, says Keith Pogson, a Hong Kong-based managing partner at Ernst & Young who worked with Jiang as ICBC’s auditor from 2001 to 2012. “ICBC has been at the forefront of financing the infrastructure build-out both



inside China and, increasingly, with Chinese projects or businesses outside China,” he says. “That experience would be invaluable in doing similar things in Eastern Europe. Remember, that is really where One Belt, One Road ends up.”

Although Jiang climbed to the pinnacle of Chinese banking, his salary last year was all of $81,000, or 0.3 percent of the $27 million earned by JPMorgan Chase Chief Executive Officer Jamie Dimon. Given his minister-level status in Chinese officialdom, Jiang probably enjoyed certain perks, such as a car and driver, but ICBC doesn’t disclose them.

SHANG SHAN XIA XIANG! “Up to the mountains, down to the villages” was a rallying cry of Mao’s Cultural Revolution. It recalls a tumultuous time beginning in the ’60s when millions of urban youth such as Jiang were sent to the countryside to be re-educated by the peasants. He remembers tearful scenes among families at the railway station when he left his native Shanghai in 1970—a 17-year-old embarking on a four-day trip by train, bus, and foot to a remote part of Jiangxi province.

While someone his age elsewhere in the world might have been studying at a university, Jiang was working—first as a farm laborer and then as the lone teacher in a school, instructing kids in everything from mathematics to music. Later he was a coal miner in Henan province. For him, re-education worked. “The experience made me better understand grass-roots Chinese society,” he says.

Jiang’s first banking job came in 1979. He was a teller in Shanghai at the corporate banking counter of a three-counter branch of the People’s Bank of China, he says. As a banker in a government-dominated system, Jiang would have learned to balance “political and business interests,” says He Xuanlai, a Singapore-based analyst at Commerzbank.

By 1993, 15 years into the opening up of China under Deng Xiaoping, Jiang had become deputy head

Source: {1398 HK Equity GP <GO>}

of ICBC's Shanghai branch. Within a couple of years he was running what's now the Bank of Shanghai. In 1997 he rejoined ICBC as its Shanghai head. Two years later—as Premier Zhu Rongji was restructuring some of the nation's giant state-owned enterprises, triggering mass layoffs—Jiang was named a vice president for ICBC.

Tackling a vast heap of nonperforming credit and establishing effective risk controls proved to be "a tremendous challenge and pressure," he says. But according to Fred Hu, a former Greater China chairman of Goldman Sachs who worked with him, one of Jiang's biggest achievements was the politically sensitive task of cutting a bloated workforce that included some poorly educated staff and ex-military personnel who lacked the skills needed at a modern bank. At its peak in 1995, ICBC had about 570,000 staffers, according to the bank. Now, 21 years later, with a vastly expanded loan book, it has 459,000 employees.

Making the cuts, as well as modernizing the bank by investing heavily in technology, was no easy task for Jiang. "He had the guts to withstand any political pressure, to do whatever he thought was necessary to put ICBC on the right footing," says Hu, the founder of private equity fund Primavera Capital Group and nonexecutive chairman of fast-food business Yum China. What's more, Hu says, Jiang maintained a passion for his job even while he was "getting paid like a junior analyst of an investment bank."

Jiang would prove unusual among his peers at the big Chinese state banks for staying in his role for so long rather than jumping to another party appointment, such as running a financial regulatory agency or a province. During his time at ICBC, he made his mark as an effective salesman—first by persuading Goldman Sachs to buy a 5.8 percent stake in the bank, then by taking it public in 2006, raising $22 billion, a world record at the time. "He's clearly one of the fathers of modern-day Chinese banking," Ernst & Young's Pogson says.

Although Jiang considers China's bad-debt workout during the 1990s more challenging than anything his country faces today, he sees thorny challenges ahead. The Chinese economy has decelerated from double-digit growth rates, slowing every year since 2010, and lenders need to cut off credit to the "zombie" companies as part of what will be a protracted deleveraging for the country. Over the past two to three years, Jiang says, economic restructuring has put pressure on nonperforming loans. He says controlling the level of bad debt is "testimony that the risk-control systems we put in place have worked well."

China has more work to do to get its financial sector on a firmer footing. Jiang says companies need to be encouraged to tap capital markets for financing instead of relying on bank loans, while wealth management products—worth $3.9 trillion—need better regulation and more transparency, with investors carrying the risks.

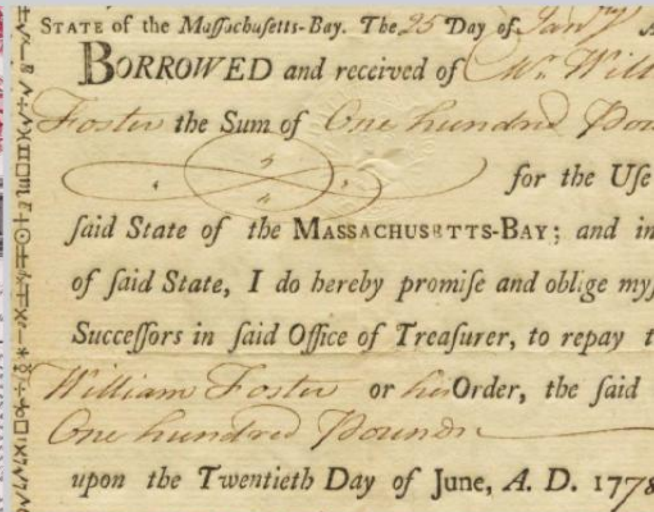
Ever the historian, Jiang takes the long view of the evolution of Chinese banking. "The Western banks have more than several hundred years of history," he says. "The modern banking system started late in China." Looking ahead, he casts a wary eye on China's growing web of shadow lending, with banks channeling money through intermediary structures to bypass capital and loan-loss provision requirements.

Jiang doesn't gloat about the comeuppance some non-Chinese banks endured during the global financial crisis. "The lesson we have learned from Western banks during the global financial crisis is that if China enters the water of financial reform and innovation," he says with a smile, "we ought to enter at the place that is most shallow."

As Jiang embarks on a new chapter in his career, the water will have to get deeper without him. ●

—Additional reporting by Jun Luo and Heng Xie, with Cathy Chan and Paul Panckhurst

Paper notes look like antiques now
that electronic-order execution rules the day



Industry Focus

Fixed Income

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AN EXPANDING UNIVERSE
Index market cap

Sources: {LEGATRUU Index GP <GO>}, {MXWO Index GP <GO>}

A few things have changed in fixed income through the years, such as electronic trading turning commercial paper into a collectible. One new and noteworthy change: Bloomberg's recent acquisition of fixed income's flagship benchmarks, now known as the Bloomberg Barclays Indices. Dating to 1973, these indexes originated at Kuhn Loeb, transitioned to Lehman Brothers, then Barclays, before being purchased by Bloomberg. In the pages ahead, Bloomberg Intelligence—our research platform providing analysis and data sets on industries and companies at {BI <GO>}—helps you gain insight into these powerhouses. ▶

1 More Than $45 Trillion of Bonds Is Now at Your Fingertips

■ The Bloomberg Barclays Indices, which you can access at **{IN <GO>}**, bring heightened transparency to both the buy and sell side of the fixed-income market.

WELCOME TO THE FAMILY: The benchmark indexes span global markets covering multiple asset classes and provide a road map for investing in fixed income. They include more than 80,000 securities from 75-plus countries in more than 36 currencies.

BOW TO "THE AGG": The Global Aggregate is the leading source for benchmark index performance. The index's almost 18,000 members represent the largest, broadest, most-liquid, investment-grade-rated fixed-income securities in the world. Collectively the bonds have a market value of almost $45 trillion.

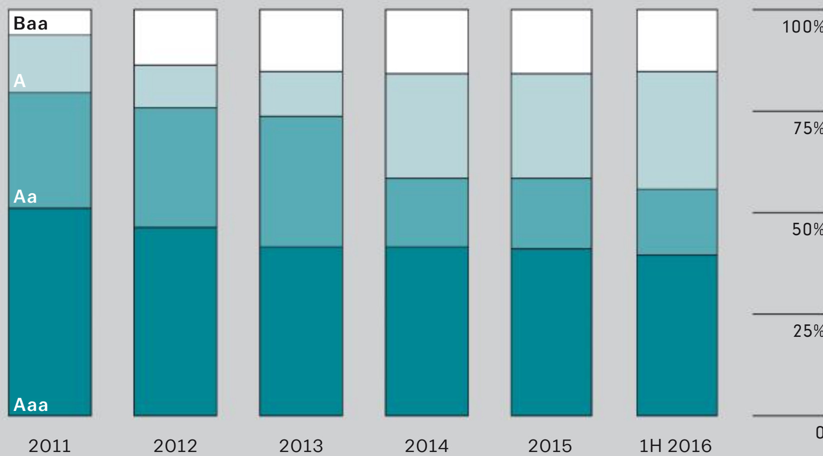
HARNESS THE POWER: One reason the Agg is such a force in fixed income is its history. It's difficult to develop a benchmark, especially in fixed income; this one was created in 1999 and later backfilled to 1990, providing users with years of data to inform their investing decisions.

MEMBERS ONLY: Bloomberg users can now access the indexes' membership, for today and historically—a major development in terms of transparency. The indexes update nightly and rebalance monthly. A daily rebalanced "projected" membership for the global agg is available by typing **{LEGASTAT INDEX MEMB <GO>}**.

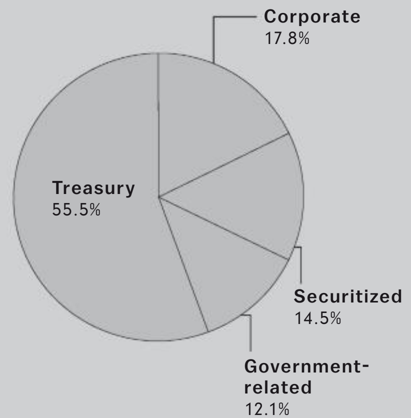
IT'S ALL ABOUT CUSTOMIZATION: Among other uses, membership data can be helpful for optimizing a custom portfolio. Total-return money managers will work to outperform the reference benchmark, for instance, while a passive strategy might look to replicate the return of a reference benchmark.
—*Richard Salditt, BI fixed-income strategist*

COMPOSITION OF THE BLOOMBERG BARCLAYS GLOBAL AGGREGATE INDEX

Share of market value by bond quality



Share of market value by sector
1H 2016



Source: Bloomberg Indices

2 Understand The Drivers Behind The Data

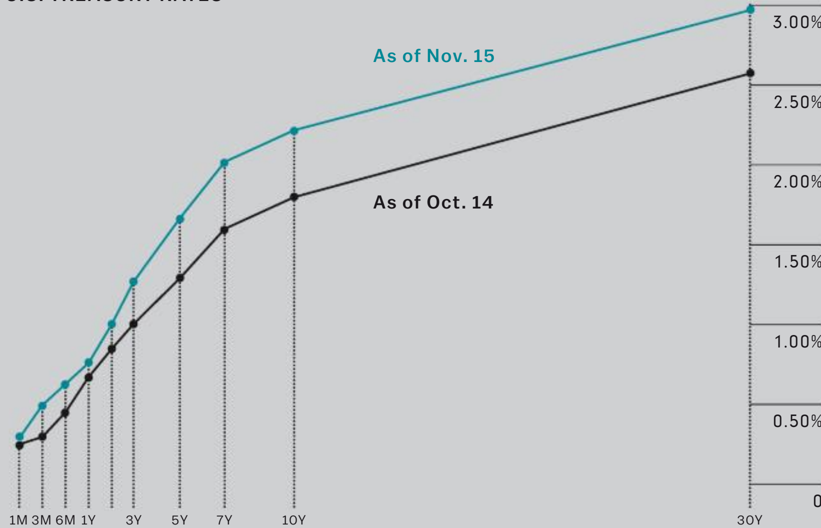
■ Bloomberg Intelligence Credit Strategy combines macro, thematic, and relative-value-based research covering critical factors influencing U.S. and global high-grade and high-yield credit markets. It also references the Bloomberg Barclays Global Family of Bond Indices and Bloomberg's powerful analytics including Portfolio & Risk Analytics **{PORT <GO>}** and Bloomberg Valuation **{BVAL <GO>}**. Learn more at **{BI STRT <GO>}**.

PREVIOUS SPREAD: MUSEUM OF AMERICAN FINANCE (4)

3 The Yield Curve Steepens

■ The most important message from bond markets after Donald Trump's victory and retention of a Republican majority in Congress? The steepening of the U.S. Treasury yield curve, indicating that markets anticipate better odds of fiscal policy implementation. Trump has proposed prioritizing infrastructure, reducing the corporate tax rate to 15 percent, and simplifying the individual tax code. The risk to the bond market is that fiscal policy stimulates growth and inflation, which could increase Treasury bond supply.

U.S. TREASURY RATES



Source: {YCGT0025 Index <GO>}

4 Inflation Watch

■ The yield curve is steepening in anticipation of less accommodative central bank policies and higher inflation. Three market-based forward inflation gauges point to a rise: the breakeven rate on five-year Treasury Inflation-Protected Securities, the Fed's five-year forward breakeven inflation rate, and the five-year, five-year forward breakeven inflation rate on zero-coupon bonds. (Run **{G #BI 4368 <GO>}** on your terminal for a chart showing them moving in tandem.) The case for higher inflation was also supported by a November employment report reflecting the highest pace of average hourly earnings growth since June 2009. Together these factors are sounding alarm bells, particularly for longer-duration bonds. That said, inflation has previously failed to support higher interest rates before, specifically in 2013 and then again in 2015.

5 The Impact of the U.S. Election

■ Here's an insight from studying bond returns over the 10 most recent presidential election cycles: During the three months after an election, the direction of monetary policy is a more important influence than the election results. Depending on whether the Federal Reserve was tightening or easing policy, bond returns differed by 1.6 percentage points. Republican vs. Democratic outcomes resulted in a 0.3 percentage-point difference in returns.

THREE-MONTH RETURN AFTER A PRESIDENTIAL ELECTION

	Republican elected	Democrat elected	Fed tightening	Fed easing
Average fixed-income return	2.9%	2.6%	2.2%	3.8%
Average equity return	5.1%	4.8%	6.2%	2.6%

Source: Bloomberg Intelligence

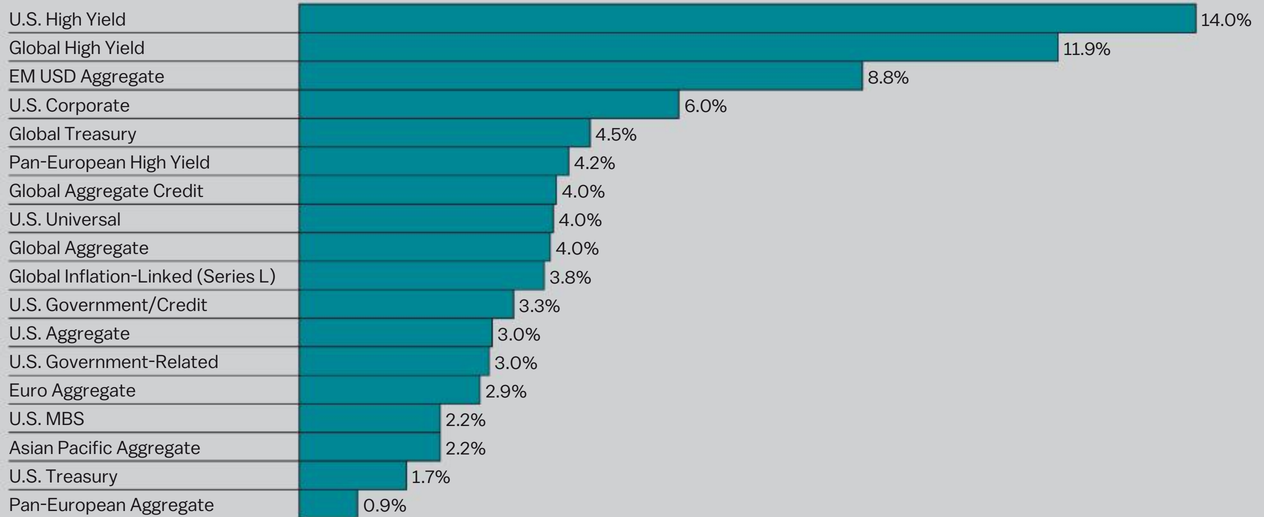
ILLUSTRATION BY LA TIGRE FOR BLOOMBERG MARKETS

6 Evaluating YTD Returns

■ The Bloomberg Barclays Global Agg was on track for its best gains since 2012—but Trump's surprise win may have changed that. Now bond markets are reassessing risks linked to the possible transition from the benefits of easy monetary policy to the potential inflationary forces of fiscal strategy. What worked for the first nine months of this year when yields were falling may need to be reexamined now that policy risks have shifted.

KEY BLOOMBERG BARCLAYS INDICES

Year-to-date return, through Nov. 15



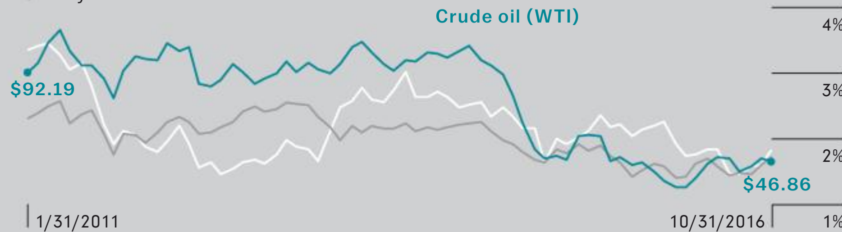
Source: {IN <GO>}

7 An Important Trifecta Finally Moves in Tandem

■ One risk to bond markets is complacency, as the sizable move in yields is supported by inflation expectations, rising commodity prices, and the potential for fiscal stimulus. Consensus expects the Fed to raise rates in 2017 by the most since 2004 following almost seven years of easing. History shows that moves this significant often accompany changes in fixed-income portfolio repositioning as investors shorten duration and move into floating-rate products.

BONDS, INFLATION, AND OIL

10-year Treasury yield
10-year TIPS inflation breakeven



Source: {BI STRTN <GO>}

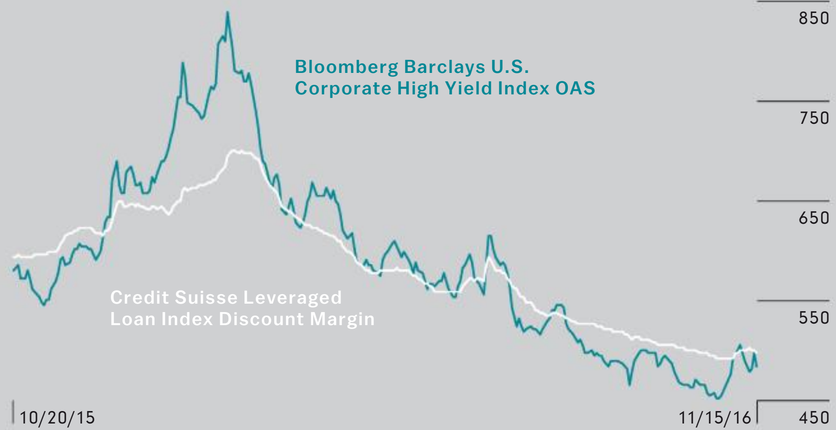
8 A Key to Optimization

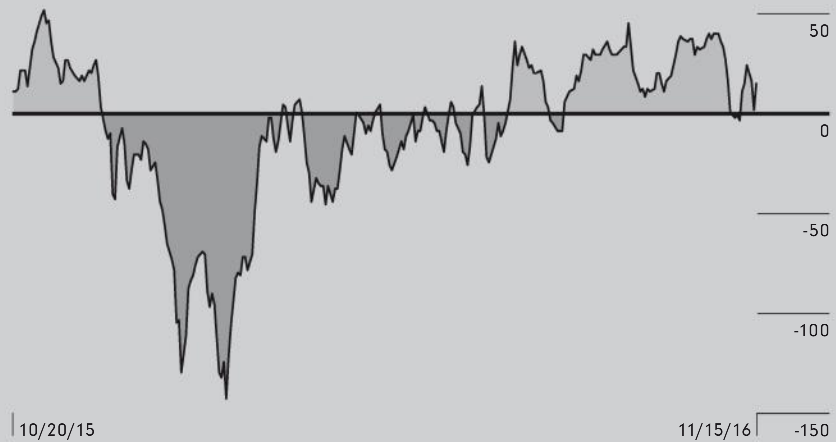
■ Optimizing excess return is critical to bond outperformance as interest rates rise and the yield curve steepens. While the Bloomberg Barclays U.S. Corporate Bond Index has lost 3 percent on a total-return basis from Aug. 1 through Nov. 15 because of a loss of 4.6 percent from higher rates, it's gained 1.6 percent on an excess-return basis relative to Treasuries as spreads have tightened. Should the move to higher interest rates prove sustainable, the shift will bring about the repositioning of duration, currency, and credit risk across fixed-income markets.

9 Better Than Junk: Higher Rates Don't Bother Leveraged Loans

■ Leveraged loans are less hurt by rising rates than high-yield bonds, because they usually mature or are refinanced within three years, while junk bonds have longer durations. Loan coupon payments also adjust when London interbank offered rates move above predetermined floors, unlike fixed coupons on high-yield securities, which hurt bond prices when rates rise. In terms of valuation, leveraged-loan spreads are as wide relative to high-yield bonds as they've been in 12 months.

LEVERAGED-LOAN SPREADS EXCEED HIGH YIELD





Source: {BI STRTN <GO>}

10 A Sector to Watch

■ Financials tend to do better when interest rates rise and the yield curve steepens, because they can charge more for loans while more slowly adjusting deposit rates. This is why yields on nonfinancial corporate bonds have risen more than yields on similarly rated financial bonds over the past few months.

11 Float On

■ Floating-rate notes have credit risk but not interest rate risk, because the spread is reset above a variable-rate coupon (usually three-month Libor). Corporates have issued almost three times as many floaters this year as last year, with financials issuing more than 90 percent of all floaters this year.

12 From the Vault

■ History shows that in fixed income, offerings that have shorter durations outperform when interest rates rise. Bonds issued by banks, floating-rate notes, and leveraged loans all deserve a look because they have shorter durations than traditional fixed-rate corporate bond alternatives.

ILLUSTRATION BY LA TIGRE FOR BLOOMBERG MARKETS

40

Our U.S. CLO new issue market share has increased more than 400% since 2012 based on strong demand for Fitch ratings by over 80 loan managers.

Fitch rated 65% of new issue U.S. CLOs in 2015 and our share of European CLOs has been averaging over 70% for the past three years. Our leveraged finance team that includes seasoned Structured Credit and Corporates analysts is what makes Fitch unique. Our research and ratings reflect a complete view of leveraged loan credit risk.

For a complete credit view, ask for Fitch.

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The Markets Q&A

Jack Bogle: "We're in The Middle of a Revolution"

By MICHAEL REGAN

PHOTOGRAPH BY LARRY FINK

JOHN "JACK" BOGLE wrote his Princeton senior thesis in 1951, arguing that mutual funds "may make no claim to superiority over the market averages." Sixty-five years later, the Vanguard founder is still being forced to defend his argument—perhaps now more than ever. ¶ When Bogle started the first index fund in 1976, his goal was capturing the overall market's return at much lower costs than the stockpicking fund managers who so often failed to match it. The wisdom of this passive approach has become so conventional that Vanguard's assets under management have swollen to $3.5 trillion, mostly in index funds. ¶ While Bogle, 87, has long been retired as head of Vanguard, he can still be found there in an important research and advocacy role—keeping alive the revolution he fomented decades ago. He has no shortage of critics. Indexing, after all, has caused higher-priced active managers to hemorrhage hundreds of billions of dollars. Some naysayers have gone so far as to say that "passive investing is worse than Marxism"; others toil away trying to make a better mousetrap. Even Vanguard's mutual ownership—in which profits are returned to its clients to keep costs low—has been attacked in court by a whistle-blower who says the company owes tens of billions of dollars in taxes. ¶ Yet as Bogle makes clear in this interview, he continues to defend his thesis with the passion of a college kid: "The math is the math," he says.

MICHAEL REGAN: You started the first index fund at Vanguard in 1976. How'd you celebrate its 40th anniversary?

JACK BOGLE: We had a lunch gathering for the underwriters just recently. They were the kings of the world in those days. At lunch one of the underwriters said he remembered thinking, "We can do $250 million on this!" Before long it became, "$200 million seems like something we can do!" Then maybe $150 million or $100 million. Later it was, "We're still trying to get to $50 million." And, at the end, "We're hoping for $25 million." Finally the check arrives: $11,300,000. And he brought up this paradox, that what may well be the worst underwriting in the history of Wall Street turned out to be, 40 years later, the most powerful idea in finance—one that's reshaped the entire industry. "Let's get together again 10 years from now," he said. And I replied, "What do you think about five?"

MR: A lot of people now use index funds, either yours or those of your competitors, but it's still a fraction of the overall pie. How do you see the trend progressing from here?

JB: What's clear is we're in the middle of a revolution caused by indexing. It's reshaping Wall Street, it's reshaping the mutual fund industry. And it's doing something very simple: shifting the allocation of stock market returns away from Wall Street and toward Main Street. We're beyond the beginning, but nowhere near the end.

MR: I want to play devil's advocate. The pendulum seems to have swung so far that there is, to some extent, almost a backlash against indexing. Has any of that resonated with you?

JB: I've been in this business for 65 years. I've seen more pendulums. Every one swings back and forth, and the further it goes left, the further it will go right. So pendulums are there, and they can be scary when something gets very popular. But this isn't a pendulum anymore. People are going to be using more index funds in 2025 than they are today. This is an underlying, fundamental trend—not one built on opinion, but on the relentless rules of humble arithmetic.

MR: Take us back a bit. How did the fox get into the henhouse?

JB: My Princeton senior thesis got me a job with Wellington Management. Mr. Walter Morgan said hiring me was the best business decision of his life. Wellington was an industry leader managing about $150 million—not a lot of money, although it seemed like a lot at the time. This industry was very simple back in 1951. The dominant funds looked pretty much like the Dow Jones average. They were middle-of-the-road, large-cap funds. I looked at them, casually, while working on my thesis—I had no access to computers or anything—but I looked at the records of this handful of funds, and they had pretty much the same records. They didn't seem to be able to beat the Dow. Well, then I got into the business working for Wellington and I didn't think much more about it. You come out of college, you don't really know very much. I did anything Mr. Morgan wanted me to do, including hanging pictures where he said to hang them. Later on I was able to decide where they went. We had a wonderful relationship. Not really all that close, but certainly mutual admiration and respect. He saw something in me that he liked. It's kind of weird that I considered myself a totally normal person without a lot to bring to the table—probably above-average intelligence, but not a lot above average. And here I am in this funny position today of being this bomb-throwing, Marxist revolutionary.

MR: Is that how you view yourself? That's how some people view you, of course.

JB: Actively managed funds have been losing to index funds, in terms of cash flow, for eight consecutive years now. And it's cascading now. Investors love it; Wall Street hates it. Mutual fund managers don't like it either. Money is leaving them and coming to us every single day. We're now doing a billion dollars a day. This is just totally beyond anything else in the industry right now.

MR: A billion dollars a day?

JB: I should mention, my wife and I left a little cocktail party recently, and she said, "You know, I don't like it when you talk about business, and I really don't like it when you brag about bringing in a billion dollars a day." "Sorry that you missed the first part of the conversation," I said. "I wasn't bragging about it, I was complaining about it." Vanguard manages $3.5 trillion, which is a nice measure of how much people love us, as is a billion dollars a day. But I was never in this business to be big. I'm a small-company guy.

MR: Back to you being a bomb-throwing Marxist. A Sanford C. Bernstein strategist, Inigo Fraser-Jenkins, caused quite a buzz with a note he published in August titled "The Silent Road to Serfdom: Why Passive Investing Is Worse Than Marxism." One thing he says is that the rise of indexing could cause stocks to move in the same direction more often: "If correlation of stocks increases," he writes, "then that impedes the efficient allocation of capital." How do you respond to that?

JB: Well, you certainly don't have to worry about what he's writing. I mean, that's a piece of work.

MR: You've read the report?

JB: I glance at anything favorable to indexing; I pore over anything unfavorable. You don't need people to tell you you're right all the time. You need people to tell you that you're wrong. But this was an absurd paper. First, take the simple part. The stock market has nothing—n-o-t-h-i-n-g—to do with the

“The math is the math, and I think the mathematics are inarguable”

allocation of capital. All it means is that if you’re holding General Motors, say, you’re holding General Motors. Capital isn’t allocated—the ownership just changes. I may be an investor, you may be a speculator. But no capital goes anywhere. This is basically a closed system. You have new IPOs and whatnot, but they’re very small compared to this vast thing we call a market, which is now around $24 trillion. The allocation of capital? That’s just nonsense.

MR: And the correlation of stocks?

JB: There is some evidence that the correlation of stocks, which has always been very high—something like 65 percent, maybe 70 percent now—could very well be caused by indexing. But so what? The efficient market theory ignores the fact that for every buyer there’s a seller. I don’t know why we can’t get this through people’s heads. Cliff Asness is the one who got everything right. He’s one of the smartest guys in the business. One of his headlines was, “Indexing Is Capitalism at Its Best.” I’ll let him be the defender of that, but this Bernstein note was just a sensational thing. It’s a bit like asking your barber if you need a haircut: He has a vested interest in this.

MR: Could you take us through how Vanguard emerged from the ashes of a failed merger after Wellington struggled in the go-go era of the 1960s?

JB: Along comes this little Boston advisory firm, Thorndike, Doran, Paine & Lewis, which manages a fund called Ivest—a go-go fund with a hot, if dubious, record. It really was a little bit of thin air. And they also offered these “brilliant investment managers,” put that in quotes. So the Wellington Fund merged with the Ivest Fund. It worked perfectly, but only until it didn’t. The first five years you would have described Bogle as a genius. And at the end of the first 10 years, roughly, you would have said: the worst merger in history, including AOL and Time Warner. It all fell apart. Their management skills were zero. They ruined the fund that started Ivest. They started two more and ruined both. And they ruined Wellington Fund. The company started to shrink radically, and they who had done the damage decided to fire me. I told the board the best thing for us to do is to unscramble the omelet of all those years ago and give them back their counseling business. The funds business is worthless, and we’ll buy ’em out. That proved to be much too much for the directors to follow, but they were willing to say “give us some options of what we can do.”

MR: And a startup was born.

JB: I called the new firm Vanguard. It comes from naval history: the Battle of the Nile, one of the great victories of all time, with the British sinking the French in Aboukir Bay. There was a dispatch in there by Admiral Horatio Nelson off the deck of *HMS Vanguard*.

MR: I have to ask. Here we are a short march from Valley Forge, Pa., and you have a firm that’s a tribute to the British. Am I reading too much into that?

JB: Yes, and people have made that comment before. The British thing comes from Wellington and my desire to honor my great mentor, Mr. Morgan, who was a great history buff. I thought he would like the name. Anyway, we were barred—to avoid conflict from the people who’d just fired me—from going into investment management or into shared distribution. Yet in two years we’d done both.

MR: How did that happen?

JB: I could see what a tough business this was to win at, and that old idea of an index fund came to mind. And it came to mind particularly because when Vanguard started—we incorporated on Sept. 26, 1974—we were right at the bottom of the market. *The Journal of Portfolio Management*’s first issue came out featuring a piece by Paul Samuelson, the first American to win the Nobel Prize for economics, titled “Challenge to Judgment.” There’s no brute evidence to show that investment managers can beat the S&P 500, he said, so why doesn’t somebody start an S&P 500 index fund? I read that a couple weeks after Vanguard started and thought, You know, there’s an idea. And it ended up being an easier sell than you’d think. The board was still divided and probably tired of controversy. They’d had enough. When I presented it to them, of course they said, “You’re not allowed to get into investment management.” But I said, “This isn’t managed, it’s an index fund.” You’re laughing!

MR: Genius…

JB: And believe it or not, they bought it. I think they figured, "This won't amount to much, let's throw a little candy to Bogle." Plus, I had the intellectual backing of Paul Samuelson, and you don't say, "Who is Paul Samuelson?" He was a wonderful, insightful guy with a great sense of humor, and obviously a genius. He later wrote this great endorsement of the fund in *Newsweek*, and in the rare instances we were together, I was totally intimidated. So the board bought it. We had the underwriting, which I described…and then not much happened for quite a few years. The second index wasn't created until 1984, by Wells Fargo. In this industry, if someone perceives a good idea, it's copied faster than you can imagine. Sometimes I think the copies get filed with the SEC before the original does. Anyway, indexing ultimately proved to be a fantastic idea—in part because it's very difficult for investors to get disappointed in it.

MR: Is it a problem if indexing gets to 100 percent?

JB: It's 10 to 15 percent now, and it could easily get to 50 percent. The example I use is stock market turnover, which has run between 150 and 250 percent of late. If we went from no indexing in this theoretical thing to half indexing, say, the turnover would be 125 percent. You might just immobilize half of the market. For decades the turnover was 25 percent a year, not 125 percent. We don't need all that turnover, but we have a brokerage business in which turnover generates the returns that the brokerage business earns. And, as everybody knows, if a salesman sells nothing in a month, he brings home nothing—so he has to sell something. He has to believe what he's doing is right. And he may be doing what's right, but as a rule he can't be doing what's right because there's someone on the other side of every trade. And all that trading means zero until the croupier in the middle puts his rake down on the table and scrapes off his share of the winnings. Wall Street is a casino, that's a fact.

MR: And the house always wins. So how does this play out for active managers?

JB: I don't know what it will take to get inefficient, but they say if it gets inefficient then active mangers will win. If indexing gets to 80 or 90 percent, I think that's probably pretty fair. But for every active manager who wins, there will be an active manger who loses at the same amount. It's symmetrical. It has to be except for the costs in the middle. Indexing is the way. The math is the math, and I think the mathematics are inarguable. Just don't take anything for granted if you're an investor.

MR: Index funds can't be expected to study every proxy resolution. The knock is that too often index funds will vote the way management wants them to vote. Is that a danger as the percentage of a company owned by an index gets higher?

JB: If that situation were to remain, it wouldn't be good. As Bob Monks, the wonderful reformer in this area, said, "Capitalism without owners will fail." Leo Strine, the chief justice of Delaware's supreme court, says we have a situation of ownership without owners—and that has been largely true, not entirely, but enough to make the statement pretty accurate. Curiously enough, I wrote about this in my Princeton thesis. Can you believe that?

MR: You're still defending it, 65 years later.

JB: I have a chapter that concluded, "I expect mutual funds to live up to this responsibility and become much more active in the future." And nothing happened. Oh, callow youth! Oh, boyish idealism! We totally failed to live up to that as an industry. There's no question part of it is that we didn't confront big issues. The ownership has changed and grown, and we have to bring the system in line with making sure the fundamental task is very simple: Corporations should be run in the best interest of their shareholders and not their management.

MR: What's the way forward for index funds if this threat continues?

JB: To me, index funds haven't been the problem but the solution. The old Wall Street rule was, "If you don't like the management, sell the stock." The index funds can't follow that rule, so there's only one rule left: "If you don't like the management, fix it." Vote, talk, discuss, cajole, applaud—and that's actually starting to happen in a major way. Earlier this year, a very distinguished group of people, including Jamie Dimon and Warren Buffett, came out with "Commonsense Corporate Governance Principles." That's not the conclusion, but it's a good beginning.

MR: What about so much power being concentrated in so few index providers?

JB: There's a brilliant academic article by three Dutchmen about that. They talk about the implications of having three institutions—Vanguard, BlackRock, and State Street—dominate index investing. At some point these funds are going to have to worry about the fact that the Investment Company Act of 1940 says—and I'm paraphrasing here—mutual funds can't own more than 10 percent of the stock of any company. So we're going to get up to 10 percent, and the question will be, Is it the individual mutual fund? If it's fund by fund, we could theoretically have six funds that each owned 10 percent of General Motors. Regulators will have to think about that, because there's such a thing as too much concentration. Where the shovel breaks, as they used to say, I don't know. I'm sure there's a discussion of that at Vanguard, even though I'm not part of it. I'm very happy with the way our management is performing, particularly CEO Bill McNabb. He has to worry about a business. And I only have to worry

about ideals. So sometimes our views aren't totally the same, but I think, in general, we care about the same underlying principles deeply.

MR: Is it easier to focus on the ideals when you don't have to run a business?

JB: Oh, you're damn right. You can say anything. But I try and stay within the rules. I don't need people to read what I'm saying and go, "That's different from what Vanguard believes." What Vanguard believes is how this company is going to run. It doesn't matter what I believe. I sit here, pretty independently, in the Bogle Financial Markets Research Center. We're three people cranking out an enormous volume of work.

MR: How much satisfaction in your life comes from ideas, and proving them in practice, rather than padding your own pocket?

JB: Let's leave the "rather than" out for a minute. I've always been intrigued by intellectual ideas. They call it intellectual curiosity—I don't know why they don't just call it curiosity. This is kind of a self-serving comment, I admit, but I've written 10 books. They're getting pretty close to a million copies.

MR: You need to get Hollywood interested in the movie rights.

JB: Yeah, and get Robert Redford to play me. He's aging a little bit—and I'm not, of course. Now, when you get into wealth, you're correct that I never really thought a lot about it. I keep reading that I gave up billions. That's an interesting comment, and I honestly don't think it's true. Vanguard's success is having the returns go to the shareholders and not to me. So if I said I want all those returns, we wouldn't be this size, we wouldn't be worth billions. There isn't much of a question that we created a very valuable company. But the value goes to the shareholders and the funds. I've always said ideas are a dime a dozen, but implementation is everything. There's not much question I had two great ideas: mutuality for the structure, indexing for the strategy.

MR: Everyone focuses on indexing as the innovation. Is there not enough focus on the structure, the idea that the company's profits go back to the clients who are also the owners?

JB: I'd say not nearly enough. It's a huge cost advantage. Here's the evil thing about this business: Public ownership is the antithesis of fiduciary duty. You've got two masters to serve when that's the case.

MR: The mutual ownership has caused some legal challenges. A former Vanguard tax lawyer has alleged that by not charging as much as competing for-profit mutual fund managers do, the firm has avoided paying taxes on the hypothetical profits it would've accumulated if it did. One estimate is that Vanguard owes the IRS $34.6 billion in back taxes for the years 2007 to 2014. If you were called to testify in this case, what would you tell the court? Does Vanguard owe the U.S. $34.6 billion?

JB: I want to make it very clear—I don't speak for Vanguard, and I'm not particularly familiar with the litigation. What I'm doing here is just speaking for myself. No. 1, here's a structure that's stood the test of time for pretty close to 42 years without challenge. Indeed, the SEC, in approving the Vanguard plan to operate, described it as "consistent with the provisions, policies and purposes" of the '40 Act. "It actually furthers the Act's objectives... and promotes a healthy and viable mutual fund complex in which each fund can better prosper." That's such a good endorsement that we printed it in annual reports. I would think it's absurd that there's even a remote possibility that some court's going to say we owe $34.6 billion.

MR: Let's talk about the Department of Labor's fiduciary rule, which will soon require broker-dealers and advisers to take clients' "best interests" at heart in regards to retirement accounts—unless a President Trump moves to repeal it, as some expect. What's your pitch to him in the Trump Tower elevator?

JB: I'm happy to have the fiduciary rule, but think about this for a minute: It doesn't really matter in the long run whether there's a fiduciary rule or not. With each passing day, shareholders get better educated, and they will move their money to people doing things right and serving them properly and away from people who are doing it wrong. That is crystal clear to me. I think we need the rule, but if the rule goes, we will fall back on the very essence of capitalism. What Adam Smith wrote way back in 1776 in the *Wealth of Nations*: The sole role of the producer—or money manager, in this case—is to serve the consumer.

MR: Something I find interesting that I don't think a lot of people realize about index funds is securities lending, or loaning shares to short sellers and then charging them a fee. That's another trick to keep the fees down on index funds. How did that come about, and did you ever have any qualms about that?

JB: When I was running Vanguard, securities lending wasn't anywhere near as pervasive as it is today. I have to say, I don't proclaim any expertise of what's going on out there today. I do know, however, this simple fact: Vanguard's fees, all of them, go back to the fund. At most other firms, the manager keeps a half, a third, or maybe a quarter, and none of it goes back to the fund. That seems irresponsible. Whether the manager should get anything—maybe a tenth would be fair?—I just don't know.

MR: Do you have any regrets about your approach to the ETF business?

JB: First, let me make an important distinction here between the traditional index fund and the ►

“If you put nothing away for retirement, I can tell you, to the last penny, how much you will have when you retire: nothing”

exchange-traded fund. What I started in 1976 are based on very broad market segments, operated with low turnover, low cost, and held by an investor forever. That’s the traditional index fund. We have almost 80 percent of that market. Now the ETF is a very different business. It doesn’t need to be, but it is. It turns out to be a trading business. We could’ve launched the first one at Vanguard, but I turned it away. People have said I must be the stupidest person in the world. I don’t feel stupid. You stand up for your principles. We’re doing fine without it, and we started our own ETF business that sells in a different way than most firms in the business, and I think a better way because we emphasize long-term funds. We don’t have a fruit-and-nut fringe in our ETF business. We’re not focused on market timing, or figuring out if the market is going up or down and giving you that return times three—that doesn’t have anything to do with long-term investing. It doesn’t really have anything to do with speculation, either. It has to do with gambling.

MR: Your outlook is that we have pretty high valuations, very low interest rates, and very low growth. That makes for pretty measly returns—maybe low single digits—in the near future. Is that an invitation for people to start chasing performance and making risky investments to juice returns?

JB: Let’s say trading costs you a couple percentage points a year on your return. The future market return on stocks is going to be 5 percent. That 2 percent is 40 percent of them. It matters. Just mathematically, trading is going to be even more shunned in an era of low return. Trading can never enrich investors as a group, because—I’m glad you’re sitting down—there’s someone else on the other side of every trade.

MR: Well, everyone thinks they’re on the right side.

JB: Great markets don’t go on forever. We’re certainly looking at an era of much lower returns. I don’t think 4 or 5 percent for stocks is a bad guess. You might get lucky and get 2.5 percent on bonds and maybe almost 3 percent if you get into some corporates. But you put the 5 and the 3 together, and you have a 50-50 balanced fund, that’s 4 percent for a balanced portfolio. Then you take out inflation—say we’re lucky enough to have 1 percent. I don’t think we’ll get that lucky, but it should be lower than in the past. Maybe it’s a 3 percent real return? Then you have your friendly mutual fund managers taking 2 percent. Easy math.

MR: What do you think of robo-advisers?

JB: I think their time is here. In a world where you’re picking stocks, this wouldn’t work at all. In this new world of indexing, where you’re selecting asset market sectors—usually big market sectors—I think robo-advisers are in a position to do it right. Shops like Betterment are doing basic allocation using Vanguard funds. I don’t think robo-advisers can add a lot of value, but for investors who need a helping hand, I think it’s good and fairly priced. I happen to think our way of doing it at Vanguard is better, but it’s more expensive—and you’ve got a live body, or at least the availability of one. It’s going to make it tough on brokers and registered advisers, though.

MR: Something else that’s creating some buzz is impact investing, or ESG [environmental, social, and governance]. I’m curious what you think about it?

JB: I’m very much on the ESG bandwagon. I believe companies should be way more sensitive to these issues. I don’t know exactly how to measure any of it, though. And what do you do about a company that has good social values but bad environmental values? Or Berkshire Hathaway, with its governance model? They’re well-governed, so no simple thing gives you an answer to a complex situation. So while I like the idea of ESG, it’s still pretty fuzzy. And if you don’t run a business, you won’t do any good for anyone at all—it can’t be at the expense of doing business well.

MR: How did Trump’s election change your outlook?

JB: It’s going to be a long, long road. I am hoping that, when confronted by the responsibility of walking into the White House with the enormity of his responsibilities, I’m hoping he will be Saul on the road to Damascus. That’s a little Biblical reference to when Saul had his complete conversion to Christianity.

I don't know how likely that is, or whether you can really change that inner man that we've seen too much of. Even more important, in the long term this nation will be deeply hurt by the failure to be the nation we've always been, which is a place everyone else in the world wants to come. Walls make no sense. Any substantial reduction in our trading with the rest of the world has negative effects—on our society, our economy, and our markets. All these things are negatives. And these are things that are part of his platform that he's going to have to move away from. There's a chance he will. Whether he'll be Saul on the road to Damascus is another question.

MR: What other issues have your attention?

JB: I would be appalled if they did away with the inheritance tax. Of all the useless changes that help only a tiny percent of Americans, what is the point? It's almost sick to think about eliminating the inheritance tax.

Infrastructure has to happen. We can borrow now at low rates. But how much debt can we handle? One of the problems with our great republic is that it's so easy to borrow in the short term. So easy. Imagine a platform that says we're going to fix everything that's broken in the U.S.? And we're going to give you a tax cut to boot. I mean, the cheering would go on forever. Those are short-term effects, and the Congress being the Congress, and the market being the market, they will look at those short-term effects very positively. Now whether we can get the Chinese to buy more long-term bonds, I don't know.

Social Security has to be fixed, too. It's a political problem, not an economic one. Congress is just going to have to make sure it works mathematically.

MR: Do you feel like your accomplishments exceeded your ambition, or were you always confident?

JB: I was never the type who had a particular ambition. I had friends in college who would say, "I want to be a vice president by the time I'm 35 years old." A lot of people had these career plans. I didn't have any. I thought if I did my best, good things would happen. I could've gone to work for the Philadelphia Bank—it's long gone—where I had a nice job offer: $250 a month, the same amount as Mr. Morgan paid me. It sounds small now, but that was the going rate when you were a college graduate.

I do want to say that another really great part of my life has been working with young people. I've had about 150 students on my scholarships at Blair Academy and another 150 on my scholarships at Princeton. This present generation, they're bright. I mean, they're unbelievable.

MR: Is there a difference between them and past generations, or is it just that optimism of youth?

JB: Well, certainly they're smarter. Certainly they're more internationally minded. Certainly they're less personal wealth-oriented. They're happy to have their wealth be accomplished with what they have in their pocket. These are generalizations. They're just great young men and women.

MR: You sound optimistic. Is there anything you're worried about that the rest of us need to look out for?

JB: Sure, the stock market isn't cheap, and so I worry about that. Cash is so hopeless that you almost can't afford not to invest, but you've got to be fairly conservative. I wouldn't go long on the interest rate side. I would personally maybe go half long, half intermediate. And in the long run, longs will do better because their interest is higher. So we have market risk, and then we have all the other risks: war, religious uprisings, nuclear weapons, disease, global warming. We live in a risky world. But you have to invest. If you put nothing away for retirement, I can tell you, to the last penny, how much you will have when you retire: nothing.

MR: I just remembered another anniversary you celebrated this year: your heart transplant. Still tickin' 20 years later?

JB: I have problems with it every once and a while, but it's still tickin'.

MR: How are you feeling otherwise?

JB: I don't get around as well as I used to. Traveling is really getting difficult. Just getting through the airport is tough. My wife made me take a wheelchair last time. I buried my face in my hands so no one would recognize me. But I really feel, more so than in quite a while, pretty good about my life. We also celebrated our 60th wedding anniversary this year. I have a wonderful wife, six kids, 12 grandchildren, three great-grandchildren. There's no perfection in family life, and certainly we aren't perfect, but we're probably about as close as we can be. I almost hate to say how proud I am of my career and, most of all, helping folks get the returns they deserve. And that's what these people are saying in these letters I get almost every day.

MR: Do you still respond to every one?

JB: Every single one. I love it, but it's hard to get it all done. I find myself doing my e-mail on Saturdays.

MR: What's one of your favorite letters?

JB: One of the nicest was from an airline pilot who had retired. My advice to investors is just to throw their 401(k) statements into the wastebasket. Don't peek. Open the envelope when you retire and have a cardiologist standing by, because you're going to be totally amazed. "Dear Mr. Bogle," this pilot wrote me. "I peeked. And all I want to do is thank you."

Regan is a senior markets editor at Bloomberg News in New York.

Inside a Moneymaking Machine Like No Other

The Medallion Fund, an employees-only offering for the quants at Renaissance Technologies, is the blackest box in all of finance

By KATHERINE BURTON

ILLUSTRATION BY MARTIN ANSIN

SIXTY MILES EAST of Wall Street, a spit of land shaped like a whale's tail separates Long Island Sound and Conscience Bay. The mansions here, with their long, gated driveways and million-dollar views, are part of a hamlet called Old Field. Locals have another name for these moneyed lanes: the Renaissance Riviera.

That's because the area's wealthiest residents, scientists all, work for the quantitative hedge fund Renaissance Technologies, based in nearby East Setauket. They are the creators and overseers of the Medallion Fund—perhaps the world's greatest moneymaking machine. Medallion is open only to Renaissance's roughly 300 employees, about 90 of whom are Ph.D.s, as well as a select few individuals with deep-rooted connections to the firm.

The fabled fund, known for its intense secrecy, has produced about $55 billion in profit over the last 28 years, according to data compiled by Bloomberg, making it about $10 billion more profitable than funds run by billionaires Ray Dalio and George Soros. What's more, it did so in a shorter time and with fewer assets under management. The fund almost never loses money. Its biggest drawdown in one five-year period was half a percent.

"Renaissance is the commercial version of the Manhattan Project," says Andrew Lo, a finance professor at MIT's Sloan School of Management and chairman of AlphaSimplex, a quant research firm. Lo credits Jim Simons, the 78-year-old mathematician who founded Renaissance in 1982, for bringing so many scientists together. "They are the pinnacle of quant investing. No one else is even close."

Few firms are the subject of so much fascination, rumor, or speculation. Everyone has heard of Renaissance; almost no one knows what goes on inside. (The company also operates three hedge funds, open to outside investors, that together oversee about $26 billion, although their performance is less spectacular than Medallion's.) Apart from Simons, who retired in 2009 to focus on philanthropic causes, relatively little has been known about this small group of scientists—whose vast wealth is greater than the gross domestic product of many countries and increasingly influences U.S. politics[1]—until now. Renaissance's owners and executives declined to comment for this story through the company's spokesman, Jonathan Gasthalter. What follows is the product of extensive research and more than two dozen interviews with people who know them, have worked with them, or have competed against them.

Renaissance is unique, even among hedge funds, for the genius—and eccentricities—of its people. Peter Brown, who co-heads the firm, usually sleeps on a Murphy bed in his office. His counterpart, Robert Mercer, rarely speaks; you're more likely to catch him whistling *Yankee Doodle Dandy* in meetings than to hear his voice.[2] Screaming battles seem to help a pair of identical twins, both of them Ph.D. string theorists, produce some of their best work. Employees aren't above turf wars, either: A power grab may have once lifted a Russian scientist into a larger role within the highly profitable equity business in a new guard vs. old guard struggle.

For outsiders, the mystery of mysteries is how Medallion has managed to pump out annualized returns of almost 80 percent a year, before fees. "Even after all these years they've managed to fend off copycats," says Philippe Bonnefoy, a former Medallion investor who later co-founded Eleuthera Capital, a Switzerland-based quantitative macro firm. Competitors have identified some likely reasons for the fund's success, though. Renaissance's computers are some of the world's most powerful, for one. Its employees have more—and better—data. They've found more signals on which to base their predictions and have better models for allocating capital. They also pay close attention to the cost of trades and to how their own trading moves the markets.

But as computing power becomes ever cheaper and competitors sharpen their skills, will Medallion continue to mint money?

Quants seem like saviors to investors disappointed with how mere mortals have managed their money of late. In 2016 clients plugged $21 billion into quant hedge funds, while pulling $60 billion from those that do everything else. One noteworthy quant shop, Two Sigma, managed just $5 billion during the financial crisis and has seen assets jump to $37 billion. Even old-fashioned traders such as Paul Tudor Jones and Steve Cohen are adding to their computer scientist ranks in hopes of boosting returns.

Renaissance's success, of course, ultimately lies with the people who built, improved upon, and maintain Medallion's models, many of whom met at IBM in the 1980s, where they used statistical analysis to tackle daunting linguistic challenges. This is their story.

SIMONS IS ALREADY well-known: math genius, professor at MIT and Harvard, recipient of the Oswald Veblen Prize in Geometry, and co-creator of the Chern-Simons theory. He was also a code breaker for the Institute for Defense Analyses, where he worked finding messages amid the noise.

The goal of quant trading is similar: to build models that find signals hidden in the noise of the markets. Often they're just whispers, yet they'll help predict how the price of a stock or a bond or a barrel of oil might move. The problem is complex. Price movements depend on fundamentals and flows and

the sometimes irrational behavior of people who are doing the buying and selling.

Although Simons lost the IDA job after denouncing the Vietnam War in a letter to the *New York Times*, the connections he made through his work in cryptography helped create Renaissance and, a few years later, Medallion. Over the next decade, while chairing the math department at Stony Brook University, Simons dabbled in trading commodity futures. In 1977 he left academia for good to try his hand at managing money.[3]

Initially he bought and sold commodities, making his bets based on fundamentals such as supply and demand. He found the experience gut wrenching, so he turned to his network of cryptographers and mathematicians for help looking at patterns: Elwyn Berlekamp and Leonard Baum, former colleagues from IDA, and Stony Brook professors Henry Laufer and James Ax. "Maybe there were some ways to predict prices statistically," Simons said in a 2015 interview with Numberphile. "Gradually we built models."

At their core, such models usually fall into one of two camps, trend-following or mean-reversion. Renaissance's system had a foot in both. Its results were mixed at first: up 8.8 percent in 1988, its first year, and down 4.1 percent in 1989. But in 1990, after focusing exclusively on shorter-term trading, Medallion chalked up a 56 percent return, net of fees. "I was confident that the models would work better," says Berlekamp, who returned to academia in 1991 and is now a professor emeritus at the University of California at Berkeley. "I didn't think they would be as good as they were."

Eventually the scientists went so far as to develop an in-house programming language for their models rather than settle for a numbercentric option such as ASCII, which was popular at the time. Today, Medallion uses dozens of "strategies" that run together as one system. The code powering the fund includes several million lines, according to people familiar with the company. Various teams are responsible for specific areas of research, but in practice everybody can work on everything. There's a meeting every Tuesday to hash out ideas.

IN THE EARLY 1990S, big annual returns became the norm at Renaissance: 39.4 percent, 34 percent, 39.1 percent. Prospective investors clamored to get into Medallion, but the company didn't pay them much heed—or coddle clients for that matter. Bonnefoy recalls dialing a Manhattan phone number to hear a recording of the monthly returns; Renaissance's legal department doubled as unhelpful customer service representatives. (To this day the company's website, rentec.com, looks like it dates from the Netscape era.) In 1993, Renaissance stopped accepting new money from outsiders. Fees were also ratcheted up—from 5 percent of assets and 20 percent of profits, to 5 percent and 44 percent. "They raised their fees to exorbitant levels and were still head and shoulders above everyone else," says Bonnefoy, who, along with every other outsider, was finally booted from Medallion in 2005.

Encouraged by Medallion's success, Simons by the mid-'90s was looking for more researchers. A résumé with Wall Street experience or even a finance background was a firm pass. "We hire people who have done good science," Simons once said. The next surge of talent—much of which remains the core of the company today—came from a team of mathematicians at the IBM Thomas J. Watson Research Center in Yorktown Heights, N.Y., who were wrestling with speech recognition and machine translation.

In the early days of tackling these problems, computer scientists teamed with linguists and tried to code grammar. At IBM, a group including Mercer and Brown reasoned that the problems would be better solved using statistics and probabilities. (Their boss, Frederick Jelinek, liked to say, "Whenever I fire a linguist, the system gets better.") According to scientists who worked at the research center then, the team fed reams of data into its computers. Documents from the Canadian Parliament, for instance, were available in both English and French, which none of the scientists spoke. (Mercer once disappeared for several months to type French verb conjugations into a computer, according to a source.) The data allowed them to write an algorithm that found the most likely match for the phrase *Le chien est battu par Jean* was "John beat the dog." A similar approach applied to speech recognition: Given auditory signal x, the speaker probably said the word y.

"Speech recognition and translation are the intersection of math and computer science," says ▸

1
Co-CEO Robert Mercer, who backed Ted Cruz in the primary and Donald Trump in the general election, was the third-largest donor to Republican and conservative causes this cycle, doling out $22.9 million, according to the Center for Responsive Politics. Meanwhile, Simons and Henry Laufer, Renaissance's director and former chief scientist, were among the biggest supporters on the other side of the aisle, together contributing almost $30 million to Democrats.

2
In an hourlong speech Mercer gave in 2014, when accepting a lifetime achievement award from the Association for Computational Linguistics, he quipped: "This is about as much as I talk in a whole month."

3
Stony Brook would become one of his biggest beneficiaries; Simons and his colleagues have given more than $250 million to the school, which is less than 2 miles from Renaissance's 50-acre campus in East Setauket.

Ernie Chan, who worked at the research center in the mid-1990s and now runs quant firm QTS Capital Management. The scientists weren't just working on academic problems; they were also developing theories and writing software to implement the solutions, he says. The group's work eventually paved the way for Google Translate and Apple's Siri.

Mercer and Brown went to IBM's management in 1993 with a bold proposition, says a person who knows the two: Let them build models to manage a portion of the colossal company's then-$28 billion pension fund. IBM balked, questioning what computational linguists would know about overseeing investments. But the duo's fascination with financial markets was just beginning.

That same year, Nick Patterson, a former code breaker for British and U.S. intelligence agencies, joined Renaissance and approached acquaintances Brown and Mercer. "IBM was in serious trouble, and morale was poor, so it was something of a recruiting opportunity," says Patterson, who worked at Renaissance until 2001 and is now a senior computational biologist researching genetics at the Broad Institute of MIT and Harvard. The two decided to join, drawn by the 50 percent pay raise. They roomed in an attic apartment in Setauket and often dined together. When the bill came, they would pull out a special calculator that could generate random numbers. Whoever produced the higher number picked up the tab.

"Renaissance was started by a couple of mathematicians," Brown said in a 2013 conference for computational linguists. "They had no idea how to program. They're people who learned how to program by reading computer manuals, and that's not a particularly good way of learning." He and Mercer had learned how to build large systems—with many people working on them simultaneously—which was a skill set they used to Renaissance's advantage. Not that their new field was without challenges. "It's all noise in finance," he said.

More IBM veterans joined them on Long Island, including Stephen and Vincent Della Pietra, the string-theorist twins; Lalit Bahl, who had created algorithms to recognize human speech; Mukund Padmanabhan, whose specialty was digital-signal processing; David Magerman, a programmer; and Glen Whitney, who wrote software as a summer intern. "The takeaway from IBM was that the whole is greater than the sum of its parts," says Chan. "They all worked together."

Renaissance also spent heavily collecting, sorting, and cleaning data, as well as making it accessible to its researchers. "If you have an idea, you want to test it quickly. And if you have to get the data in shape, it slows down the process tremendously," says Patterson.

Cerebral challenges weren't the only incentive for Renaissance's data-hungry scientists. They also enjoyed something more intangible: a sense of family.

SIMONS WAS THE benevolent father figure. No other Renaissance senior executive has possessed his people skills, those who know him and the company say, and he inspired the supernerds to stick together. "It's an open atmosphere," Simons said in a speech at MIT in 2010. "We make sure everyone knows what everyone else is doing, the sooner the better. That's what stimulates people."

When the IBM crew arrived at Renaissance, Medallion was already producing annual returns, after fees, of at least 30 percent almost exclusively from futures trading. In the early days, anomalies were easy to spot and exploit. A Renaissance scientist noted that Standard & Poor's options and futures closing times were 15 minutes apart, a detail he turned into a profit engine for a time, one former investor says. The system was full of such aberrations, he says, and the scientists researched each of them to death. Adding them all up produced serious money—millions at first, and before long, billions.

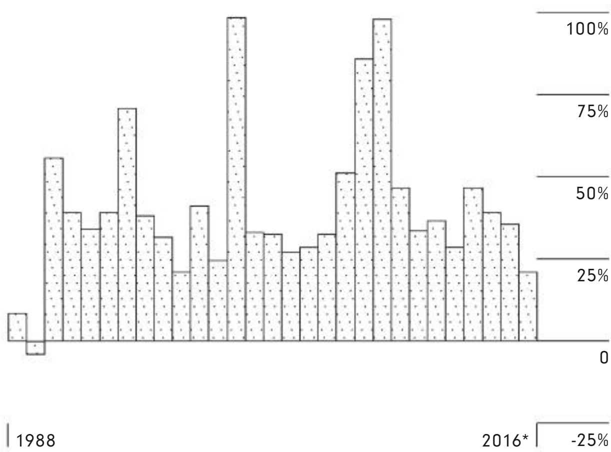
But as financial sophistication grew and more quants plied their craft at decoding markets, the inefficiencies began disappearing. When Mercer and Brown joined they were assigned to different research areas, but it soon became apparent they were better together than apart. They fed off each other: Brown was the optimist, and Mercer the skeptic. "Peter is very creative with a lot of ideas, and Bob says, 'I think we need to think hard about that,'" says Patterson. They took charge of the equities group, which people say was losing money. "It took them four years to get the system working," says Patterson. "Jim was very patient." The investment paid off. Today the equities group accounts for the majority of Medallion's profits, primarily using derivatives and leverage of four to five times its capital, according to documents filed with the U.S. Department of Labor.[4]

"You need to build a system that is layered and

4
Renaissance provided information to the Department of Labor as part of a request to change its retirement plans for employees, including putting pieces of Medallion inside Roth IRAs. That switch meant the employees would pay zero taxes—ever—on the future earnings of those portfolios, saving them many millions of dollars.

MEDALLION FUND

Annual returns since inception. A beginning balance of $1,000 would now be worth $13,830,598.



*Through June 30

Sources: Labor Department, *More Money Than God* by Sebastian Mallaby, *Investing in the Modern Age* by Rachel and William Ziemba, Internal company documents, Bloomberg reporting

layered,” Simons said in a 2000 interview with *Institutional Investor*, explaining some of the philosophy behind the firm and the Medallion model. “And with each new idea, you have to determine: Is this really new, or is this somehow embedded in what we’ve done already?” Once that’s determined, the team would figure out how much weighting to give it. Signals may eventually go cold over time but will usually be kept around because they can sometimes reemerge—or have unintended consequences if removed. A source says positions are held anywhere from seconds to seasons.

At the 2013 conference, Brown referenced an example they once shared with outside Medallion investors: By studying cloud cover data, they found a correlation between sunny days and rising markets from New York to Tokyo. “It turns out that when it’s cloudy in Paris, the French market is less likely to go up than when it’s sunny in Paris,” he said. It wasn’t a big moneymaker, though, because it was true only slightly more than 50 percent of the time. Brown continued: “The point is that, if there were signals that made a lot of sense that were very strong, they would have long ago been traded out. … What we do is look for lots and lots, and we have, I don’t know, like 90 Ph.D.s in math and physics, who just sit there looking for these signals all day long. We have 10,000 processors in there that are constantly grinding away looking for signals.”

In addition to language specialists, astrophysicists have historically had an outsize impact on the system’s success, according to people familiar with the firm. These scientists excel at screening “noisy” data. String theorists have also had a major role, and the Della Pietra brothers—who reunited with their former IBM bosses to work on equities—were the first of many with that background. The identical twins, now 56, have never strayed far from each other: They took an honors science program at Columbia University as high school students; attended Princeton as undergraduates, studying physics; and received doctorates from Harvard in 1986.

“They always sat next to each other,” says Steven Strogatz, a math professor at Cornell University who remembers them as Princeton freshmen in a junior-year-level abstract algebra class. “Their talking involved a lot of arguing. It was passionate mathematical discussion, and they were always correcting the teacher or explaining something to each other.” Chan, who worked with them at IBM, remembers them screaming at each other—but never at anyone else, to whom they were kind and humble. Their twinship added another dimension, too. “They are almost telepathic,” he says.

At Renaissance, the Della Pietras have shared adjacent offices separated by an internal window to facilitate discussion. “They are creative people and very competitive with each other,” says Patterson, to whom they reported for a time.

The IBM crew focused on improving the system’s performance and efficiency. Since Renaissance’s models were short-term oriented, they spent time looking at execution costs and researching how their trades moved the markets—a particularly difficult problem to crack, according to other quants. They also ensured that the trades and profits matched what the system had intended, since a bad price or other glitch could throw off the whole operation.

HOW MUCH MONEY an employee has in Medallion depends on his overall contribution to the firm—and collaboration is key to getting a bigger piece of the pie. Employees are awarded an allocation of shares they can buy. In addition, a quarter of one’s pay is deferred and invested in Medallion, where it stays for four years. Employees must also pay fees of as much as “5 and 44.”

Simons determined, almost from the beginning, that the fund’s overall size can affect performance: Too much money destroys returns. Renaissance currently caps Medallion’s assets between $9 billion and $10 billion, about twice what it was a decade ago. Profits get distributed every six months.

Thanks to Medallion, Simons—who still owns as much as 50 percent of the firm—has a net worth of $15.5 billion, according to estimates by the Bloomberg Billionaires Index. Laufer, who owns the next-largest ►

stake (possibly as much as 25 percent), Brown, and Mercer are among other employees worth hundreds of millions of dollars.

In some ways, money, not unlike the company's familial feel, even binds the place together. With the exception of the scientists who depart for academia or to pursue philanthropy, folks don't leave Renaissance. Why would they? The problems are complex, the colleagues first-rate, and the paychecks huge.

As everyone became rich off Medallion, lifestyles changed. Trains to Manhattan gave way to helicopter commutes. Scientists swapped Hondas for Porsches. Fancy hobbies became normal. Simons's cousin, Robert Lourie, who heads futures research, built an equestrian arena for his daughter, with arches so large that a bridge into New York City had to be shut down at night to facilitate their journey. Yachts also became a thing. Mercer has commissioned a succession of them, each called *Sea Owl*. For his part, Simons's 222-foot *Archimedes* has a wood-burning fireplace. Both vessels have a propulsion system so novel that they don't require an anchor. Always the merry ringleader, Simons planned company trips—to Bermuda, the Dominican Republic, Florida, Vermont—and encouraged employees to bring their families. Company lore is that on one of the firm's ski trips, Simons, a longtime smoker, bought an insurance policy for a restaurant so he wouldn't have to forgo his beloved Merits.

Money has also threatened to destroy the family atmosphere. In 2001, Renaissance hired a Russian scientist who, like many of his peers, came west after the collapse of the Soviet Union: Alexander Belopolsky. Patterson was against bringing him aboard, he says, because he had recently worked on Wall Street, where he had job-hopped. His fears proved prescient. In 2003 he and another Russian, Pavel Volfbeyn, announced they were leaving for hedge fund Millennium Partners, where they'd negotiated healthy bonuses and the right to keep a large part of their own profits. Renaissance sued them and Millennium, worried the researchers would take the firm's secrets with them. All parties later settled out of court.

Around that time another of Renaissance's Russian-born researchers, Alexey Kononenko, who received his Ph.D. from Penn State in 1997 and had also done a brief stint on Wall Street, was promoted within the equities group. Senior staffers ended up discussing Kononenko's advancement during one of their regular dinners at Simons's house. One person familiar with the situation says the scientists were just questioning why he had moved ahead of colleagues who had been there much longer, much the way an academic might complain about a younger colleague getting tenure. Other people with knowledge of the firm say Kononenko's promotion was a significant event in Renaissance's history and that the Russian had actually executed a power play.

Whatever the reasons for Kononenko's advancement, the outcome has safeguarded the well from which Renaissance's wealth flows: Medallion has averaged more than a 40 percent return, after fees, since the dinner.

WHEN RIVALS AND former investors are asked how Renaissance can continue to make such mind-blowing returns, the response is unanimous: They run faster than anyone else. Yet all that running hasn't always kept them on their feet when everyone else stumbled.

In August 2007, rising mortgage defaults sent several of the largest quant hedge funds, including a $30 billion giant run by Goldman Sachs, into a tailspin. Managers at these firms were forced to cut positions, worsening the carnage. Insiders say the rout cost Medallion almost $1 billion—around one-fifth of the fund—in a matter of days. Renaissance executives, wary that continued chaos would wipe out their own fund, braced to turn down their own risk dial and begin selling positions. They were on the verge of capitulating when the market rebounded; over the remainder of the year, Medallion made up the losses and more, ending 2007 with an 85.9 percent gain. The Renaissance executives had learned an important lesson: Don't mess with the models.

Another lesson may one day prove even more important: Beware of the damage others can cause. In a letter that same month to investors in his public institutional equities fund, Simons wrote: "While we believe we have an excellent set of predictive signals, some of these are undoubtedly shared by a number of long/short hedge funds."

No system lasts forever, say quants. They ask how long Medallion's magic can continue. But seven years after Simons's retirement, the fund's money-printing ways persist. Even in the first half of 2016, while many hedge funds struggled, it made more than 20 percent. Wealth and influence at Renaissance have grown apace.

Yet as successful as Renaissance has been under Brown and Mercer—who are 61 and 70, respectively—industry insiders wonder how the firm will handle its next succession. They also reserve their reverence. Take, for instance, the anecdote from an invite-only conference earlier this year. An audience member asked a panel of quant managers, "Who would be your dream hire?" After a bit of nervous laughter, one of them gave his honest answer: Jim Simons. ● *—With Pamela Roux and Zachary R. Mider*

Burton covers hedge funds for Bloomberg in New York.

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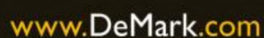

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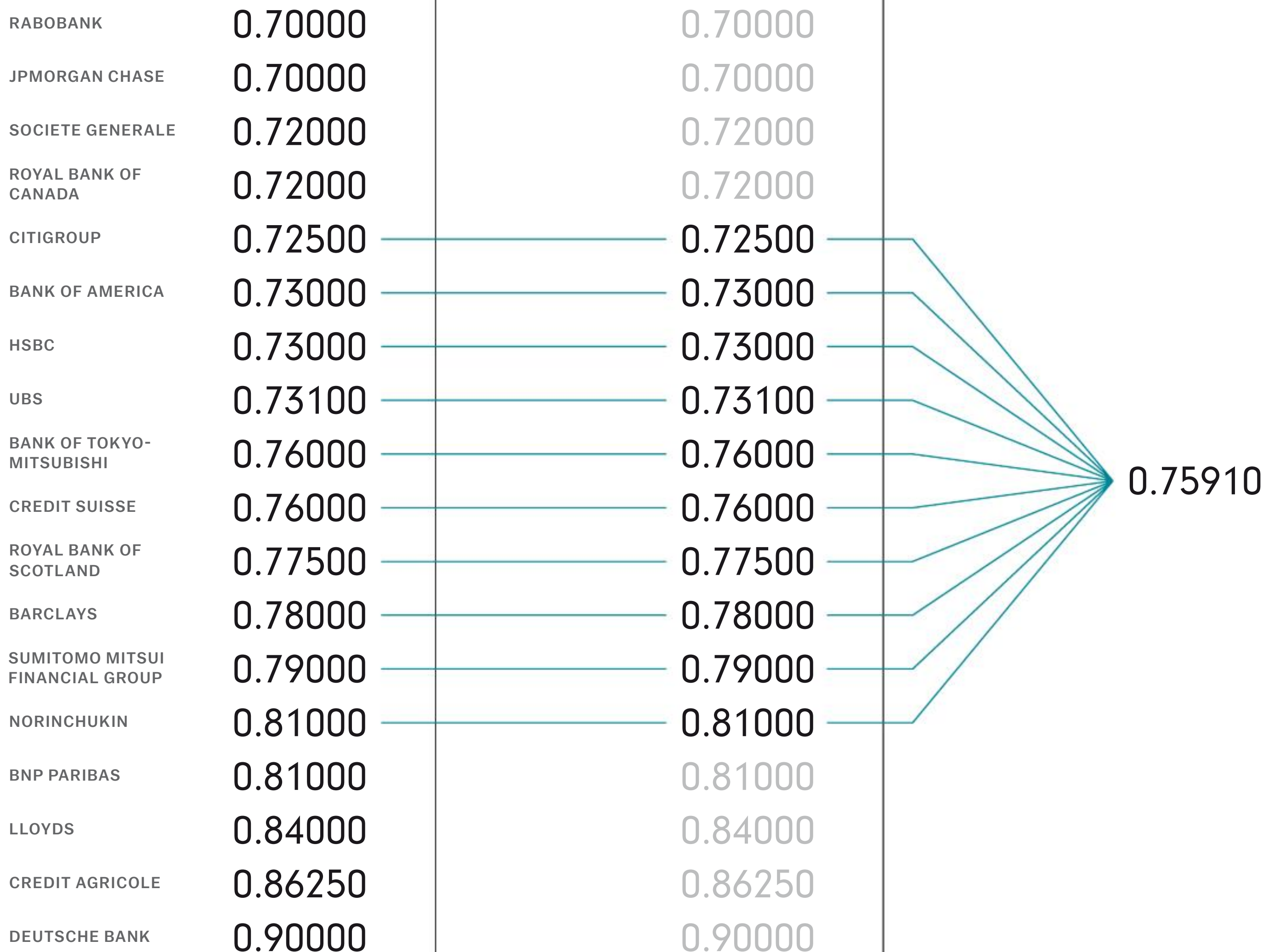
The World's Most Important Number Starts Here...

The product of a big survey and a little math, the London interbank offered rate, or Libor, helps set interest rates worldwide, affecting the price of more than $300 trillion in mortgages, loans, and derivatives. The benchmark became notorious in 2012, when regulators revealed a financial scandal of epic proportions.

Every morning, a group of banks from around the world submits estimates of the lowest possible interest rate at which the institutions can borrow money from another bank on that day. There are five panels, each for a different currency, and every panel produces a rate for seven maturities, for a total of 35 rates a day.

Below are the rates submitted on July 29 for U.S. dollar-denominated loans with a three-month maturity. The top and bottom quarter of submissions are discarded to avoid outliers. There were 18 contributors, so the highest and lowest four were cut.

The average of the remaining banks' submissions is calculated. For 24 hours, that's Libor.



... But Really, The Story Begins With This Man

By GAVIN FINCH and LIAM VAUGHAN

PHOTOGRAPH BY ANDREA FRAZZETTA

Despite its ubiquity, few outside the world of finance had heard of Libor until regulators found that a dozen banks—Barclays, UBS, and Citigroup among them—had colluded to manipulate the benchmark interest rate and fined them $9 billion. The scandal was personal for 90-year-old Minos Zombanakis, who watched the concept he created in the 1960s morph from a respected pillar of the global financial infrastructure into a byword for greed and corruption. In this excerpt from Gavin Finch and Liam Vaughan's forthcoming book about the Libor scandal, The Fix *(Wiley, December 2016), the journalists trace the roots of this mysterious number.*

IN 1969, NEIL ARMSTRONG walked on the moon, Richard Nixon became president of the U.S., and 400,000 hippies descended on a sleepy New York farm near Woodstock. On the other side of the Atlantic, on a winter's day in London, a mustachioed Greek banker named Minos Zombanakis was taking his own small step into history. He'd hit upon a novel way to lend large amounts of money to companies and countries that wanted to borrow dollars but would rather avoid the rigors of U.S. financial regulation.

As the sun set over the rooftops of London's West End, Zombanakis was standing by his desk in Manufacturers Hanover's new top-floor office, drinking Champagne and eating caviar with Iran's central bank governor, Khodadad Farmanfarmaian. Zombanakis had just pulled off the biggest coup of his career with the signing of an $80 million loan for the cash-strapped shah of Iran. The Iranians had brought the beluga caviar and Zombanakis the vintage Champagne—the party went on into the night.

The Iranian loan was one of the first to charge a variable rate of interest that reflected changing market conditions and to be split among a group of banks. It was just as revolutionary in the staid world of 1960s banking as the moon landing, though celebrated with less fanfare, and it marked the birth of Libor.

"I felt a sense of achievement to set up the whole thing, but I didn't think we were breaking ground for a new period in the financial world," says Zombanakis, now living in Kalyves, on the island of Crete, amid the same olive groves his family has tended for generations. "We just needed a rate for the syndicated-loan market that everyone would be happy with. When you start these things, you never know how they are going to end up, how they are going to be used."

Much like the rate he created, Zombanakis had a humble start in life. The second of seven children, he grew up in a house with dirt floors and no electricity or running water, he told biographer David Lascelles. He left home at 17, fleeing Nazi-occupied Crete in a smuggler's open-topped boat to make the 200-mile journey to enroll at the University of Athens. Short of money, he quit in his second year and found work distributing aid for the recently arrived British army; he literally stopped a soldier in the street and asked for a job. After leaving Greece, Zombanakis eventually made his way to Harvard, where, with characteristic charm, he managed to talk himself into a postgraduate program despite lacking the qualifications. From Harvard he moved to Rome and entered the world of banking as the Middle East representative for Manufacturers Hanover Trust, aka "Manny Hanny."

The real action, though, was elsewhere. London was growing as a global financial hub. Russia, China, and many Arab states wanted to keep their dollars out of the U.S. for political reasons or out of fear they might be confiscated, and they chose to bank their money in the U.K. instead. The City of London was also benefiting from stringent U.S. regulations that capped how much American banks could pay for dollar

deposits and that cut the amount of interest they could charge on bonds sold to foreigners. Many companies set up offshore offices in swinging London, where they could ply their international trade unhindered. In 1968, after 10 years in Rome, Zombanakis saw an opportunity to further his career.

The Eurodollar market, as the vast pool of U.S. dollars held by banks outside the States is known, was already well developed, but Zombanakis had spotted a gap: the supply of large loans to borrowers looking for an alternate source of capital to the bond markets. He persuaded his bosses in New York to give him $5 million to set up a branch in London. Six-foot-three and impeccably turned out, Zombanakis made a striking impression, and before long he became known in tightknit British financial circles as simply "the Greek banker." He was one of a small band of international financiers who were opening up the world's markets to cross-border lending for the first time since the Wall Street crash of 1929.

Zombanakis first met Farmanfarmaian in Beirut in 1956, and the two had hit it off. So when the Iranians needed money, they headed straight to Manny Hanny's office on Upper Brook Street in London's exclusive Mayfair district. Zombanakis knew that no single firm would lend $80 million to a developing country that didn't have enough foreign-currency reserves to cover the debt. So he set about marketing the deal to a variety of foreign and domestic banks that could each take a slice of the risk. With U.K. interest rates at 8 percent and inflation on the rise, banks were wary of committing to lending at a fixed rate for long periods. (Borrowing costs could increase in the interim and leave them out of pocket.)

Zombanakis and his team came up with a solution: charging borrowers an interest rate recalculated every few months and funding the loan with a series of rolling deposits. The formula was simple. The banks in the syndicate would report their funding costs just before a loan-rollover date. The weighted average, rounded to the nearest eighth of a percentage point plus a spread for profit, became the price of the loan for the next period. Zombanakis called it the London interbank offered rate.

Other financiers cottoned on, and by 1982 the syndicated-loan market had ballooned to about $46 billion. Virtually all those loans used Libor to calculate the interest charged. Soon the rate was adopted by bankers outside the loan market who were looking for an elegant proxy for bank borrowing costs that was simple, fair, and appeared to be independent. In 1970 the financier Evan Galbraith, who'd go on to be U.S. ambassador to France under President Ronald Reagan, is said to have come up with the idea of pegging the first bond to Libor—known as a floating-rate note.

As London's financial markets took off, they became increasingly complex. Within a few years, Libor had morphed from being a tool to price individual loans and bonds to being a benchmark for derivatives deals worth hundreds of billions of dollars. Chief among these new derivatives was the interest rate swap, which allowed companies to mitigate the risk of fluctuating interest rates. The swap was invented during a period of extreme volatility in global rates in the 1970s and early 1980s. The concept is simple: Two parties agree to exchange interest payments on a set amount for a fixed period; in its most basic and common form, one pays a fixed rate in the belief that interest rates will rise, while the other pays a floating rate betting they will fall. The floating leg of the contract is pegged, more often than not, to Libor. It wasn't just company treasurers who bought them. Because swaps require little capital upfront, they give traders a much

cheaper way to speculate on interest rate moves than government bonds. Before long, banks had built up huge residual positions in the instruments.

As Libor became more central to the global financial system, pressure grew to codify the setting of the rate, which was still hashed out on an ad hoc basis by the various banks involved with individual deals. In October 1984, the British Bankers’ Association, a lobbying group set up in 1919 to champion the interests of U.K. financial firms, began consulting with the Bank of England and others on how such a benchmark might work.

Several early versions of the rate evolved into BBA Libor, set in pounds, dollars, and yen, in 1986. The BBA established a panel of banks that would be polled each day and tweaked the original formula to strip out the bottom and top quartile of quotes to discourage cheating. Otherwise the rate looked similar to the one first conceived by Zombanakis. Over the next quarter century, the suite of currencies was expanded to 10, and the process became electronic; other than that, not much else changed.

The same couldn’t be said of the U.K. banking industry, which was transformed by Prime Minister Margaret Thatcher’s “Big Bang” financial deregulation program of 1986. Overnight, she cleared the way for retail banks to set up integrated investment banks that could make markets, advise clients, sell them securities, and place their own side bets, all under one roof. She also removed obstacles to foreign banks taking over U.K. firms, leading to an influx of big U.S. and international lenders that brought with them a more aggressive, cutthroat ethos. The advent of light-touch regulation, with markets more or less left to police themselves, made London a highly attractive place to do business. The market for derivatives, bonds, and syndicated loans exploded.

By the 1990s, Libor was baked into the system as the benchmark for everything from mortgages and student loans to swaps. However, it was its adoption by the Chicago Mercantile Exchange as the reference rate for Eurodollar futures contracts that cemented its position at the heart of the financial markets.

Eurodollar futures are standardized, exchange-traded derivatives that let traders bet on the direction of short-term interest rates. For years, the value of the contracts was determined by a benchmark calculated by the CME, but in January 1997 the exchange ditched its own rate in favor of the now ubiquitous Libor. The Eurodollar futures market had been around since 1981, and the CME’s highly liquid contract was particularly popular among traders looking to hedge their exposure to over-the-counter swaps. As swaps, and much else besides, referenced Libor, the CME believed its product would be more appealing if it used the same rate. Average daily trading volume at the time of the switch was about 400,000 contracts. That had risen to 2.8 million by March 2014.

While the majority of market participants didn’t raise an eyebrow over the CME’s transition to Libor, at least two bank insiders did warn regulators that it was a dangerous move, Reuters later reported. One was Marcy Engel, a lawyer at Salomon Brothers, who wrote to the U.S. derivatives regulator, the Commodity Futures Trading Commission, in late 1996 warning that the shift would encourage cheating among traders. “A bank might be tempted to adjust its bids and offers near the survey time in such a way as to benefit its own positions,” she wrote. The other Cassandra was Richard Robb, a 36-year-old interest rate trader at DKB Financial Products in New York, who suggested in a letter to the CFTC that firms might be tempted to lowball their submissions during periods of stress to mask any funding difficulties. “Even back

then, it seemed to me that Libor was vulnerable to mischief," says Robb, now chief executive officer at Christofferson Robb and a professor at Columbia. "It was ripe to explode. It was constructed in a shabby way that was fine for its original purpose, but when it became so dominant, it should have been strengthened and put on firmer foundations."

The CFTC wasn't swayed by either appeal and signed off on the CME's decision. The prevailing view among regulators at the time was that Libor couldn't be manipulated. Since the top and bottom quartile of quotes were discarded, they believed it would be almost impossible to rig the rate without mass collusion. They also thought that banks would be discouraged from even attempting to game the system since the firms' individual submissions were published at midday for everyone to see. Anyone who started submitting dubious figures, the logic went, would instantly be identified by their peers and held to account.

In reality, manipulating Libor was a lot easier than anybody had thought. What authorities around the world failed to recognize was that even lenders that made submissions too high or too low to be included in the final calculation could still influence where Libor was set because they pushed a previously excluded rate back into the pack. Traders with vast derivatives positions needed only to move the rate by a few hundredths of a percentage point to make huge profits, and their influence was small enough to evade detection. On a $100 billion portfolio of interest rate swaps, a bank could gain millions of dollars from a 1-basis-point move.

Where Libor is set not only affects how much money banks and other sophisticated investors make on their derivatives bets, it also dictates how much interest U.S. homeowners pay on their mortgages each month. And poorer people with bad credit profiles are disproportionately affected. In Ohio, for example, 90 percent of all subprime mortgages in 2008 were indexed to Libor, double the proportion for prime loans.

From his sitting room in Kalyves, Zombanakis can see the house where he grew up. He says he sometimes struggles to recognize the modern world of investment banking, where traders take home multimillion-pound bonuses and cheat their clients at the drop of a hat. He counts Farmanfarmaian, who died last year, and many of his other clients as lifelong friends. "Back then the market was small and run by a few gentlemen," Zombanakis says. "We took it for granted that gentlemen wouldn't try to manipulate things like that. But as the market was getting bigger, you couldn't trust it. You couldn't control it. Banking now is like a prostitution racket run by pimps. There's just too much money involved."

For all its shortcomings, Libor is still a fixture of the global financial system. After the scandal, regulators talked about scrapping the benchmark and replacing it with one based on actual trades rather than what banks say their borrowing costs are. But that proved impossible, because the number was baked into so many contracts lasting many years. In 2014 the BBA was stripped of its role overseeing Libor and replaced by Intercontinental Exchange, a U.S. derivatives-trading platform. These days, Libor is based in part on actual transactions, but it still involves guesswork. Prompted by their success with Libor, authorities around the world undertook similar investigations into benchmarks for foreign exchange, precious metals, and commodities, unearthing widespread manipulation across markets and sparking billions of dollars more in fines.

Finch and Vaughan cover financial crime for Bloomberg News in London.

In Pursuit of a 10,000% Return

In a world starved for yield, betting on lawsuits has growing appeal. A case against Volkswagen over its emissions scandal has attracted noteworthy backers

By KIT CHELLEL

PHOTOGRAPH BY ART STREIBER

THE RESEARCHERS FROM West Virginia University who in 2013 first discovered evidence that Volkswagen might be cheating on emissions tests weren't thinking of California teachers at the time. But when the news of VW's deception finally broke on Friday, Sept. 18, 2015, Brian Bartow—chief lawyer for the California State Teachers' Retirement System, the second-largest pension fund in the U.S.—knew right away he had a problem. CalSTRS, with $190 billion or so in assets, owned about 330,000 Volkswagen shares.

Within days, VW's stock price plummeted almost 40 percent, CalSTRS had lost roughly €20 million ($22.5 million) on its holdings, and the carmaker's reputation was under withering attack. "It seems Volkswagen had a dirty little secret, and it's not just consumers who are feeling betrayed," Representative Fred Upton (R-Mich.), chairman of the U.S. Energy and Commerce Committee, said on Sept. 29.

Amid the fallout, Bartow e-mailed one of his legal advisers, Irwin Schwartz, who had been reviewing CalSTRS's exposure from his office in Westwood, Mass. Already, legal teams around the world were planning to sue VW for damages. Schwartz had plenty of experience in class actions and knew there was a way to join one without shouldering huge legal fees in a claim that might fail, risking the pensions of some 860,000 current and former teachers.

The trick was to find a case against VW that was being funded by someone else. He flagged one being readied for filing at Braunschweig District Court, about a half-hour drive from VW's headquarters in Wolfsburg, Germany. It was being handled by Quinn Emanuel, a big U.S. law firm that focuses on business litigation. Bentham Europe, a London-based investment firm that specializes in funding lawsuits, was looking for shareholders to join the case. In return for a share of any winnings, Bentham offered to cover all the costs of the action against VW.

For Bartow, getting on board was a simple decision. CalSTRS would pay nothing to take part, and if the German courts agreed that VW investors had been misled, the fund would get back at least some of what it had lost. So CalSTRS signed on as lead plaintiff, and the lawsuit was filed on June 20 of this year. "Volkswagen's actions are particularly heinous, since the company marketed itself as a forward-thinking steward of the environment," CalSTRS Chief Executive Officer Jack Ehnes said at the time.

By September, 80 more Volkswagen shareholders, most of them institutional investors like CalSTRS, had joined the Bentham claim. Some had never taken part in a class-action lawsuit before. Eventually, so many investors sued the carmaker that vans were needed to transport the paperwork to the Braunschweig court. For its part, VW set aside about €18 billion to cover the scandal's cost.

Bentham offered the same deal to all the plaintiffs it represented in the suit. Its cut would likely be in the region of 18 percent to 24 percent, depending on the size of the plaintiff's shareholding. For plaintiffs, the calculation was straightforward, says Bentham Chief Investment Officer Jeremy Marshall. "If they had to do it on their own," he says, "they frankly wouldn't do it." (He declined to comment on Bentham's take, saying its arrangements with shareholders are confidential.)

Although Bentham's website doesn't say so, the firm is owned by New York-based Elliott Management, a $28 billion activist hedge fund and one of a growing number to recognize how much money can be made betting on lawsuits. Elliott's founder and president, Paul Singer, is a pugnacious former lawyer with a history of using litigation to get what he wants. In a decade-long legal battle to make Argentina honor its debts following the world's biggest-ever sovereign default, Argentine officials called Elliott a "vulture" and "scum." Undeterred, Singer took the case all the way to the U.S. Supreme Court before Argentina settled earlier this year and agreed to pay Elliott and several other hedge funds $4.65 billion.

In its foray into litigation funding, Elliott originally teamed up with an Australian specialist firm called IMF Bentham to create Bentham Europe. Elliott, which bought out IMF's share of Bentham Europe in June, has never spoken publicly about litigation finance; two spokesmen declined to comment to *Bloomberg Markets* on the firm's funding plans.

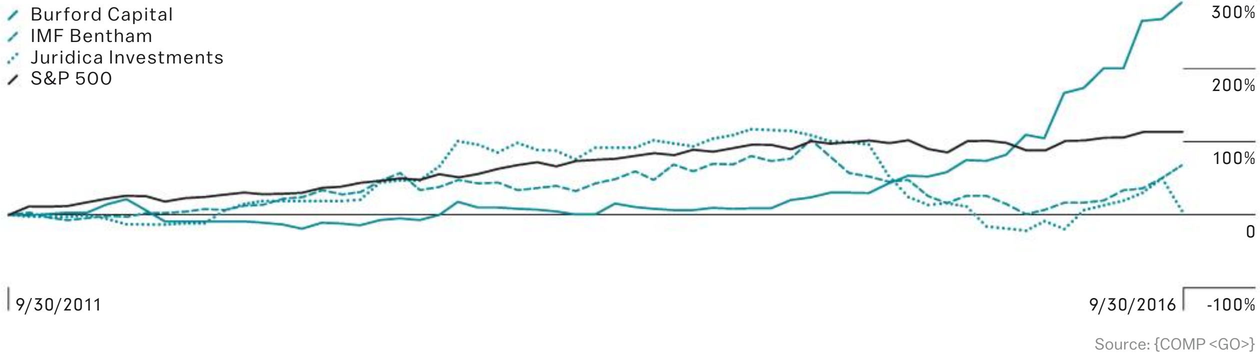
But it's easy to see the appeal of an asset class that isn't tethered to financial markets at a time when interest rates are at rock bottom and investment returns are anemic. If the VW shareholders lose, Singer's fund will have spent a few million euros to pay for German lawyers. If they win—and secure the €2 billion they're seeking in damages—Elliott could get back as much as €400 million, a potential return of 10,000 percent.

LITIGATION FUNDING has a checkered past. For centuries it was a crime to fund someone else's lawsuit, under ancient English "champerty and maintenance" laws created to stop noblemen from meddling in each other's quarrels. (To get a sense of the kind of behavior champerty laws were trying to prevent, imagine a medieval Peter Thiel, the PayPal tech billionaire who recently bankrolled Hulk Hogan's sex-tape lawsuit against Gawker Media because he disliked Gawker's journalism.)

By the 20th century, legal and accountancy firms started buying and selling insurance and bankruptcy claims informally, but champerty rules remained a barrier to trading in legal claims. Then, during the late

PUBLIC LITIGATION FUND PERFORMANCE

Total return



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1990s and early 2000s, a string of British and Australian court rulings held that it wasn't a bad thing for claimants with legitimate grievances to get external financial help, even if the helpers were out to make a profit.

Although litigation funding remained impossible in some jurisdictions, it spread quickly in others. Early investors in lawsuits were mostly opportunistic hedge funds and wealthy individuals whose involvement was private and confidential. It was a good deal for litigants, who no longer had to worry about spiraling legal costs; for lawyers, who got paid no matter the outcome; and for the funders, who could get back multiple times what they paid for a share of the suit if it succeeded.

Australian judges, keen to establish a level playing field between those doing the suing and those being sued, were among the quickest to lift restrictions and allow litigation funding to be done in the open. IMF Bentham, with offices across Australia, was the first litigation funder to sell its shares on a public stock exchange and a pioneer in the practice as a specialty rather than a sideline. After its float in 2000 raised A$6.6 million ($4.3 million), IMF remained a penny stock as markets struggled to value something that had never been traded before.

Since the financial crisis, however, lower interest rates have sent investors scurrying in search of decent returns, and litigation funding has become an increasingly attractive asset class. While the sums look small next to the $100 trillion global bond market, the profile of litigation funding's new supporters suggests an investment strategy on the rise.

Last year, Therium Capital Management, another London-based funder, secured £200 million ($303.5 million) in financing from a single company, believed to be the largest-ever single investment of this type. Therium didn't disclose the identity of its backer, but several people familiar with the matter say it's AmTrust Financial Services, a New York insurer with $21 billion in assets. (An AmTrust spokeswoman declined to comment.) Therium plans to raise more money, the people say. In June, Fortress Investment Group, a $70 billion alternative asset manager in New York, did a deal with London-based litigation funder Vannin Capital that gives Vannin access to a pool of as much as $500 million.

Litigation funding also provides a new line of work for attorneys. Harry Stockdale, a director at Haitong Securities in London who advises litigation funds on raising capital, estimates the amount of money committed to litigation finance has grown tenfold since 2009, to about $3.5 billion. If all those cases are successful, they could pay out as much as $30 billion. "This activity may be a fraction of the size of the fund management industry," he says. "But it isn't bad when you consider that most of the managers running litigation funds were practicing lawyers back in 2009."

Even so, this is frontier territory. Because litigation funding is too young to have much of a track record—and because funders share lawyers' fondness for secrecy—the asset class isn't easily analyzed. "One of the challenges of our business is the strict confidentiality that overlays our investments," Burford Capital, a publicly traded company and the world's largest litigation funder, said in its 2015 annual report. "We repeat our annual caution that individual litigation results are inherently unpredictable."

It can be hard for outsiders to get answers even to basic questions. What sort of returns can you expect, long-term, from investing in lawsuits? (Spoiler: probably less than 10,000 percent, but more than what the average hedge fund returns these days.) What are the dangers? How badly are investors hurt when funded cases fail?

To get some answers, *Bloomberg Markets* interviewed more than a dozen litigation funders, bankers, and academics, and analyzed data from the small number of firms that release figures publicly. What emerged is an asset class with unique characteristics. True to the maxim that lawyers make money in good times and bad, litigation funding is impervious to recessions and other economic shocks. Managed well, litigation funds can offer returns that are hard to find anywhere else.

IN MAY 2007, on the eve of the financial crisis, Colin Cameron became an executive manager for the City of Swan, outside Perth, Australia. More than 3,000 kilometers west of Sydney, Swan is a long way from the trading floors of Wall Street in distance and way of life. So Cameron was a little surprised to see Swan had invested taxpayers' money in something called a collateralized debt obligation with the Australian arm of Lehman Brothers. "I did a bit of research," he says. "You could read the stuff that was going on in America." Early in 2008 he began speaking to other councils who had AAA-rated CDOs that suddenly looked shaky.

When Lehman blew up later that year and the CDOs turned out to be worth mere cents on the dollar, a group of local governments in Australia arranged a conference call. About 50 people were on the line, including Cameron, officials from other cities, attorneys, and IMF Bentham Executive Director John Walker. Walker outlined the terms of a deal. He was willing to pay the legal fees for a group action against Lehman and its bankruptcy administrators as long as the local governments agreed to give up about 25 percent to 30 percent of their winnings. "We are risking our money on this, but we don't get anything unless we win," he told the group. "And we think we will win."

IMF's action eventually signed up about 70 local governments, charities, even churches. The case went to trial in 2011. Cameron testified that no one in his right mind would have invested in Lehman's CDOs if they'd known their defects. The judge agreed, and Lehman's liquidators settled the case in 2013. Cameron thinks Swan will get back most of its A$11 million exposure to the CDOs once the Lehman bankruptcy administration is concluded. Walker, who's since left IMF and started his own firm, says IMF made about A$55 million against the roughly A$13 million it spent funding the case over at least five years.

Litigation funding has its ups and downs. IMF has won, and lost, some big lawsuits. In the five years through Sept. 30, 2016, its shares returned 69 percent, including the dividends the firm pays out from its legal winnings. It's invested in a total of 187 cases and says it has a 90 percent win rate. This year its shares are up 41 percent as of Sept. 30.

Another publicly traded litigation funder, London-listed Juridica Investments, has also proved to be a roller-coaster ride for investors. Its shares dropped more than 40 percent during 2015 after a single negative ruling. The fund is now in "runoff," meaning its managers are seeing out its existing lawsuits but have stopped taking new cases. In the five years ended Sept. 30, Juridica delivered total returns of about 5.8 percent to its shareholders, including dividends.

During the same five-year period, IMF and Juridica underperformed the S&P 500 index, which returned 113.2 percent. And litigation funding can be costly when things go wrong. If a case fails, the funder waves goodbye to all the money spent on attorneys and, in some jurisdictions, such as the U.K., it's liable for the other side's legal bill, doubling the loss. Funders get insurance to cover themselves against this outcome. But it still hurts.

THE CARDSHARPS, a 16th century painting by Caravaggio, shows three men in feathered hats engrossed in a game of cards. One is cheating, reaching behind his back to where a spare deck is concealed next to a dagger. The combination of sumptuous Venetian style and the cocksure pose of the trickster, familiar even centuries later, has made the painting a classic worth millions of dollars.

In 2006, Sotheby's auctioned a similar work, thought to be a copy, for £42,000. The next year a collector announced that the painting sold at auction was a genuine Caravaggio, leading its previous owner, Lancelot Thwaytes, to sue Sotheby's for getting him such a paltry sum. Harbour Litigation Funding, a private firm run out of London, agreed to support him.

Thwaytes lost the case. Experts couldn't agree on whether the work was a copy or genuine, the judge noted in a 2015 decision. Harbour was left having to pay both sides' legal bills as well as the cost of hiring at least five art history experts to testify. Although the firm had insurance to cover some of the cost, it ended up losing about £2.8 million. Commenting on the case on its website at the time, Harbour said it carries out due diligence and only funds lawsuits it believes will, from the firm's vantage point, succeed. When a suit doesn't, Harbour said, "we have to write off our entire investment and move on."

The *Cardsharps* decision was never going to be a deadly blow to Harbour, which has about £400 million committed to cases around the world, worth as much as £2.5 billion. Litigation funders expect to lose; that's part of the deal. Modern specialist firms take on dozens of cases at a time, amassing a portfolio of assets. If they can get 5 or 10 times their money back with a good

result, they don't need to win many to make a profit.

Private litigation funds such as Harbour, Vannin, and Therium keep their returns a closely guarded secret. But several people with knowledge of the industry say annualized returns of 15 percent to 20 percent could be expected over the life of a fund. The asset class is becoming "more mainstream," according to Andrew Gardner, a lawyer-turned-banker at London-based Lancea Partners who helps private funds raise money. "You can have some tremendous wins," he says, adding that just one success can put an entire portfolio into profit.

Litigation funding's biggest lure may be its disconnection from markets. If the S&P 500 plunged 50 percent, litigation funds would still make money. If an asteroid made of gold crashed into the earth and the ensuing glut sent the traditional bear investor's refuge to historic lows, litigation funds would be unaffected. In both cases, they might even make more money, given that lawsuits tend to follow economic shocks. Gardner says that when litigation funds are raising money from investors, the line they use, in investment jargon, is "Private equity returns, but uncorrelated."

BURFORD CAPITAL, run out of New York and London, is the best-performing public litigation funder. In the five years to Sept. 30, it returned 291.6 percent to its shareholders, including dividends. Burford has branched out into legal insurance and loans to law firms; it's also diversified the type of cases it invests in. Traded on the London Stock Exchange, it now offers to fight defendant lawsuits on behalf of large corporations, one of which is reported to be BT Group, in return for a share of the money saved by a successful defense, rather than the winnings. (Burford declined to identify the company involved, saying such information is confidential.)

Burford hasn't seen the volatile swings of Juridica or IMF. But, as its 2015 annual report indicated, it doesn't generally tell investors which cases it's invested in, or when it wins or loses specific suits, or the terms of the deals it offers. Such secretiveness is standard practice across the industry, with the exception of IMF. Litigation funds as a group are happy to discuss access to justice—that is, the idea that they enable people to come to court who wouldn't otherwise be able to afford it. But they're reluctant to discuss actual litigation.

Even if they did, lawsuits are incredibly difficult to value. Payouts depend on the whims of judges, the crapshoot of evidence exchange, the reliability of witnesses, and a host of other intangibles. Funders get around this by hiring panels of senior judges and attorneys to review how likely a case is to succeed, but the process is more intuition than science.

Investors are mostly in the dark, says Malcolm Stewart, a former accountant who used to run a litigation fund and is working on a Ph.D. thesis about the industry at the University of Nottingham in the U.K. "You don't know what the assets are worth, and you don't know what the liabilities are," he says. "You don't know when it is going to end or when you are going to get paid." To an investor considering this asset class for the first time, Stewart has this advice: "If you are of a nervous disposition, don't."

And to unsettle your nerves a little more, there's this: What's happening to the legal market isn't that dissimilar to what happened to the mortgage market before the financial crisis. Something of inherent but uncertain value (in this case, a lawsuit) is packaged into a single entity along with so many other assets that it can absorb a given number of failures. That entity (in this case, the litigation fund) sells shares, or fund units, in the market, sending the risk out into areas of the market that can stomach it.

As with mortgages, the influx of money increases efficiency and allows more consumers access to the product by taking part in suits. Will the litigation funding boom, like subprime mortgages, also end in a bust? Its backers don't think so, nor, apparently, do those who are investing in it: The money is still coming in.

AS THE LEGAL OFFENSIVE against Volkswagen trundles on, the court in Braunschweig has logged about 1,400 suits on behalf of shareholders large and small. Altogether, claims for damages amount to at least €8 billion. While the legal battle could go on for years, Bentham CIO Marshall is optimistic about the chances of success, both for VW shareholders and his investors at Elliott. "We saw an opportunity, and we put it together and went out and provided it to the market," he says.

For Bartow, the CalSTRS lawyer, taking VW to court isn't all about the money, he says. Bartow, who in his free time makes paintings of the California coastline, declined to be interviewed at length for this article. But he said in e-mails sent through a spokesman that companies must be held accountable for engaging "in such widespread deliberate deceit which destroys shareholder value, damages their reputation, and harms the public."

Volkswagen Group spokesman Hermann Prax says the company "remains of the opinion that it duly fulfilled its disclosure obligations under capital markets law." As it prepares to defend itself in court, VW, founded eight decades ago to build the "people's car," is finding out how expensive it could be to violate the people's trust. ● —*With Karin Matussek*

Chellel covers legal affairs in London.

Cheat Sheet

A Compendium of New and Featured Functions

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NEW ENHANCEMENTS TO TRY RIGHT NOW

WHIS Allows you to browse through crowdsourced estimates for more than 50 coming economic data releases and events. You can enter your own forecasts and compete—either publicly or anonymously—to be listed as one of the most accurate forecasters in the Bloomberg League of Champions. 104

GMM Identifies and monitors the best- and worst-performing assets globally and across asset classes in real time. This function makes it easy to spot outliers and trends. To track the impact of Donald Trump's election as U.S. president, click on the arrow to the right of Chg on Day and select Trump Elected. 38

BGNE Displays foreign exchange rates from the Bloomberg generic price executable (BGNE) FX pricing source, which is derived from purely executable data. The monitor section in the upper left of the screen lets you discover which currency pairs are available. The Live Stream panel displays quotes for a selected currency pair. To gain an understanding of liquidity available for different sizes, you can monitor the current best bid/ask in the Volume Tiers section.

LIQD Monitors the frequency and improvements in quality of price quotes you get in your MSG in-box, so you can spot developing pools of liquidity in cash credit markets.

GPO ELECT Charts pricing for a selected security with an event icon that flags the U.S. presidential result, so you can evaluate post-election price trends.

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The Wisdom of Crowds

By JOE WEISENTHAL

A Function I Love

WHIS <GO>

TO DO WELL in markets, you have to understand the fundamentals of what you're trading. But as John Maynard Keynes wrote in his *General Theory of Employment, Interest, and Money*, "professional investment" is like a beauty contest—except instead of trying to pick the most beautiful face, you try to pick the one that most other people in the contest are going to pick. You have to understand both the underlying attraction and how the crowd views said attraction.

There's probably no better way to get a real feel for how people see the economy than using the function **{WHIS <GO>}**. The Bloomberg League of Champions lets anyone enter a guess—estimate, sorry!—on coming economic data points across a range of countries. Have a view on Indian industrial production? Put your number in. Have a feel for South African retail sales? Enter your projection. The U.S. jobs report? Lots of people take a stab at that.

In addition to putting your figures forward, you can see the "whisper number" (hence the function's mnemonic) and how it differs from the official survey of economists. There's a scoreboard that shows which Bloomberg users are the best at forecasting data (you're anonymous by default). You can also see when those users entered their numbers to glean insight into the best time to make a prediction.

There's plenty more you can do. You can see which users are the best over time at predicting any given number, and you can compare the community's guess vs. the official Wall Street prediction, for example. Sometimes crowds are incredibly wise. Sometimes they're incredibly foolish and get blindsided. With **{WHIS <GO>}**, you can see where the crowd is, stake out your position, and trade accordingly. You might even win a trophy. Good luck!

Weisenthal co-hosts *What'd You Miss?* on Bloomberg TV and is the executive editor of digital news at Bloomberg.

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5	Citigroup	C	5.84%
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