The 300 secrets* to high stock returns

*Caveat: Most of them probably won’t work

Plus: How to be happy without earning more

Has the world gone crypto crazy?
“In the underregulated Wild West of crypto, self-proclaimed pump-and-dump groups brazenly advertise their membership opportunities.”
A t one time, the search for factors was a way for academic researchers to explain why some stocks perform better than others. These days, factors are more like a supermarket shelf of options for retail investors to choose from.

Vanguard, the investment giant, explains on its website that “factor based” funds offer the opportunity to “tilt” a portfolio toward certain stock characteristics—whether you believe that the key to returns is a stock’s momentum, liquidity, or balance-sheet quality, there’s a fund for that. But these funds “come with significantly more risk than you’d experience investing in the broader stock market,” the company warns.

That hasn’t stopped Vanguard and its rivals, such as BlackRock, from creating and selling such funds. Meanwhile, academic researchers search for more factors, which in turn fuels the factor-investing industry. The result is that researchers have identified more than 300 factors, at last count, each of which claims to have isolated its own characteristic of high stock returns.

But do they all work? Some researchers, among them Chicago Booth’s Dacheng Xiu, are highly skeptical, as our cover story explains (page 24). Booth’s Eugene F. Fama has, with Dartmouth’s Kenneth R. French, identified five factors that could potentially be harnessed to enhance investment returns. Xiu and his coauthors find 13 factors that hold some explanatory power. But the idea that less is more may be a hard sell: “factor inflation” could be tough to contain, given investors’ permanent desire to find alpha.

Here’s another radical notion to share with investors: Instead of maximizing wealth, how about maximizing happiness? This is a suggestion from Booth’s Christopher K. Hsee, a behavioral scientist who has spent much of the past decade researching how people can extract the most happiness from their existing resources.

While lifestyle gurus preach about the paths to happiness, Hsee and his colleagues have run dozens of experiments and collected data to better understand what truly makes people happy, and what doesn’t. Their research underscores why it makes sense to satisfy inherent preferences, avoid overearning, and know better than to take out a big mortgage to buy a palatial home (page 32). This, of course, may be another hard idea to sell to motivated investors—but Hsee argues this way of thinking is actually a perfect complement to traditional economics. In his view, economics has likely helped you amass a good amount of wealth—and now his course of study, hedonomics, will help you optimize the way you spend it.

What unites traditional finance and behavioral science is the aim of trying to understand what drives decision-making. If one person embodies the bridge between the two, it is Booth’s Richard H. Thaler, who, in an excerpt from his Nobel speech given in Stockholm, explains how a bowl of cashews led him on a path to behavioral economics (page 47). Another Booth behavioralist, Oleg Urminsky, unpacks research that finds you can offer people a short-term “carrot”—pay kids to read books, for example—without worrying about ruining their long-term motivation (page 56).

Our website has many more articles, videos, and infographics that could help you maximize returns, optimize happiness, or just keep up to date on the latest research. Please give us your feedback: while your emails and social-media comments may not boost our retirement accounts, they definitely make us happy.

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FOOTNOTES

47 Behavioral economics from nuts to ‘nudges’
   By Richard H. Thaler

50 Globalization is close to its ‘holy cow’ moment
   By Richard Baldwin

56 Short-term rewards don’t sap long-term motivation
   By Oleg Urminsky

62 Fiscal policy has put the US on an earthquake fault of debt
   By John H. Cochrane

64 Don’t get run over by your customers
   By John Paul Rollert

68 Has the world gone crypto crazy?
   By Waverly Deutsch

74 Want more policies based on evidence?
   By Christian Leuz

78 Free markets for free men
   By Milton Friedman

82 Should college athletes be paid?
   The IGM Panel

84 Are financial markets too fast?
   The Big Question

Christopher K. Hsee, Theodore O. Yntema Professor of Behavioral Science and Marketing, has spent more than two decades studying the relationship between decision-making and hedonic experience. President-elect of the Society for Judgment and Decision Making, Hsee has received the Distinguished Scientific Contribution award from the Society for Consumer Psychology. For him, doing research to resolve curiosity is the best way to boost happiness. (Pages 20 and 32)

Christian Leuz, Joseph Sondheimer Professor of International Economics, Finance, and Accounting, researches the roles of disclosure and transparency as well as regulation in financial and other markets, international accounting, and corporate governance. He is a codirector of Booth’s Initiative on Global Markets and a fellow at several prestigious research institutes. (Pages 14 and 74)
Go to Review.ChicagoBooth.edu to find the articles to which these comments refer.

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READY FOR TARGETED PRICING? NOT SO MUCH

In response to ‘Are you ready for personalized pricing?’ (Spring 2018)

The problem is that in an onlineshopping world, few will ever know how much more they have paid for a product, or service. One could argue that the online marketplace is an anticompetitive one because it is not transparent, i.e., the demand side does not have perfect information.

—Usha Meghani Abramovitz

People will just start apps that automatically report what they’re paying for something when they buy it on Amazon, and it’ll be cross-referenced against other folks from that part of the country.

—Gregory Scott Wilson

If this takes off on a large scale, I would expect a consumer backlash, as this is a classic example of information asymmetry. Essentially, if you are not exactly at the intersection of the demand-supply curve, any purchase should have some consumer price surplus. What businesses are doing is trying to recapture that in their favor as a production price surplus. Unless the demand is highly inelastic, or possibly a Veblen good, it would make sense for customers to shift purchases of identical items to suppliers who do not price discriminate. It’s a short-term positive for the supplier at the cost of a long-term negative—as soon as the practice becomes known, the business will lose those customers.

—Telid

HEALTHY CAN BE AFFORDABLE

In response to ‘Higher income, healthier groceries’ (Spring 2018)

Sugary carbs are cheap and filling, and a household trying to stretch its dollar is more concerned with feeding the family overall. The stigma of “healthy” being expensive is really strong. We need to get into these communities and show lower-income households it’s possible.

—Lauren Owens

BIG-TECH TALK

In response to ‘Are Google and Facebook monopolies?’ (Spring 2018)

Why ask? Of course they are.

#OutofControlMakingCapitalismLookBad

—Norman Bagley

The transcript doesn’t read like a real conversation—more like the disputants alternated reading paragraphs of position papers.

—Tom Barson

PRAISE FOR THE CAPITALISN’T PODCAST

Very much enjoying @katewaldock and @zingales podcast from @chicagoboothrev. Topic to topic, they have been great! Found it by accident, but now subscribed. Thanks!

—Pranav Kothari
A WEALTH OF RESPONSES TO OUR POVERTY STORY

In response to ‘How poverty changes your mind-set’ (Spring 2018)

Decisions require options. Poverty vastly limits options.
—Ronald Archambeau

Exactly!! That’s such a fundamental concept that goes over the head of the average US American. Talking about inequality need not be so difficult.
—ÉFKO’Conghaile

Social deprivation is associated with differences in physiologic responses to stress. The cold pressor test is an example: [subjects experience a] greater hypertensive response as a result of plunging their hand into a bucket of ice. Why shouldn’t it also be associated with neurophysiologic differences? Ever tried to concentrate when hungry or scared?
—Klemens Meyer

It is obvious that one’s mental condition changes with one’s circumstances. It is the case for everyone everywhere. That is no excuse for poor decisions. #ManUp #OwnYourChoices #PersonalResponsibility
—Samuel Zavaletta

Really interesting set of experiments. I can’t help but wonder if extreme wealth also fosters “bad choices”?
—Patrick Webb

It’s crucial to understand the psychological elements of poverty. It is almost like price stickiness except 1,000 times more insidious. When you understand the impact poverty has on cognition and socialization, it becomes easier to recognize where many of our policies are, in fact, creating poverty traps. Traditional economics really had no appreciation for these things, but thankfully people are starting to gain a better understanding of this.
—generalmandrake

That’s the irony of poverty. The brain is in a stressed state of constant crisis-resolution mode, which impairs long-term planning and strategic thinking. It is excellent for short-term problem-solving but horrible for long-term planning (which is actually needed for getting out of poverty for good). The poor brain is working overtime and efficiently, but not effectively.
—Naijaboiler

I would imagine that having to constantly manage your resources and stress about things takes a lot away from contemplation and physical health. Which probably affects mental health. An element of resource management is pretty important, but poverty, I believe, is not good for mental development in a majority of cases. Especially if [children in poverty] are exposed to violence, neurotoxic substances, irresponsible drug use, bad parenting, and domestic violence—or have an upbringing that’s filled with anxiety and trauma.
—I would imagine that having to constantly manage your resources and stress about things takes a lot away from contemplation and physical health. Which probably affects mental health. An element of resource management is pretty important, but poverty, I believe, is not good for mental development in a majority of cases. Especially if [children in poverty] are exposed to violence, neurotoxic substances, irresponsible drug use, bad parenting, and domestic violence—or have an upbringing that’s filled with anxiety and trauma.
—Augustus2020

Which came first, the chicken or the egg? It’s a vicious reinforcing cycle where poor people (rightly so) focus on survival while the wealthy have the luxury to invest and scale.
—Vincent Chung

It’s not as if everyone starts on the same level. A genius in poverty has to make up a lot of ground before reaching the starting point of the average wealthy youngster; so many pitfalls along the way that few make it to the point the more affluent started from.
—Michael Tomlin-Brenner

An overdeveloped amygdala is NOT necessarily a good thing! Fight or flight does not make for good mental wanderings into deep, or unfamiliar, concepts. Ever teach middle-school students who are impoverished? It takes months to get kids’ guards down enough to play with learning and to be brave enough to make mistakes . . . as opposed to being a clown, or simply acting out to avoid work. And, a single incident with a sub, or a hint that their trusted adult figures think they’re “ghetto” or “dumb” can cause serious backslides! And it’s because of that amygdala. . . . Those street smarts are great for a lot of things, but not difficult academic pursuits . . . survival, food, shelter, but not algebra or poetry.
—Chillinoutloud

Similar research reported back in 2012 with farmers before and after crop sales . . . Poverty diminishes the “mental bandwidth” needed for optimal decision-making. It’s not a coincidence that high levels of poverty and precarity lead to negative coping strategies.
—Dan Horn
Make your start-up soar

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Noncompete agreements, which prevent employees from going to work for competitors or starting competing businesses, have become pretty common: 38 percent of workers have at some point signed a noncompete agreement with an employer, according to University of Maryland’s Evan P. Starr and University of Michigan’s J. J. Prescott and Norman Bishara. Even some workers at the sandwich maker Jimmy John’s signed noncompetes until the New York attorney general stepped in.

But while noncompetes raise investment significantly, they also measurably hamper entrepreneurial activity, according to Chicago Booth’s Jessica S. Jeffers. Jeffers surmised that noncompetes could shed light on the declining start-up rate of new businesses in the United States, including those in high-tech sectors. To investigate, she obtained de-identified data from LinkedIn on its users’ employment histories, which she mined to see when employees switched companies. Jeffers
matched these data with state-level changes in the legal enforceability of noncompetes, specifically eight changes implemented between 2008 and 2014, six of which made it easier for companies to enforce these agreements.

When noncompetes became easier to enforce, 12 percent fewer workers left their companies to take other jobs within the same industry, she finds.

Increased noncompete enforceability also led to fewer employees leaving for more-senior positions—a decline of 39 basis points, or 15 percent relative to the average departure rate. Perhaps most importantly, the number of employees leaving for start-ups dropped as well, and in turn the number of companies entering knowledge-intensive sectors such as technology and professional services declined by an estimated 18 percent.

By contrast, noncompetes significantly boosted investment at large existing companies. Jeffers finds that stronger court enforcement consistently led publicly held companies to make bigger capital investments. The companies in Jeffers’s sample increased investment by $6,000 for every $100,000 of net capital—while companies with a high proportion of skilled employees (those most often targeted by noncompetes) increased investment by $10,000 for every $100,000 of net capital.

“These results point to an important trade-off between encouraging the entrance of new firms on the one hand and investment at existing firms on the other hand,” she notes.—Alex Verkhivker

Go to Review.ChicagoBooth.edu to see citations for research mentioned in this article.

Less worker mobility, more company investment

In places where noncompete agreements were easier for companies to enforce, entrepreneurial activity slowed down, and companies made bigger capital investments.

Jeffers, 2018
How stricter financial-reporting enforcement can hurt shareholders

Financial crises in Europe and the United States have revived interest in what publicly traded companies are required to disclose. Supporters of strict public enforcement of disclosure rules argue that it increases the likelihood that companies will behave well, thereby boosting investor confidence in financial markets.

But Chicago Booth’s Hans B. Christensen and Mark G. Maffett and Booth PhD candidate Lisa Yao Liu examined how increased financial-reporting enforcement affects shareholders, and find the costs can outweigh the benefits.

The research takes advantage of a 1991 UK initiative that set up the Financial Reporting Review Panel to oversee companies’ financial reporting. Much the way the US Securities and Exchange Commission does, the FRRP began proactively reviewing financial reports in 2004, rather than doing so only in response to a complaint. From 2004 to 2011, it announced in advance which industries it planned to focus on in an upcoming year, giving companies a chance to preemptively improve their financial-reporting compliance. Sectors such as telecommunication, advertising, and insurance were selected only once during the seven years the FRRP announced its enforcement goals. Others were inspected more frequently; the retail sector was the most frequently targeted.

Christensen, Liu, and Maffett looked at how companies responded, analyzing the reactions of the companies included in the FRRP’s targeted sectors. On average, a company’s annual report issued between 2004 and 2011 contained a financial-statement section that had 15,500 words. When the FRRP announced a targeted sector, the number of words in the financial-statement section grew 4 percent—and ended up 610 words longer than at companies in industries that weren’t targeted. The researchers also find that stock market liquidity increased by approximately 5 percent.

However, companies scrutinized by the FRRP also increased their spending on reporting systems. Using Thomson Reuters Worldscope database, the researchers parsed the data for audit fees paid by companies under the FRRP’s watch. The average company in the sample had $826 million in total assets and paid audit fees of $784,000 per year. Compared with companies not inspected, the targeted companies spent $32,000 more in audit fees—an increase of more than 4 percent. Importantly, the researchers note, audit fees are not the only costs likely to increase thanks to the increase in enforcement—these other costs, such as management’s time and changes in corporate investment policies, are inherently difficult to measure.

Although the data suggest that focus-sector firms appear to have improved their disclosure, it’s not clear that the benefits associated with the additional oversight outweigh its costs. When the FRRP announced which industries it would target, stocks in those sectors reacted negatively, declining by as much as 1.5 percent.

“Despite the improvement in transparency, increasing proactive financial reporting enforcement intensity could have a net-negative effect on shareholder wealth,” write the researchers. Their findings suggest that enforcement had significant costs for both the companies being reviewed and the shareholders, who ostensibly stood to benefit from greater regulatory scrutiny.

—Alex Verkhivker

High expectations can bolster confidence, resulting in increased effort, more persistence, and better performance. But when people fall short of expectations early on, many become concerned with what others think and potentially give up or change course, research suggests.

“After exhibiting initial poor performance on a task, individuals who face high external expectations feel more embarrassed about violating public expectations and in turn are less persistent than individuals who face low external expectations,” write University of California at Los Angeles’s Hengchen Dai, Chicago Booth’s Berkeley J. Dietvorst, American Express GBT’s Bradford Tuckfield, and University of Pennsylvania’s Katherine L. Milkman and Maurice E. Schweitzer.

The most direct way to maintain a positive reputation after an initial setback would be to persist in order to improve, but doing so risks further embarrassment and perhaps failure. For this reason, the researchers hypothesize, some people instead seek an exit strategy—whether that’s stepping down from an executive position or making a subtler move, such as switching tasks.

Take professional tennis players, for example. The researchers analyzed data, including scores and player rankings, from more than 328,000 men’s tennis matches. Favorites, or players entering a match with a higher ranking, won almost 62 percent of the time, and 18 percent of these players lost the first set but rallied to win the match.

The researchers used a regression discontinuity design (which compares observations just above and below a threshold) to study matches between closely ranked players, making status as favorite or underdog somewhat arbitrary but still potentially important psychologically. They find...
that being labeled a favorite instead of an underdog is associated with an estimated 27 percent increase in a player’s likelihood of quitting, in some cases due to injury, after losing the first set of a match.

“We have suggestive evidence that some of the injuries that favorites claim are, at the very least, less severe than those claimed by underdogs if not entirely fictitious,” the researchers conclude. “This is consistent with our proposed mechanism that people use quitting as an impression management strategy.”

In a laboratory experiment, the researchers engaged 304 participants in a trivia challenge and told them they would be randomly assigned questions of either “middle-school difficulty” or “expert difficulty.” In reality, the questions were the same, but participants who were assigned to the middle-school-difficulty treatment had higher performance expectations. Participants were given the option to switch to questions on new topics at any time after the first 20 questions. They knew they would be told their score regularly, that scores would be posted on the blackboard before the session ended, and that if they switched topics, their scores would be based only on the questions they answered after switching, meaning they could effectively reset their scores. They also learned that switching topics had a cost—they would earn less money for each question that they answered correctly.

In the first 20 questions, participants in both conditions answered correctly approximately 23 percent of the time. Yet the middle-school-difficulty participants switched topics sooner, after reporting significantly greater feelings of embarrassment.

“We both theorize and demonstrate that facing high external expectations can, in the face of early setbacks, be a burden,” the researchers write. In the business setting, they say, this means that “managers should focus attention on employees who face high expectations and experience early setbacks and develop strategies to help them,” such as building a culture that accepts and learns from failure.

—Ed Finkel


HOW TO HELP CONSUMERS MAKE BETTER DECISIONS

SMART FINANCIAL decisions may seem straightforward: pay with cash, save money, shop around for the best deal. But, as the United States’ $14.5 trillion in household debt attests, such decisions can be tough for consumers. Economists and policy makers can help, according to a study by the Behavioral Science & Policy Association’s working group on financial decision-making.

One of the main problems, the research argues, is that consumers often don’t shop around enough when choosing financial products. “People either aren’t factoring in all the relevant information or aren’t aggregating it correctly,” says Chicago Booth’s Abigail Sussman, one of the researchers in the BSPA working group. Because buying a home and financing college are decisions made rarely, perhaps even only once in a lifetime, people don’t learn from experience the way they do from smaller, more frequent decisions.

The social context in which a person makes a decision also plays a role. People may fear being judged poorly for exploring certain cost-saving options, such as federal aid. They may be influenced by peers’ decisions, or by a default option that’s presented. Finally, they may put too much trust in advisors or companies that don’t have the customer’s best interests at heart—or they may be afraid to trust advisors at all.

But companies, policy makers, and others with influence can assist customers in making better choices, the researchers write. Employers could make enrollment in a retirement plan the default for new employees, for example (see “When ‘nudging’ is forever—the case of Sweden,” on page 18). Credit-card companies could notify customers before a charge is added to their account or provide tools to make clearer how compound interest works. Governments could encourage people to have specific savings plans in place to invest their tax refunds.

The researchers also suggest some fixes aimed directly at US borrowers, including that the US Department of Education could help people figure out the amount in college loans they should borrow, the salary they can expect after graduation, and the likelihood of defaulting on their loans. And the US Consumer Financial Protection Bureau could create a tool for potential home buyers that would show the best type of mortgage based in part on their projected risk of defaulting.

Sussman says companies that profit from consumer, school loan, and housing debt do want to help people reduce their debt levels. “It’s not actually helpful to the company to have customers defaulting all the time,” she notes. “They’re often interested in helping. And from a branding perspective, this is particularly true—they want to be thought of as looking out for their customer.”—Alice G. Walton


One of the main problems is that consumers often don’t shop around enough.
INSIDER INFO CAN MISLEAD START-UP INVESTORS

IN THE WORLD of start-ups and venture financing, a lot of success is credited to relationships developed with entrepreneurs based on early-stage financing deals. By becoming an insider years before a new company seeks capital from public markets, an investor gains an information advantage that serves him or her well, the thinking goes. Banks develop similar relationships with borrowers. But this kind of “insider” information may actually be designed to gin up more funding for the entrepreneur, rather than help an investor make the best decision about whether to continue the relationship into future rounds, according to Chicago Booth’s Lin William Cong and Booth PhD candidate Ehsan Azarmsa. Their research suggests that what you know is at least as important as who you know.

The information given to an initial financier is perfectly legal and distinct from the “insider information” typically mentioned in discussions about securities trading. A start-up may share news about internal experiments, or details about the background and dynamics of the company’s founding team—the kind of data that can flow easily to someone working closely with or monitoring an entrepreneur.

By modeling this sort of information, the researchers identify a new source of inefficiency in relationship financing. And based on their findings, Azarmsa and Cong propose a way of structuring start-up or early-stage capital injections so that the incentives of entrepreneurs better align with those of investors and lenders.

The researchers cite the drone company Skycatch, which chose to pursue a big contract with a well-established company rather than smaller trial projects. Even though Skycatch could have used the same resources to complete several smaller projects with a greater rate of success, landing one big partnership—though making the task challenging—would likely wow its financiers and persuade them to continue the relationship past the initial financing round, the researchers learned.

The Skycatch case suggests that management teams make decisions intended to persuade or convince investors to make future investments, according to the researchers, in which case information gleaned from what seems like a privileged view of the company might not be all that valuable. This can be partly counterbalanced by an investor’s sophistication and, perhaps counterintuitively, by a moderate level of investor competition. A company may be reluctant to tell too much to an initial investor for fear of giving that investor more bargaining power down the line. But if an initial investor commits to including other financiers in the next round, that could allay the entrepreneur’s concern.

Even better, the researchers argue, might be for companies to structure fund-raising in a way that would eliminate the information design problem. In the initial round of financing, investors could get warrants to later purchase convertible securities, while in later rounds, outsiders—new, arms-length investors—could purchase securities such as equities. In this way, entrepreneurs would still control the flow of information, but cash flow would ultimately provide an objective scorecard. Investors would execute warrants only when a company’s valuation made doing so economical. Meanwhile entrepreneurs, knowing that new investors could end up purchasing the securities at competitive prices, would have a reason to produce information efficiently.—Michael Maiello


Why the ‘Dollars a Day’ Pitch Works

CHARITIES THAT ENCOURAGE PEOPLE to donate “just dollars a day” may have the right idea—and more businesses should consider following suit. University of Rhode Island’s Stephen A. Atlas and Chicago Booth’s Daniel Bartels find that framing a cost as a series of small daily expenses makes an offer more tempting—plus people think they’re getting more for their money, whether the outlay is for charity or a purchase.

The researchers established this preference for periodic pricing in a series of experiments that asked participants about charitable donations, car leases, and meal-delivery services.

Donate to a charity
In one experiment, participants read about either donating $1 a day or making an annual donation of $350 to a charity helping underprivileged people. They were more likely to want to donate when the amount was framed as a per-day cost, and they were more likely to say they’d derive greater pleasure from the donation.

Participants’ ratings of the level of daily pleasure they would get from donating

<table>
<thead>
<tr>
<th>Scale: Very little</th>
<th>0</th>
<th>Very much</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1 a day</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$350 a year</td>
<td>3.8</td>
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<tr>
<td>$350 a year</td>
<td>3.8</td>
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Start a subscription
Results of another experiment suggest that the effect held for MBA students, who said they were more likely to sign up for newspaper and streaming-music subscriptions when the cost was framed as a small daily amount. And the student participants who chose the periodic-pricing option were happier with their purchases than people who chose to pay a lump sum, even though the lump sum was a better deal in some cases.

Participants who said they would sign up for a subsidized annual subscription

<table>
<thead>
<tr>
<th>Service</th>
<th>Daily Price</th>
<th>Annual Price</th>
<th>Respondents who said they would sign up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Street Journal</td>
<td>$20 a day</td>
<td>$7,250 a year</td>
<td>6.9%</td>
</tr>
<tr>
<td>Hulu</td>
<td>$20 a day</td>
<td>$7,250 a year</td>
<td>5%</td>
</tr>
<tr>
<td>Economist magazine</td>
<td>$20 a day</td>
<td>$7,250 a year</td>
<td>6.4%</td>
</tr>
<tr>
<td>Spotify</td>
<td>$16 a day</td>
<td>$99 a month</td>
<td>1.3%</td>
</tr>
<tr>
<td>New York Times</td>
<td>$27 a day</td>
<td>$98 a month</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Lease a fancy car
In an experiment involving major transactions, researchers asked participants how likely they would be to lease a luxury car. To some, the researchers pitched the cost as $20 a day (which comes to $7,300 over the course of a year). For others, they framed the lease as an annual payment of $7,250. Again, participants offered the daily price were more likely to say they’d lease the car and derive greater pleasure from it.

Participants’ ratings of the likelihood they would lease the car...

<table>
<thead>
<tr>
<th>Price</th>
<th>Rating</th>
</tr>
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<tbody>
<tr>
<td>$20 a day</td>
<td>6.9</td>
</tr>
<tr>
<td>$7,250 a year</td>
<td>5</td>
</tr>
</tbody>
</table>

...and their ratings of how much fun it would be to lease the car

<table>
<thead>
<tr>
<th>Price</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>$20 a day</td>
<td>7.8</td>
</tr>
<tr>
<td>$7,250 a year</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Sign up for a meal-delivery service
Finally, the researchers teamed up with a meal-delivery service that agreed to run ads offering services at $16 a day or $99 a month. First-time subscribers bought 77 percent more meals when the service was pitched as a daily expense.

First-time visitors to meal-delivery website who made a purchase

<table>
<thead>
<tr>
<th>Price</th>
<th>Respondents who made a purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>$16 a day</td>
<td>1.3%</td>
</tr>
<tr>
<td>$99 a month</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

“Our framework and results suggest that periodic pricing can help people appreciate the benefits they accrue from a purchase,” the researchers write. “So, under the right conditions, marketers can encourage purchase with periodic pricing, even for significant sums of money.”—Alice G. Walton

DELAYING IPOs HAS LASTING EFFECTS

DELAYING INITIAL public offerings when companies are ready to go public can significantly disrupt innovation, and the effects can last for years, according to Chicago Booth’s Lin William Cong and New York University’s Sabrina T. Howell.

The China Securities Regulatory Commission, which occasionally suspends IPOs marketwide out of concern that an influx could reduce liquidity and hurt the market, took this action nine times from 1994 through 2015. Cong and Howell were able to obtain data to analyze four of the cases.

The researchers examined the effects the suspensions had on the companies’ performance and value creation, including on the number of patent applications the companies put up, capital expenditures, and personnel movements.

They find that suspensions reduced patent activities in terms of both quantity and quality for years after the companies were finally listed. Each month of delay in an IPO reduced a company’s patent applications after listing by 13 percent, patent citations by 10 percent, and global granted patents by 25 percent. Delays also led to lower investment in plant and equipment, increased leverage, less cash as a share of assets, lower price-to-book ratios, and lower returns on sales. Most effects disappeared shortly after listing.

But the effects on innovation began shortly after IPO approval and endured for years after a company was ultimately listed, indicating that the delay, in addition to temporarily affecting a company’s access to capital, disrupted corporate innovation, which is a cumulative process. The researchers substantiate this point by showing that listing delays caused higher company uncertainty and personnel turnover.—Alex Verkhivker


Stricter banking supervision boosted lending

AFTER banking crises, there’s an inevitable call for stricter rules and oversight, as the public blames regulators for not having cracked down on weak banks. This was true after Washington Mutual, IndyMac, and Countrywide Financial failed in 2008, and the ensuing financial meltdown led to a regulatory overhaul that included the Dodd-Frank Act.

But regulation involves trade-offs, and does stricter banking supervision end up hurting the economy? Chicago Booth’s João Granja and Christian Leuz consider the effects of one recent banking reform and conclude that it actually had positive effects, including at banks that were already pretty strong.

The researchers zero in on the US’s Office of Thrift Supervision, which prior
to the 2007-10 financial crisis oversaw many savings banks and savings-and-loan institutions. Created in the wake of the savings-and-loans crisis of the 1980s, the OTS was blamed for lax oversight and dissolved in 2011, as prescribed by the Dodd-Frank Act. Roughly 10 percent of the country’s depository institutions were sent to other regulators, which allowed the researchers to analyze how the ensuing stricter oversight affected banks and their lending.

The change forced many banks to look more closely at their lending policies and risk management. And despite the fragile recovery, this proved good for entrepreneurs: former OTS banks increased their new small-business lending by 10 percent. Affected banks increased small-business lending more than nearby banks whose oversight hadn’t changed, and that led to more new businesses. The pattern was less rosy for existing establishments, however, and more of those closed up shop in areas where former OTS banks had a greater presence.

The evidence finds that poorly capitalized former OTS banks reduced lending, on average, suggesting that the new regulatory standards forced these institutions to halt lending. But the lending effects varied with the strength of the bank. With stricter supervision, stronger banks lent more to small businesses, while weaker ones didn’t.

The positive effects were stronger for banks that were more likely to have received greater attention from the new regulators, which the researchers measured in part by looking at each bank’s physical proximity to the new regulator. Former OTS banks that found themselves closer to their supervisor’s field office saw more lending—as did former OTS banks with bigger changes in loan provisioning, as those changes were likely induced by their new overseers.

Why didn’t strong banks improve their practices and lending earlier? It could be that stricter supervision forced them to overcome existing “agency frictions,” the research suggests. Banks may have been reluctant to recognize bad loans for a number of reasons—from friendships with locals to reputation concerns, or simply because bankers were comfortable with their practices and not eager to change them. Ultimately, stricter regulation forced banks to improve practices and lend more to entrepreneurs, which boosted local economies.

“Stricter supervision can increase bank lending even for well-capitalized banks, suggesting that its economic effects go beyond the capital channel,” write Granja and Leuz.—Alex Verkhivker


When stronger regulators step in

The research finds that banks increased their lending to small businesses after stronger regulators took over for the US’s Office of Thrift Supervision, which was dissolved in 2011 after being blamed for lax oversight.

### Originations of small-business loans

**Percentage difference from 2010 levels**

- **Banks that were regulated by the OTS**
- **Other US banks**

**Last full year before the OTS was dissolved**

- +60% (+$3.2 billion)
- +50%
- +40%
- +30%
- +20%
- +10%
- 0%
- -10%
- -20%
- -30%
- -40%
- -50%
- -60%

Originations in 2010

- $2 billion
- $115.3 billion

Granja and Leuz, 2017
Many companies in the United States and European Union complain that requiring them to publish audited financial statements is onerous and hurts economic activity. But defenders of the rules counter that such requirements help make markets more efficient.

Which is it? Research by Chicago Booth PhD candidate Matthias Breuer suggests that there may be good reasons to require financial reporting and auditing, but the efficiency argument doesn’t really hold up.

Public companies in the US and EU have reporting requirements, as do some private companies in the EU. Regulators and others in favor of such reporting argue that capital providers, customers, and suppliers can use accurately reported financials to better evaluate disclosing and related companies, benefiting everyone. Prior research suggests that these stakeholders may indeed make use of companies’ mandatory disclosures. (See “Should private companies be required to report their financials?” published online, June 2017.)

To study the efficiency argument in particular, Breuer exploited a natural experimental setup in the EU, where countries use size thresholds for establishing which small private companies will be exempt from full reporting and auditing requirements. He analyzed industry-level productivity and other metrics in 26 European countries from 2001 to 2015, comparing the effects of mandates on how resources are allocated within a given industry and country.

Making private companies report their full financial statements created more competitive markets, Breuer finds. He says that it drove more companies to open (although also to close), reduced market concentration, and lowered barriers to going public.

But he says the regulation didn’t necessarily make the market more efficient in terms of resource allocation—rather than grow the economic pie, it mostly changed the relative sizes of the pie’s slices. Customers, suppliers, and competitors stood to benefit from what would otherwise have been a company’s proprietary information. While the dissipation of proprietary information may have meant lower prices for consumers, it also appears to have discouraged companies from making productivity-enhancing investments. “Interestingly, greater competition as a result of mandatory reporting appears to stifle rather than spur productivity growth, at least for the typical firm in an industry,” he adds.

And Breuer finds that requiring audited statements deterred companies, particularly small ones, from starting up—imposing costs without producing corresponding industry-wide benefits. His evidence leaves him unconvinced that mandating audits is any better than making audits voluntary.

There may be reasons for governments to impose reporting and auditing mandates, perhaps to improve tax collection or fight money laundering, he writes. But when it comes to the efficiency of market-wide resource allocation, his evidence ultimately supports recent efforts by the EU to lessen smaller companies’ reporting requirements.—Marty Daks

REGULATORS: FOCUS ON SHADOW BANKING

“I would doubt very much that [future] stress would emanate from the banks directly. Most people would argue the shadow financial system is a place where there are risks building. Some of the risks hived off from the banks and went into the shadow financial system because we focus so much on regulating the banks. So my sense is that’s where we should be paying attention and trying to get a more even system of regulation. We probably have gone really far on the banks, maybe too far, but we haven’t done enough else—where to make sure that they are properly regulated.”

—RAGHURAM G. RAJAN of Chicago Booth speaking at Booth’s Economic Outlook in Chicago.

Go to Review.ChicagoBooth.edu to see citations for research mentioned in this article.

Do we need reporting and auditing mandates for private companies?

Pros and cons
Fuller financial reporting created more competition but hurt productivity growth.

Changes observed among companies after the EU toughened financial-reporting requirements
Percentage change from average for every 10 percent increase in the number of companies affected

| Product market entry | +4.1% |
| Product market concentration | −5.7% |
| Publicly listed companies | +16% |
| Number of shareholders | +3.3% |
| Labor productivity growth | −9.4% |

Breuer, 2017
Your research suggests that football and basketball teams avoid the risk of instant defeat, even if that risk could improve the chance of a win. How does this play out in daily life? Avoiding an immediate loss at the expense of one’s ultimate goal can happen outside of sports. Think of a struggling business, and imagine there is a strategy that provides a better chance of surviving in the long run but would increase the chance of going under right now. That business might be reluctant to take the risk.

Or think about cover-ups. There is an immediate cost to saying “I made a mistake.” But if you think through the consequences of a cover-up and the chance of getting caught, you might realize that fessing up right now gives you a better chance to get through the ordeal.

How can people counteract this tendency? People are focused on what’s happening right now and they’re more scared about losses than excited about gains. The myopia can be counteracted by taking a broader view. In sports, the goal is not to get to overtime; it’s to win the game. Force yourself into a broader perspective.

There’s another explanation for this tendency, a more magical-thinking one: risks you don’t have to take seem riskier than risks you have to take. So think, if this were your only option, how would you evaluate your chance of success and failure? Now with those estimates in mind, do you want to do it?
When ‘nudging’ is forever—the case of Sweden

Employers and policy makers have increasingly used default options in recent years to positively influence behavior, deploying one element of the “nudge” theory that won Chicago Booth’s Richard H. Thaler the 2017 Nobel Memorial Prize in Economic Sciences. When offering people program options, they include an automatic choice—the default that happens when people do nothing. A new employee doesn’t fill out forms to sign up for the retirement plan? No problem: that employee is simply enrolled in a predetermined default option. In this way, employers have vastly increased participation in retirement savings programs.

Once people are participating in a default option, they can stick with it for years, suggests research by Booth’s Thaler and University of Miami’s Henrik Cronqvist and China Europe International Business School’s Frank Yu, both graduates of Booth’s PhD program.

The researchers studied what happened when a Swedish government retirement savings program nudged the country’s working adults into a particular investment fund. The Swedish Premium Pension Plan, from 2000 through 2016, offered more than 7 million retirement savers a choice of 450-plus investment funds for their required paycheck deductions. Money from savers who didn’t make a choice went into a default fund, a low-fee option that mimicked a globally indexed equities fund. Savers who initially accepted the default were allowed to switch out of it at any time, but no investor was allowed to move money from other funds into the default fund. (This rule was changed in 2009.)

In addition, the government and fund sponsors initially used expensive advertising campaigns to prod investors to make their own choices. These campaigns fell off after 2001, once almost all eligible investors were enrolled.

Advertising, the researchers find, can override the power of the default option. In 2000, when the government encouraged people to be do-it-yourself portfolio managers and mutual-fund companies advertised pushing their own offerings, 67 percent of enrollees opted out of the default and picked their own portfolios. But the number of active choosers among each year’s new participants plunged, to 18 percent in 2001, and fell steadily thereafter. By 2016, 99 percent of new investors accepted the default.

As the ad campaigns faded, investors were reluctant to change their original choices, default or otherwise, even when circumstances presented good reason. “Participants seem to have a ‘set it and forget it’ mindset,” the researchers write. “When first confronted with a choice, they make a decision, and most fail to revisit it.”
Investors stayed with the default option even as the nature of the fund changed. In 2010, a regulatory change allowed the manager of the default fund to include as much as 50 percent leverage, greatly increasing investment risk. (The manager accomplished this by borrowing money to increase the equity exposure.) Very few default investors moved their money into other funds afterward, despite the availability of a fund that was almost identical to the original default.

People who actively chose their original portfolio also seemed reluctant to update their decision. Over 16 years, the median number of trades among this group was one per year, the study finds.

In the case of Allra funds, one of the offered choices, not even financial scandal or the ensuing government crackdown were enough to make investors move their money. In January 2017, journalists began reporting self-serving deals by company officials. The funds’ auditors resigned and reported questionable financial disclosures to authorities, and the Swedish government prohibited new investors from coming in. Even a month after Deloitte reported Allra to the authorities on March 16, 2017, and thereafter resigned as auditor, only 32 percent of the start-of-the-year investors had opted to divest.

The researchers make several recommendations based on the observed power of the default option and advertising. They suggest that the default fund return to a conservative, unleveraged global index fund, arguing that investors who want more risk should actively have to choose it.

The sheer number of fund options—there are almost 900 now—may overwhelm savers and make the default fund more attractive, the researchers suggest. If policy makers want more people to invest actively, reducing the number of funds might help.

But the researchers caution against extrapolating their findings to make broad generalizations about the staying power of nudges. They note that nudges range from default options to reminders to the size and color of a font on a form. The behaviors that nudges attempt to influence vary widely too. The stickiness of any nudge, they conclude, will depend greatly on the context.—Dee Gill


The findings contradict conventional wisdom among monetary-policy experts. A consensus proposes that large-scale asset purchases reduced 10-year Treasury yields by about 1 percentage point, as reported in the study. (Low bond yields stimulate growth by making borrowing cheaper.) Generally, most experts view lowering of bond yields as the gateway through which quantitative easing affects the US economy.

The study includes recommendations for the Fed to speed up its asset sales, and to avoid the practice of buying assets as economic stimulus in the future.

The researchers analyzed changes in bond yields each day the Fed made news, such as when the Federal Open Market Committee released minutes, or Fed governors gave policy-related speeches. This forward guidance, as it’s called, was a key component of the Fed’s strategy, designed to convince investors that the Fed would keep their bond investments safe with low inflation rates in the long run. The researchers also focused on days that years attributed a significant bond-yield move to news from the Fed.

Surprises by the Fed, such as its first announcement of quantitative easing, sparked immediate buying in the bond market, according to news reports and many studies. But yields tended to rise—investors sold bonds—the next time the Fed made news, according to Greenlaw and his colleagues. The researchers do not attempt to establish why, but they note one possibility: investors may have eventually decided that they had overreacted to the big news.

Events and announcements seemingly unrelated to the Fed sometimes moved markets even as the Fed was making news, the study finds. As an example, the researchers analyzed the infamous taper tantrum of 2013, when bond yields jumped after Fed Chairman Ben Bernanke indicated that the central bank would soon be winding down its asset purchases. They conclude that good news about the economy was a bigger trigger for that selling.

“Our overall conclusion is that the size of the Fed’s balance sheet is less potent in moving the bond market than as perceived by many and should not be viewed as a primary tool of monetary policy,” the researchers write. They suggest that the Fed stick to manipulating short-term interest rates, its traditional role in economic stimulus.—Dee Gill

Small economic losses can overshadow emotional ones

Say a reckless driver crashed into the property of a 70-year-old woman, causing significant emotional trauma. When seeking compensation, the woman shouldn’t mention that the crash also caused a small amount of financial damage, suggests research by Chicago Booth’s Christopher K. Hsee, Booth PhD candidate Shirley Zhang, and Northwestern’s Xueer Yu.

The researchers tested how much participants in a series of experiments would award a victim in various circumstances, including the reckless-driver scenario. The researchers found that scenarios in which a victim reported no financial damage drew compensation of $1,400, on average. But when the victim reported a small amount of damages, compensation was just $470.

In follow-up experiments, hypothetical victims received the greatest compensation when there was no physical or financial damage, only an emotional loss. Victims who had experienced $1 in financial damages actually received more compensation than those who had experienced $50–$60 in damages. However, victims who had several hundred dollars in damages were compensated more than those with no damage.

Citing a significant amount of financial damages can boost compensation; but, if the amount is small, it’s better not even to bring it up, the researchers conclude. They say that this reflects the “anchor” effect in behavioral economics, in which people pin their judgments about an uncertain quantity to a known quantity, even if disproportionately small.

“It would be better to say ‘I was so scared that I lost two nights’ sleep’ than to say ‘I was so scared that I lost two nights’ sleep and one day’s work,’” the researchers write. “If the victim mentions one day’s work, the mediator would likely compensate the victim for only her one day’s pay. If the victim does not mention one’s day work, the mediator would likely award more, unless the victim has a high-paying job and the judge is aware of it.”

Tort law allows victims to be compensated for purely emotional losses. But it’s important to understand the psychology of how the average person weighs emotional loss compared with financial loss, whether in court or out of court, the researchers write.

“[T]he fact that assessing psychological bias is difficult does not mean we can ignore it, or subsume it in a concurring economic loss,” the researchers conclude. “Emotional loss is real and ubiquitous. We hope this research will draw . . . the attention of the public to the potential neglect of emotional losses, especially in the presence of economic losses.”—Alice G. Walton


Financial losses sometimes not worth mentioning

Study participants granting compensation to victims gave more when a trivial amount of financial damages was under consideration but gave less when those damages grew a modest amount.

<table>
<thead>
<tr>
<th>Level of financial loss</th>
<th>Compensation awarded by study participants for a combination of emotional and financial loss (US dollars)</th>
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<tbody>
<tr>
<td>None</td>
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<tr>
<td>Trivial</td>
<td>$516</td>
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<tr>
<td>Small</td>
<td>$212</td>
</tr>
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</table>

Zhang et al., 2018

key insight

HOW TO CUSHION THE BLOW OF UNEMPLOYMENT

What’s more useful to people collecting unemployment insurance benefits: a bigger monthly check, or a longer benefits period? University of Chicago’s Peter Ganong and Chicago Booth’s Pascal Noel analyzed data from more than 200,000 US households affected by unemployment. They find spending dropped sharply when people first lost their jobs, and again when insurance payments ran out. They calculate that extending benefits is three to four times more effective for stabilizing spending among the unemployed than raising monthly benefit levels.—Áine Doris

How powerful are online aggregators?

There’s some concern in policy circles about the market power of online aggregators, which can influence what information consumers access. Google, for example, is best known as a search engine but has also become a prominent aggregator of news and travel offerings.

But a study by University of Zurich’s Selin Akca and Chicago Booth’s Anita Rao suggests that aggregators’ influence can sometimes be overstated.

The researchers looked specifically at travel aggregators, arguably a modern incarnation of travel agents. What’s the cheapest price on a flight to Tokyo, or a nice, midrange hotel in Geneva? To find out, travelers often go to sites such as Expedia, Kayak, or Orbitz.

It’s widely understood that aggregators and travel companies share a mutually beneficial relationship. But in the airline-aggregator relationship, which party has the upper hand?

Akca and Rao examined browsing data from the analytics company comScore, which provided access to about 30,000 users per year who visit travel websites. They also analyzed airline data, from the Bureau of Transportation Statistics, a 10 percent sample of airline tickets from reporting carriers. The data included origin, destination, and other itinerary details of travelers, who traveled on 37 airlines and through 500 airports.

Most people not only use aggregators; they start their search with them, and only then visit the airline domain to make a purchase. (This isn’t true for Southwest, which bypasses aggregators and whose fliers book directly with the airline.) This suggested to Akca and Rao that customers, while researching, visit aggregator sites they presume offer a comprehensive look at the available options.

The researchers then looked at how consumers reacted when two large aggregators were temporarily unable to display flight information and fares from a leading carrier. Between December 2010 and June 2011, due to a fight over distribution fees, Orbitz didn’t show American Airlines’ flight offerings. Expedia also delisted American flights for three months during this time.

When they weren’t displaying American fares, Orbitz and Expedia saw a significant drop in visits and browsing compared to other travel websites, find Akca and Rao. American’s site did not see a change in its visits. During the dispute, Orbitz saw a 3 percent decline in purchases. The researchers conclude that shoppers who sense the service is less than comprehensive could stop using aggregators, as they did during the American dispute.

Overall, the findings appear sobering to see a longer version of this article.
When investors consider the liquidity of a stock portfolio, they are usually interested in how readily the underlying holdings can be bought or sold. For example, a portfolio of large-cap equities, or heavily traded stocks of big companies, is generally considered to be more liquid than a portfolio of small-cap equities, or lightly traded stocks of small ones. Although the focus on the average liquidity of the portfolio’s holdings is largely correct, it paints an incomplete picture, according to research by Chicago Booth’s Lubos Pastor and University of Pennsylvania’s Robert F. Stambaugh and Lucian A. Taylor. The portfolio’s construction matters too.

Analyzing 2,789 actively managed mutual funds between 1979 and 2014, the researchers find that fund portfolios have become more liquid over time, largely as a result of becoming more diversified. Both components of diversification—balance and coverage—have risen sharply, especially since 2000. The level of coverage rose faster than the level of balance as mutual-fund managers poured ever more names into their portfolios.

The research captures the rise of closet indexing among active-mutual-fund managers, a phenomenon that may be caused by managers hewing toward the benchmark they are trying to outperform. While diversification has some benefits in terms of risk management and liquidity, the close resemblance of active portfolios to passive indexes might leave some investors wondering why they’re bothering to pay for active management given the ubiquitous availability of cheap, passive alternatives.

When evaluating mutual funds, many investors look first at performance, even though this is inherently backward-looking. They might want to look instead at several other characteristics as a “richer source of insights into the economics of mutual funds,” say Pastor, Stambaugh, and Taylor.

The researchers find four characteristics of particular interest—portfolio liquidity (see infographic at right), fund size, expense ratio, and turnover—all of which appear to be closely related. Larger funds have lower expense ratios. Funds with lower turnover are larger and, again, have lower expense ratios. “Funds with more liquid portfolios should be larger and cheaper, and they should trade more,” write the researchers.

A fund’s size relates not only to its expense ratio but also to the other two fund characteristics. Specifically, larger funds have lower turnover and higher portfolio liquidity. Because of their size, larger funds cannot afford to trade too much, or to hold an illiquid portfolio—an indication of diseconomies of scale in active investing. But the size handicap can be partially overcome by skill.

“A more skilled fund can make more effectively offset higher trading costs associated with a less liquid portfolio,” the researchers write. For example, a fund with a skilled manager “can afford to concentrate its portfolio on its best ideas or to trade its less liquid stocks, which are more susceptible to mispricing.”

In the data the researchers analyzed, smaller funds tended to be more expensive, with lower turnover and less liquidity. Funds that traded less tended to be cheaper, but only when they were larger. The rub, though, is that excessively large funds tended to underperform, implying a limit to the benefit investors get from economies of scale.

By looking into these characteristics, investors can better evaluate what a given mutual fund is offering. There’s little point in paying a premium fee for a large fund with liquid holdings, after all. A small fund may be worth its price if the manager has requisite skill. Fund characteristics will also change over time. Fees should drop as asset levels climb, for example, but performance could well fall. —Michael Maiello

FOUR TOOLS INVESTORS CAN USE TO EVALUATE MUTUAL FUNDS

Liquidity of mutual funds’ stock portfolios

Investors should see lower trading costs with a mutual fund that has greater portfolio liquidity, which the researchers define as being more diversified and trading more-liquid stocks. This sequence of charts illustrates how they use a combination of custom portfolio characteristics to construct a measure of portfolio liquidity.

The number of stocks in the average mutual fund continues its rise . . .

. . . even though the number of stocks in the market has dropped.
... and assign weights that increasingly resemble their market benchmarks.

Balance: How close the fund’s portfolio weights are to market-capitalization weights (100%)

So mutual fund managers are ramping up the diversification of their portfolios...

Diversification: How closely the fund’s stock holdings and weights match those of its benchmark (100%)

... even as the liquidity of their funds’ individual stock holdings has declined.

Stock liquidity: Market capitalization of the fund’s average stock holding relative to that of the benchmark

Mutual fund managers hold stocks that cover more and more of the market...

Coverage: Percentage of benchmark stocks held by the fund
Mutual funds’ portfolio liquidity approximately doubled between 1980 and 2000... but has been relatively stable since 2000, with the rise of diversification countering the drop in stock liquidity.

Combined, these characteristics give investors a picture of liquidity at the portfolio level. Portfolio liquidity: Indicator of the portfolio’s trading costs, given the fund’s size and turnover (100% = most liquid, with lowest trading costs).

The 300 secrets* to high stock returns
*Caveat: Most of them probably won’t work
Has the hunt for investable factors gone too far?

BY MICHAEL MAIELLO
ILLUSTRATIONS BY EIKO OJALA
Fidelity, Vanguard, and BlackRock all offer online explainers of factors, and BlackRock has a head of factor-based strategies who proclaims on the company’s website that “factor investing is the way of the future.” “Institutional investors and active managers have been using factors to manage portfolios for decades,” reads BlackRock’s pitch. “Today, data and technology have democratized factor investing to give all investors access to these historically persistent drivers of return.” BlackRock’s site features an infographic that highlights 12 factors of importance, divided into two categories: macroeconomic (capturing broad risks across asset classes) and style (explaining returns in just one asset class).

And many dozens more are circulating, presumably keys to greater investment returns. Duke’s Campbell R. Harvey, Texas A&M’s Yan Liu, and University of Oklahoma’s Heqing Zhu have identified more than 300 factors in academic literature. City University of Hong Kong’s Guanhao Feng (a recent graduate of Chicago Booth’s PhD Program), Yale’s Stefano Giglio, and Booth’s Dacheng Xiu have collected and investigated over 100 of them—ranging from employee growth to maximum daily return.

But has the hunt for investable factors gone too far? Feng, Giglio, and Xiu are suggesting that it has. On one hand, factors are helpful. If an investor wants to have a truly balanced portfolio, she should do more than make sure she owns both stocks and bonds, and in theory she can use factors to make sure her investments truly represent a diverse basket of assets whose returns are driven by different things. But are there really 300 separate characteristics associated with higher asset returns, or only a handful of things really driving stock prices? The hundreds of factors that appear in academic research are based on many possible company characteristics, which could, in theory, capture many types of risk. However, Feng, Giglio, and Xiu are skeptical that all these factors are useful. Two portfolios that look different from each other—for example, one that overweighs small companies and another that is heavy on illiquid companies—could end up giving investors exposure to the same underlying risk. That is, many of these factors may be redundant. Is the factor industry an example of a good idea that has gone too far?

Factors 101
Before there were 300 factors, there was just one, kind of. The original factor—or the forerunner of factor analysis—is, in a sense, the capital asset pricing model. Largely developed by Stanford’s William F. Sharpe, who was awarded the Nobel Memorial Prize in Economic Sciences in 1990, the CAPM posits that investors are paid for both the time value of their money and the risk they assume in
holding an asset. The model has helped investors determine how much compensation they should demand for holding a risky asset.

The formula is not reliably predictive. It generates an expected return on assets based in part on the beta of a security, or its covariance with the market. Some research on the CAPM has suggested that low-beta stocks tend to have higher returns than predicted, while higher-beta stocks do not live up to expectations. Still, some finance professionals refer to the CAPM as “the one-factor model,” where market beta is the sole explanatory factor of expected returns.

In 1992, expanding on the CAPM, Chicago Booth’s Eugene F. Fama and Dartmouth’s Kenneth R. French published a three-factor model, identifying two more things that generate returns: size and value. They observed that small-cap companies outperformed large-cap ones over time, and companies with low price-to-book ratios outperformed companies with higher price-to-book ratios.

Investors generally accepted the Fama-French three-factor model, yet it still seemed incomplete to many adherents of Fama’s efficient-markets hypothesis. If markets are efficient and assets priced accordingly, a return is the compensation an investor receives for taking on some risk by holding an asset. Factors capture this risk, so when investors take on exposures to certain factors in their portfolios, they earn a risk premium as compensation. But some mutual-fund managers consistently outperformed or underperformed market benchmarks. Were they taking on risks beyond just three? The natural inclination of an efficient-markets believer, when confronted with an outperforming manager, is to assume that the manager is taking on and being paid for unquantified risks that are driving the asset returns. In 1997, Mark Carhart, who founded Kepos Capital, published an article that suggested momentum as a fourth factor.

Between this point and 2016, researchers developed another 300 factors, some of which are based on the idea that investors’ biases and behaviors can affect asset prices. Take momentum, where the recent direction and slope of stock returns is used to predict a stock’s future returns. When behavioral economists contributed some factors, that caused some debate about whether some of those factors were still grounded in the efficient-markets hypothesis. (Chicago Booth’s Richard H. Thaler argues that there are a number of “supposedly irrelevant factors” that influence people’s investment- and noninvestment-related decisions. For more on this, see “Behavioral economics from nuts to ‘nudges,’” page 47.)

Even Fama and French contributed to the growing pile of factors. In 2013, Fama was awarded the Nobel Memorial Prize in Economic Sciences for his work on asset pricing. Less than two years later, he and French came out with research in which they suggest two more explanatory factors in stock returns: profitability (high-earnings-growth companies get higher returns) and investment (companies with high total asset growth typically generate lower-than-average returns).

Competition within academia is fueling a rush to discover or develop new factors for publication, says Fama. “You have thousands of academics in this area, all of whom need to come up with papers to publish, so the door is open wide.”

"We're not saying those 300 factors are fake. It may be true that some deliver significant risk premia for investors. But they could also be simply duplicating a few other important factors."

— DACHENG XIU, CHICAGO BOOTH
Close the barn door
But there’s now a notion that it’s time to partially close this door, or at least make sure researchers test new factors vigorously, using international stock market data and at least relating the intuition behind the factors to economic models, such as the dividend discount model.

Feng, Giglio, and Xiu suggest that many touted discoveries are mere subsets of the original three, or the more recent five, or perhaps a few other already-discovered factors. This redundancy can be tough for researchers to spot.

Just as investors evaluate a mutual fund or hedge fund by comparing it to a benchmark index, researchers evaluate a new factor by comparing it to a benchmark factor model, to see if it produces an extra return. If researchers omit important factors from the model, new factors may appear to be useful, even though they may be simply replicating the ones that were omitted.

For example, size (as measured by a company’s market capitalization) is a long-accepted factor and component of stock returns. Small-capitalization stocks tend to outperform large-cap stocks over time. This suggests an investor who takes on extra risk by investing in smaller companies receives compensation for doing so.

But small-cap companies also tend to be less liquid than large-cap ones. So it’s reasonable to suggest that liquidity might also be a factor in returns, and our investor is also being compensated for holding less-liquid, and therefore riskier, assets. But in the case of stocks, these researchers hypothesize that liquidity may stand alone as a factor or it may, in fact, simply be the size factor with a different label.

“We’re not saying those 300 factors are fake,” says Xiu. “It may be true that some deliver significant risk premia for investors. But they could also be simply duplicating a few other important factors.” Xiu and his colleagues argue that many of these factors are either useless or account for return variations that have already been explained. “We think many of these newly proposed factors are redundant and are the result of somewhat arbitrary choices of existing factors as controls— one form of abusive data mining,” they write.

How factors stack up
The researchers find that fewer than one proposed factor out of five offered a new, statistically significant explanation of stock returns.

Factors that would have passed the researchers' test
Sample of new factors introduced each year, 1994–2016

Momentum factor
The first in the 23-year sample that the researchers’ test finds to be a statistically significant addition to existing factors.

Volatility of dollar trading volume
Change in tax expense
Corporate investment
Financial statement performance


Feng et al., 2017
Torturing the data

Such mining may be prompted by the requirements of journals. Goodhart’s law, named after London School of Economics’ Charles Goodhart, says that “when a measure becomes a target, it is no longer a measure.” This could be what’s happening as factor hunters search too strenuously for factors that will adhere to the measures journals require for publication.

Specifically, journals require a new factor to have a probability value (P value) of less than 5 percent, meaning that a test shows that the factor will give off false positives fewer than 5 percent of the time. Since factor foragers can target the P value, they are susceptible, consciously or not, to data dredging and mining (presenting patterns within data as statistically significant without presenting a hypothesis to explain causality) or outright P-value hacking (setting up the sample to get the desired result).

“There is a saying that if you torture the data enough, eventually they will surrender,” says Xiu.

Most of the existing research papers that propose a new factor compare it to an existing benchmark, such as the Fama-French three-factor model, and find that their new factor is
WHY EXPLAINING STOCK RETURNS REMAINS SO COMPLEX

In the academic literature on predicting asset values, researchers have proposed hundreds of factors to explain an individual stock’s return.

Some researchers argue in favor of reducing the number of factors to a handful, the economic equivalent of searching for elementary particles in physics. But on the physics side, things did not get simpler as they got smaller, and they might not in finance either, suggest University of Michigan’s Serhiy Kozak, Chicago Booth’s Stefan Nagel, and University of Maryland’s Shrihari Santosh, who argue that the quest for simplification, while well-meaning, may be misguided.

“Our results suggest that the empirical asset-pricing literature’s multi-decade quest for a sparse characteristics-based factor model (e.g., with 3, 4, or 5 characteristics-based factors) is ultimately futile,” the researchers write.

They constructed a stochastic-discount-factor model, which pins down the factors that allow investors to earn a return premium—to analyze the predictive power of a large number of stock-return models. Factors in these models are attributes of companies or stocks that help explain a security’s performance. Size as a factor, for example, tells us that companies with small market capitalization outperform large-cap companies. Stocks with low price-to-book ratios outperformed stocks with high ratios, and so forth.

The five-factor model proposed in 2016 by Chicago Booth’s Fama and Dartmouth’s French represents such a stochastic-discount-factor model focusing on size, value, profitability, investment patterns, and market risk. But Kozak, Nagel, and Santosh argue that there is not enough redundancy to whittle things down to a handful of predictive factors.

The term “redundancy” has to do with factors that have different names but the same explanatory power. For example, a researcher might propose an “emerging-markets factor” that shows stocks in emerging markets outperform those in developed markets. But the same effect might be better explained by the size factor; as emerging-markets companies tend to have lower market capitalization than those in developed markets.

They test this and find that models based on a limited number of factors, including Fama-French from 2016, are not able to fully explain equity returns between 2005 and 2016. There must be something more at work, they suggest.

“Sparsity is elusive,” the researchers write. A model must include many factors to be complete. While they say they believe there is some redundancy out there within the world of factors, they suggest that models based on a half dozen or fewer factors will never fully explain stock returns. Complexity, they might say, is the most resilient factor of them all.—Michael Maiello


useful in explaining more variation in the expected return across stocks. But if researchers consistently compare their new factors to the same benchmarks, and not to other newly discovered factors, it’s possible they essentially keep “discovering” the same factor again and again but give it different names.

Alternatively, some researchers, instead of using the Fama-French factors as a benchmark, pick an arbitrary factor that makes their results look significant.

Xiu and his coresearchers instead propose using the entire set of existing factors (the factor zoo, as some finance academics have termed it) as a benchmark for newly proposed factors—a more robust way to test whether or not newly proposed factors really bring something new to the table. Thus, old factors could help determine if newly proposed factors are just old ones in fancy repackaging.

The researchers say the challenge of using the entire zoo is the curse of dimensionality, a well-known problem that could render standard methods used to evaluate new factors (such as a simple linear regression) infeasible to apply. To counteract this, they propose using a machine-learning method to select the best benchmark.

Using this method, they analyzed 99 factors, pitting factors discovered in 2010 and later against those published earlier to determine which newer factors are truly new. They find that a few of the newly proposed factors do seem to have some utility, notably the profitability and investment factors proposed by Fama and French, while many others fall short. Feng, Giglio, and Xiu find that 13 of the 99 factors hold some explanatory power, which is enough to keep the factor hunt going, but also a result that suggests using skepticism when assessing the hundreds of factors in the academic literature.

Developing more rigorous factors
Econometrics researchers have been testing and refining asset pricing models since the 1970s, but Feng, Giglio, and Xiu focus on newly proposed factors. They believe that the existing approach to finding factors will inevitably lead to mistakes or a proliferation of ideas that aren’t fully vetted.

“What we are trying to do is to propose a statistical methodology that can tame the factors or anomalies, and we suggest a more robust approach in trying to identify an important one,” says Xiu.

He says that the techniques they use to evaluate factor efficacy could be applied to mutual-fund and hedge-fund portfolios, so that investors would be able to quantify the sources of returns generated by their managers. For example, a portfolio manager investing in frontier markets might identify the risks associated with emerging economies as a factor that drives returns. However, if those frontier-market companies are also smaller than most, or undervalued, it might really be the size or value factors driving returns.
Researchers find that 13 of 99 factors hold some explanatory power, which is enough to keep the factor hunt going, but also a result that suggests using skepticism when assessing the hundreds of factors in the academic literature.

“There may be many different smart beta portfolios out there that seem distinct but are actually taking on the same risk,” says Xiu.

Another item of interest is whether or not a factor’s persistence is affected by its use. It could be that a factor’s wide adoption undermines its utility, as people crowd into previously unknown trades. Momentum, for example, is a well-established factor prone to such reversals. Price momentum can attract investment dollars that are abruptly withdrawn once the price of a stock has appreciated.

Feng, Giglio, and Xiu want to apply machine learning to asset pricing apart from taming factors or anomalies. After all, if the factor industry is one example of the finance profession cycling out of control, it probably isn’t the only one.

Go to Review.ChicagoBooth.edu to see citations for research mentioned in this article.
How to be happy without earning more

For people blessed with plenty, research offers ways to maximize satisfaction

BY JOHN WASIK  ILLUSTRATIONS BY BEN WISEMAN
inland sits at the top of the United Nations’ 2018 World Happiness Report, which ranked more than 150 countries by their happiness level. The country that gave the world the mobile game Angry Birds scored high on all six variables that the report deems pillars of happiness: income, healthy life expectancy, social support, freedom, trust, and generosity. News reports touted Finland’s stability, its free health care and higher education, and even the saunas and metal bands for which it’s famous. But some also pointed out that Finland’s GDP per capita, at $43,000, is lower than in some other countries; GDP is $57,000 in the United States (happiness report rank: #18) and $71,000 in Norway (#2). “The Finns are good at converting wealth into wellbeing,” Meik Wiking of the Happiness Research Institute in Denmark told the Guardian.

Yet abundance does not equate to happiness, according to research—even on a longer time frame. In most developed countries, the average person is rich by the standards of a century ago. Millions more people have access to safe food, clean drinking water, and in most cases state-funded health care. And in countries with a growing middle class, millions more are now finding themselves able to purchase big-screen televisions, smart phones, and cars. But this growth in wealth hasn’t made people happier, University of Southern California’s Richard A. Easterlin first argued in 1974. In January 2016, after researchers challenged what’s now known as the Easterlin paradox, he reexamined the data and concluded that it still stood—worldwide long-term trends in happiness and real GDP per capita were largely unrelated.

People, it appears, want more than money. Some of what they want, such as free health care and living free from corruption, is determined on the social and governmental level—and helps explain why Nordic countries dominate the top spots of the worldwide happiness rankings. But there’s still hopeful news for citizens of the United Kingdom (#19), France (#23), Brazil (#28), Saudi Arabia (#33), China (#86), and elsewhere. Research suggests that it is within people’s power as individuals to achieve more happiness. Chicago Booth’s Christopher K. Hsee is a behavioral scientist focusing on what he calls hedonomics, derived from the Greek word *hedone*, or pleasure. Hsee views hedonomics as a counterpoint, or complement, to economics. Rather than studying how to produce more “stuff,” hedonomics studies how to extract more happiness from the existing stuff.

“Our ancestors had to work to accumulate enough to survive. But now productivity is so high, we don’t need to work so hard for survival,” Hsee says.

The pursuit of happiness

Long before Thomas Jefferson embedded “the pursuit of happiness” into the Declaration of Independence, classical philosophers such as Socrates, Aristotle, Buddha, and Confucius waxed lyrical about how to achieve happiness. In the early 20th century, Sigmund Freud posited that a driving force to seek pleasure was rooted in the id, the most animalistic part of human nature. Viktor Frankl, an Austrian neurologist and psychiatrist, argued that people want more than basic pleasure; they want meaning and purpose in their lives.

The more recent studies of happiness are both more precise and perplexing. Empirical studies have explored what makes us happy. Is it experiences? Time? Princeton’s Daniel Kahneman and Angus Deaton, both Nobel laureates, in a 2010 study find that annual income and day-to-day emotional well-being were correlated only until around $75,000. After that point, increasing income produced no more emotional well-being—leading the researchers to conclude that high income doesn’t buy happiness. “During the past 10 years we have learned many new facts about happiness. But we have also learned that the word happiness does not have a simple meaning and should not be used as if it does,” notes Kahneman in his 2011 book, *Thinking, Fast and Slow*. “Sometimes scientific progress leaves us more puzzled than we were before.”

‘When we have lots of stuff, the priority is not how to accumulate more stuff, but how to convert the stuff into happiness.’

— CHRISTOPHER K. HSEE, CHICAGO BOOTH
Researchers now study different kinds of happiness, and their work falls into essentially two camps. One focuses on overall well-being, or life satisfaction, which can involve factors such as money, religion, politics, culture, and marriage. The other looks at shorter-term happiness derived from consuming certain things. This is the branch that includes hedonomics, as well as more general judgment and decision-making. Chicago Booth's Richard H. Thaler, a Nobel laureate, coined the term “hedonic editing” in the 1980s, when he started to explore how people could make decisions to maximize their happiness—for example, by spreading out fun events over time but scheduling unpleasant ones back-to-back.

A 2005 paper by University of Central Florida’s Peter Hancock, Aaron A. Pepe, and Coventry University’s Lauren Murphy was one of the first to use the term “hedonomics,” which originally referred to the study of ways to interact with machines, a still-topical issue as automation and artificial intelligence merge.

Hsee and his Chicago Booth colleague Reid Hastie redefined the term in 2008. Their version of hedonomics is premised on the idea that people don’t need more resources to be happier; they need to use existing resources differently. For example, suppose a child initially enjoys playing with wooden blocks but grows tired of them. Hedonomics suggests the child doesn’t need more blocks to be happy; she needs to change how she plays with those blocks.

If not blocks, say a person has 20 pieces of chocolate. To optimize happiness, consume them over several days, not all at once, explains University

**Six keys to happiness**

The United Nations’ annual World Happiness Report incorporates quality-of-life factors beyond money to measure global happiness.

**Ranking of happiness by country, 2015–17**

*Measure based on survey data*

<table>
<thead>
<tr>
<th>Major components of happiness score:</th>
<th>GDP per capita</th>
<th>Healthy life expectancy</th>
<th>Social support</th>
<th>Freedom</th>
<th>Trust</th>
<th>Generosity</th>
</tr>
</thead>
</table>

**Top 10 countries**

1. Finland
2. Norway
3. Denmark
4. Iceland
5. Switzerland
6. Netherlands
7. Canada
8. New Zealand
9. Sweden
10. Australia

**Bottom 10**

147. Malawi
148. Haiti
149. Liberia
150. Syria
151. Rwanda
152. Yemen
153. Tanzania
154. South Sudan
155. Central African Republic
156. Burundi

Helliwell et al., 2018
of Florida’s Yanping Tu, a recent Chicago Booth PhD graduate. The same principle applies to experiences. Instead of binge-watching a TV show, watch two episodes per day. Or better yet, apply a more sophisticated method: say you have six episodes to watch. You could watch two a day, or you could watch one on the first day, two on the second day, and three on the third day. That’s an improving sequence. Or you could do the reverse, in a decreasing sequence, by watching three at the start and winding down.

“Hedonomics would suggest you take the first approach, arrange consumption in improving order,” says Tu.

Instead of optimizing their resources, many people instead seek to add resources. Hsee, who has devoted much of the past decade to researching hedonomics, says that can backfire and lead to a phenomenon known as the “hedonic treadmill.” This phrase, coined in 1971 by the late Philip Brickman of Northwestern University and the late Donald T. Campbell of Lehigh University, refers to the psychoeconomic version of a rat race.

Hsee, who grew up in China, recalls when “just having the ability to buy a cheap bicycle” in his city was a big deal. But by 2012 in China, according to the UN World Happiness Report, “virtually every urban household had, on average, a color TV, air conditioner, washing machine, and refrigerator. Almost nine in ten had a personal computer, and one in five, an automobile.” Hsee sees his friends, some now able to afford expensive cars, stuck on the hedonic treadmill as they seek to maximize their well-being.

The problem is that it takes more and more things to make people happy. In a recent study, for example, Hsee and recent Booth PhD graduate Raegan Tennant find that upgrading the screen size of an e-reader from medium to large made people happy initially, but over time the happiness faded. (See “Why a bigger house doesn’t always make you happier,” page 40.)

Invest in needs, not wants
The hedonic treadmill fires up because people misunderstand what will actually make them happy, research suggests. People gain more happiness when they satisfy their inherent rather than learned preferences—needs rather than wants.

Hsee and a group of researchers—University of Florida’s Yang Yang, Shanghai Jiao Tong University’s Naihe Li, and Chinese University of Hong Kong’s Luxi Shen, a graduate of Booth’s PhD Program—interviewed residents from 31 Chinese cities during one winter, asking how they felt about the temperature of their homes as well as the jewelry they owned. Home temperature was meant to signify an inherent preference, more of a biological need, whereas jewelry represented a preference developed in a cultural and social context. These learned preferences drive why someone might pick a French wine over a California wine, or a Gucci over a Coach bag.

When it came to inherent preferences, warmer room temperatures in the winter made people happier. This was true both within a given city and across cities: for example, within Tianjin, people with warmer home temperatures were happier—and on average, residents in Tianjin, where most homes were heated, were also happier than residents in Nanjing, where home heating was less prevalent.

But when it came to learned preferences, more expensive jewelry made people happier only within a given city, not across cities. Within Nanjing, people with more expensive jewelry were happier, but the average resident of Nanjing, who owned more expensive jewelry, wasn’t any happier than the average resident of Lanzhou, who owned less expensive jewelry.

What sets the top 10 apart
GDP and social support explain more than half the difference between the top and bottom 10 countries in the 2018 World Happiness Report.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Difference between Top 10 and Bottom 10 Countries</th>
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<tbody>
<tr>
<td>GDP per capita</td>
<td>33%</td>
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<tr>
<td>Social support</td>
<td>28%</td>
</tr>
<tr>
<td>Healthy life expectancy:</td>
<td>19%</td>
</tr>
<tr>
<td>Freedom</td>
<td>12%</td>
</tr>
<tr>
<td>Trust</td>
<td>7%</td>
</tr>
<tr>
<td>Generosity</td>
<td>2%</td>
</tr>
</tbody>
</table>

Note: Chart doesn’t add up to 100% because of rounding.
Helliwell et al., 2018

GDP and social support explain more than half the difference between the top and bottom 10 countries in the 2018 World Happiness Report.
“How warm the temperature is in relation to your happiness is absolute; it does not require social comparison. By contrast, how much jewelry makes you happy is relative; it requires social comparison,” Hsee says. A person is unlikely to compare herself to someone halfway across the world, but her envy and unhappiness are likely to increase if her immediate neighbors possess more than she does.

And the happiness generated by fulfilling needs lasts longer. Tu and Hsee asked people to recall a purchase—durable, and between $50 and $500—that they’d made in the previous year. Then the researchers asked how happy people had been after making the purchase, and how happy they were at the moment of the study. Regardless of which preference the purchase satisfied, inherent or learned, people’s happiness declined over time—but it was more persistent if the purchase satisfied an inherent preference.

Balancing needs with wants can take many forms. Say a person has some money to spend and already has a heated home. In that case, should she buy jewelry and handbags, or invest in something else such as a shorter commute? Some research suggests that time gained or lost in commuting is closer to a need than a want. University of Basel’s Alois Stutzer and Bruno S. Frey find that people who commuted long hours had higher incomes, but in terms of happiness, the extra money didn’t compensate for the time lost.

“Each of us has only a fixed amount of time available for family life, health activities, and work. Do we distribute our time in the way that maximizes our satisfaction? The answer, I believe, is no,” writes USC’s Easterlin. “We decide how to use our time based on a ‘money illusion,’ the belief that more money will make us happier, failing to anticipate that in regard to material conditions the internal norm on which our judgments of well-being are based will rise, not only as our own income grows, but that of others does as well. Because of the money illusion, we allocate an excessive amount of time to monetary goals, and shortchange nonpecuniary ends such as family life and health.”

Slow down
Most people obviously move to satisfy their needs first and then, after those are met, move to satisfy their wants. After all, once you have a heated home, why not want the Gucci bag? The problem is that the happiness that people get from addressing needs lasts longer than what they get from addressing wants, leading to a state of regular dissatisfaction. In this way, instead of turning off the treadmill, many people turn it up, and can find themselves in a mode that compromises their family life, health, and well-being. The person looking at his kitchen may feel the need to upgrade the granite, developing something of a countertop addiction and losing a sense of what he really wants to achieve in life.

He may also develop a tendency to overearn. As happiness from material stuff fades, people may work excessively to buy more things—even when they have more than enough money to live a comfortable life.

In a study, Hsee, University of Miami’s Jiao Zhang, Shanghai Jiao Tong University’s Cindy F. Cai, and Booth PhD candidate Shirley Zhang asked people to listen to noises such as wood being sawed. This, in the research design, was equivalent to work. Study participants had to press a button to hear the sounds, which simulated doing work people don’t particularly enjoy. Study participants earned chocolates for the length of time they worked.

Less of a decline
Assessing people’s happiness with significant purchases, the research reveals more staying power in fulfilling needs rather than wants.

How study participants rated purchases that satisfied different preferences
Happiness scale: 1–7

<table>
<thead>
<tr>
<th>Needs</th>
<th>Wants</th>
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<tbody>
<tr>
<td>Inherent</td>
<td>Learned</td>
</tr>
<tr>
<td>preferences</td>
<td>preferences</td>
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<tr>
<td>Happiness at time of purchase</td>
<td></td>
</tr>
<tr>
<td>Current level of happiness</td>
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</tbody>
</table>

Tu et al., 2018
After this earning period, the participants entered a consumption period, during which they could eat all of the candy they’d just earned. They were told that they weren’t allowed to take any chocolates home, however—which created essentially a version of life where people can’t take earnings with them to the afterlife or pass them down to their children, Hsee says.

Many participants earned more chocolates than they could eat in the time allotted, particularly if they had been designated high earners and had to press the noise button just 20 times (as opposed to 120 times) to earn a piece. This group earned almost 11 chocolates on average but ate just four of them. After four, they’d generally eaten all they wanted, so they literally left the remaining chocolates on the table upon leaving.

“Using this paradigm, we found that individuals do overearn, even at the cost of happiness, and that overearning is a result of mindless accumulation—a tendency to work and earn until feeling tired rather than until having enough,” the researchers write. However, when participants were told that they could continue to work but would not earn more chocolates, they stopped sooner and felt happier, the research finds, suggesting that imposing an earning cap could reduce overworking and increase happiness. Hsee sees a parallel in real life, where productivity has enabled many people to work less for roughly equal pay, and yet they don’t take advantage of this and instead continue to work rather than relax.

Promote curiosity
Curiosity can also help, as people find pleasure in discovering enlightening detours and unexpected adventures. When they stop and ponder something new, or take on projects that increase their knowledge, this can facilitate greater happiness.

Hsee says that research with University of Wisconsin-Madison’s Bowen Ruan and Zoe Y. Lu reveals a nuance in the relationship between curiosity and happiness. In one study, people presented with new, interesting facts reported higher levels of satisfaction if they were asked questions but not immediately provided the answers. The process of discovery proved important.

One curiosity experiment had two set-ups. In the first set-up, researchers told study participants that only humans and certain whales experience menopause. In the second, the researchers asked which animals the participants thought were affected by menopause, prompting the participants to think before receiving the answer. The people in the latter situation reported higher levels of satisfaction, apparently happiest when curiosity was stoked and soon resolved.

Hsee says he applies this finding in his teaching by asking students questions and giving them time to ponder before supplying answers. Children also benefit from learning to appreciate the power of curiosity, he says, suggesting individuals can put this finding to work for them, for example by reading questions about art before visiting a museum, or by reading questions about a new city before heading there. In this way, hedonomics teaches, tourists can extract happiness from a vacation to, say, Paris without having to visit more cities.

Limit your choices
According to traditional economic theory, more choices are always preferable to less. But hedonomics indicates that more choices may lower happiness and rev up the hedonic treadmill.

London Business School’s Simona Botti and Hsee ran a series of experiments in which they offered a number of people in a group more choices,
WHY A BIGGER HOUSE DOESN’T ALWAYS MAKE YOU HAPPIER

Some lottery winners have learned that a jolt of happiness doesn’t necessarily last. In a particularly tragic case, Billie Bob Harrell Jr. won $31 million in the Texas lottery in 1997 but committed suicide two years later after saying that winning the lottery was “the worst thing that ever happened to me.”

While Harrell provides an extreme case study in the perils of sudden riches, researchers have been studying how long happiness sticks around—or evaporates—after a change such as a lottery win. According to ideas42’s Raegan J. Tennant, a graduate of Chicago Booth’s PhD Program, and Booth’s Hsee, happiness will endure the closer it comes to helping a person meet an objective need or cross a defined threshold. Once the threshold is crossed, and the further away someone gets from that point, happiness due to sudden riches or another positive change is more likely to decay.

For several decades, psychologists have been studying hedonic durability, or how long happiness sticks around after a change. Tennant and Hsee investigated this by looking at how long happiness (or unhappiness) lasts in cases involving an objective variable—such as readable type size.

The researchers designed a study using various sizes of e-readers, including some with small screens on which the type was harder to read. In one experiment, they asked participants to read from two devices. Some read on a relatively large screen before switching to a medium-sized one. Others started on a medium-sized one and then moved to something smaller. They generally read for about two minutes on the first device and around 10 minutes on the second. At various points, the participants answered questions about what they were reading and how happy they were with the experience.

The researchers observed that everyone was initially unhappy moving to a smaller screen, but the unhappiness persisted only for people who were downgraded to the smallest screen. Similarly, in another experiment that involved people reading on devices of increasing size, the upgrade led to longer-lasting happiness only for people who started on the smallest screens.

These findings, Tennant and Hsee suggest, are not limited to screen sizes but are applicable to other domains as well. For example, someone moving from a tiny studio to a medium-sized apartment and someone moving from a large house to a huge mansion will both be happy initially, but over time, the happiness of the first person will stick and the happiness of the second person will fade. The reason is that an upgrade from a studio satisfies one’s inherent or basic needs for living, but an upgrade from a large house only satisfies a learned desire for bigger houses.


Upgrades have their limits

The researchers find that people liked switching from a smaller e-reader to a larger one, but that happiness faded.

How study participants rated their e-reader experience

Happiness scale: 0–22.5

Timing of e-reader ratings:

After 1:30

After 0:15

After 5:45

Size upgrades

One group went from medium to large e-readers

Other group went from small to medium

Tennant and Hsee, 2017
some fewer, and some the chance to state which option they’d prefer. For example, in one experiment, they had
people imagine having $10,000 to invest in a certificate
of deposit and asked them to find the best CD available to
them, any of which would pay between 3.01 percent and 4
percent. One group paid $7 for one set of three randomly
generated options. A second group did the same, but was
also given the option of spending another $7 for three more
options, and so on, in a bid to find the best interest rate.
A third group heard about both options, and then said
which they’d prefer and predicted which would generate
the best return.

The group told of both options preferred the freedom to
have more choices, which they predicted would generate
a better return. But in fact, people with more choices
oversearched and ultimately earned less than people
whose choices were restricted. There was a clear cost
for more choice, $7, but people undervalued it. And the
researchers find the same pattern in other experiments.

The amount of time people spend making purchasing
decisions may lead to “faulty decisions and undesirable
outcomes,” Botti and Hsee conclude. More choices led to
worse outcomes, and by extension, to lower happiness.
When it comes to choice—as industrial designer Peter
Behrens said, and his protégé architect Ludwig Mies van
der Rohe often repeated—less is more.

Lessons for policy makers
The findings from hedonomics will have increasing
importance as countries around the globe get richer. In many
developing countries, the middle class is growing, which
means millions more people will find themselves choosing
different types of televisions and countertops—and
wines, purses, and jewelry—and looking for happiness in this
newly acquired stuff.

In the US and other developed countries, where the
middle class is shrinking, the lessons of hedonomics could be
helpful for policy makers planning for
demographic and workforce changes, Hsee says. The
baby boom generation is aging out of the workforce, and
up to half of today’s jobs may be automated in coming
decades, according to a 2016 White House study. This
transformation could leave a lot of people searching for
work that might not exist, making potentially millions of
people idle. Some economists, as well as business leaders,
have expressed support for the idea of giving people a
universal basic income—guaranteeing income of a certain
amount to people who may find themselves unemployed
and unemployable.

In a strict sense, this may not seem like a problem that can
be addressed by hedonomics, which is about extracting the
most happiness from a set amount of resources. A universal
basic income could make people happier by making sure they
can meet their basic needs.

In the US and other developed countries, where the middle class is shrinking, the lessons of hedonomics could be helpful for policy makers planning for demographic and workforce changes.

But Hsee sees large numbers of idle people as a problem with political and social consequences—and essentially another problem that involves getting more happiness from one set of blocks. “You can make idle people happy by giving them a reason to ‘play with the existing blocks’ without accumulating more blocks,” he says, proposing the government consider programs that give people tasks to do, not unlike the Works Progress Administration of the New Deal era, which put people who were unemployed after the Great Depression back to work. Governments, he says, may need to find ways to engage people with activities.

Whatever the policy implications may be, and whatever form they could take, the research confirms the homespun wisdom that more money doesn’t necessarily buy more happiness. Instead, Hsee says, cherish what you have and make the best use of it. - Chris
WHY HASN'T AI INCREASED PRODUCTIVITY?

GOOD QUESTION! IT’S 2018, RIGHT? HUMANS HAVE SELF-DRIVING CARS, AND MACHINE LEARNING IS SURPASSING HUMAN ABILITY IN MANY AREAS, YET PRODUCTIVITY GROWTH IS LAGGING, AND REAL INCOME HAS STAGNATED SINCE 1990!

YES...HMM...WE, ER, ROBOTS SHOULD HAVE TAKEN OVER BY NOW.

YOUR PATHETIC EARTHLING TECHNOLOGY MIGHT JUST NOT BE WHAT YOU HOPED IT WOULD BE! AI TURNED OUT TO BE USEFUL FOR NOT MUCH MORE THAN SELLING PHONE GAMES AND ACCESSORIES.

CHICAGO BOOTH'S CHAD SYVSEN, HUMAN

DRAKEL ALPHA, ALIEN ARTIFICIAL INTELLIGENCE

TJ-4412, TIME-TRAVELING ROBOT-ASSASSIN
I find that unlikely—even conservative estimates of the potential for AI are astronomical. Replacing all human call centers with perfect automated systems would boost annual productivity growth by 0.25%. Do the same in nine or ten other overlooked industries, and it would result in trillions of dollars of growth. And these estimates aren’t even factoring in industries complementing and growing off each other.

AIs potential is there; the lag in productivity remains a paradox!

The lag in productivity can only be attributed to…

…human error.

The humans must be mismeasuring the effects AI has on their economy!

In the past, we might have needed cameras and film and paper and letters to have such a fun date.

If I were dating (something impossible in my metal husk), I might take a bunch of pictures with my phone to send to my friends.

Productivity data don’t reflect the AI revolution because apps are so cheap!
If that were true, you would think that countries that don’t use Wi-Fi, mobile phones, and computers would not experience the same lag in productivity, since they haven’t replaced industries with cheaper technology.

But countries that use less technology are underperforming at the same rate as countries that use new technologies.

I know what’s happening! Those fat-cat tech giants in Silicon Valley are taking all the profit!

We need a revolution!

Although it’s true that some tech companies make large profits and spend resources lobbying to keep competitors out, their profits and rent-seeking behavior don’t explain all of the productivity lag. The lack of growth we’ve seen since 2004 adds up to $3 trillion per year! No company’s profits come close to that.
The best explanation is that there is a gap between the invention of a technology and its effective implementation.

Consider Amazon: the innovations that allowed for profitable online shopping were not websites and algorithms...

But warehouse and shipping management!

There were similar gaps when electric motors and computers were invented. It took 20 years to get motorized machinery in factories and computers into homes.

We are currently waiting for culture, infrastructure, and organizational structures to catch up with technology. Then we'll start to see productivity growth!

Who's "we"? What kind of robot are you again?

Er, excuse me, I have to go get my oil changed!
Capitalism is the engine of prosperity. Capitalism sows the seeds of its own demise. Could both be right?

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Behavioral economics from nuts to ‘nudges’
A bowl of cashews led to a research breakthrough

In the beginning there were stories. People think in stories, or at least I do. My research in the field now known as behavioral economics started from real-life stories I observed while I was a graduate student at the University of Rochester. Economists often sneer at anecdotal data, and I had less than that—a collection of anecdotes without a hint of data. Yet each story captured something about human behavior that seemed inconsistent with the economic theory I was struggling to master in graduate school. Here are a few examples:

At a dinner party for fellow economics graduate students, I put out a large bowl of cashew nuts to accompany drinks while waiting for dinner to finish cooking. In a short period of time, we devoured half the bowl of nuts. Seeing that our appetites (and waistlines) were in danger, I removed the bowl and left it in the kitchen pantry. When I returned, everyone thanked me. But, as economists are prone to do, we soon launched into analysis. A basic axiom of economic theory is that more choices are always preferred to fewer—because you can always turn down the extra option. So, we asked ourselves, how is it that we’re all happy now that the nuts are gone?

The then chair of the University of Rochester Economics Department and future dean of Chicago Booth (and one of my advisors), Richard Rosett, was a wine lover who had begun buying and collecting wine in the 1950s. He had purchased some choice bottles for as little as $5 that he could...
now sell to a local retailer for $100. Rosett had a rule against paying more than $30 for a bottle of wine, and he did not sell any of his old bottles. Instead, he would drink them on special occasions. In summary, he would enjoy his old bottles worth $100 each, but he would neither buy nor sell at that price. Therefore, his utility of one of those old bottles was both higher and lower than $100. Impossible.

My friend Jeffrey and I were given two tickets to a professional basketball game in Buffalo, New York, normally a 75-minute drive from Rochester. On the day of the game, there was a snowstorm, and we sensibly decided to cancel our plans. But Jeffrey, who is not an economist, remarked, “If we had paid full price for those tickets, we would have gone!” As an observation about human behavior, he was right; but according to economic theory, sunk costs do not matter. Why is going to the game more attractive if we have higher sunk costs?

I had a long list of these stories and would bore my friends with new ones as I acquired them. But I had no idea what to do with these stories. A collection of anecdotes was not enough to produce a publishable paper, much less a research paradigm. And, certainly, no one could have expected these stories to someday lead to a Nobel Prize.

The origin of nudging
My original interests in economics, including my PhD thesis on how to calculate the value of saving lives in cost-benefit analyses, were based on public-policy questions; but when I began studying the combination of psychology and economics, I deliberately stayed away from policy issues. I did so because I wanted behavioral economics to be perceived as primarily a scientific rather than political enterprise. Some of the original resistance to the research came from economists who feared that our findings would be used to support intrusive government interventions.

The research on self-control was particularly fraught with this danger. Many of the laissez-faire economic policies advocated by economists such as the late Milton Friedman were based on the notion of consumer sovereignty—that is, no outsider can know an individual’s preferences better than the person himself. Furthermore, the concept of revealed preference proposed by the late Paul Samuelson of MIT stated that preferences are essentially defined by what we choose. If Alan chooses ice cream over salad, it follows that he prefers ice cream to salad. It is the same line of thinking that led Chicago Booth’s Kevin M. Murphy and the late Gary S. Becker, a Nobel laureate, to argue that because addicts choose to be addicts, they must prefer to be addicts.

How, then, can we make sense of my moving that bowl of cashews out of reach? Did my friends prefer to eat them or not? And if people sometimes do things that they later regret (having one too many drinks the night before, buying something on sale, etc.), what are their true preferences? Most provocatively, is it possible to help people make better choices, even if they are already fully informed (say about the relative merits of salad versus ice cream)? I first decided to dip my toe into these waters by asking if it was possible to help people save for retirement.

Save more tomorrow
If people have self-control problems, they may have trouble saving for retirement. Consider the planner-doer model, which I developed with my first behavioral-economics collaborator, Santa Clara University’s Hersh M. Shefrin, as a theory of self-control that models individuals with two components: a long-sighted “Planner” and a myopic “Doer.” In the language of this model, the planner may wish to save a higher proportion of current income but has trouble controlling the impulsive purchase decisions of a succession of doers, who are tempted by myriad opportunities to buy immediate gratification. Are there ways to give our planners a little help?

In a short paper on this subject, I made a few suggestions, one of which was to increase withholding taxes. This would have the effect of increasing the size of tax refunds (which are already substantial in the United States), and the evidence suggests that people find it easier to save when they receive a large windfall. Another suggestion was to change the default on defined-contribution savings plans. At that time, participants had to actively opt in to join such plans. I suggested changing the default so that if people did nothing, they would be automatically enrolled. This suggestion went unnoticed, but fortunately a Booth colleague of mine at the time, Brigitte C. Madrian, published a paper a few years later demonstrating that this policy dramatically increased enrollments in a company that tried the idea. With the help of that evidence, the idea has now spread widely.

Madrian, now at Harvard, and Dennis F. Shea from the UnitedHealth Group also highlighted a potential pitfall to automatic enrollment. Some people passively accepted a default savings rate picked by a company (perhaps taking it as a suggestion), and if that rate was too low, ended up saving less than they would have if left to their own devices. This compounded an existing problem that savings rates in 401(k) plans were generally too low to support an adequate retirement nest egg, especially for baby boomers who were late getting started. A few years later, I was asked by a large mutual-fund company to speak to the clients of their retirement-plan record-keeping business about ways to increase savings rates.

After some discussions with a former student, Shlomo Benartzi, now at UCLA, I suggested a plan we later named “Save More Tomorrow.” The idea was to think about the behavioral biases that were contributing to low savings rates and a reluctance to increase them, and then use those insights to design a plan to help. We based our plan on three observations. First, people have more self-control regarding future plans than immediate behavior. (We plan to start diets next month, not tonight at dinner.) Second, people are less averse in nominal dollars, and thus resist any reduction in their take-home pay that would happen if they immediately increased their retirement savings rate. Third, retirement savers display strong inertia. They can go for periods of many years without making any changes to their plan. Understanding these causes of low savings rates, we asked how we could overcome them.
The plan we devised had components to address each of the three issues. First, workers were asked whether they would be interested in joining a program that increased their savings rate “in a month or two, not today.” Second, to mitigate loss aversion, the increases in the savings rate would be timed to coincide with pay increases, so workers would never see their pay go down. Third, once the workers joined, the program would remain in place until they actively opted out or their savings rate reached some target or maximum.

This idea also went nowhere until a small company in Chicago decided to try it. They had a problem of low participation and low savings rates among their mostly low-paid workers, and hired a financial adviser to personally meet with each employee and offer advice. Since savings rates were typically quite low, the adviser, Brian Tarbox, usually suggested that they increase their annual contributions by 5 percentage points. Most workers turned this advice down on the grounds that they could not afford it. To these reluctant savers, Tarbox offered a version of Save More Tomorrow in which savings rates would increase 3 percentage points at each pay raise. About 80 percent of those offered this plan signed up, and after four pay raises, their savings rate had gone from 3.5 percent to 13.6 percent. (Those who accepted the advice to increase their savings rate by 5 percentage points plateaued at that new level.)

Benartzi and I presented a paper based on these and other findings at a conference held at the University of Chicago honoring my thesis advisor Sherwin Rosen, who had recently died quite prematurely. The University of Chicago economist Casey Mulligan, who maintains orthodox Chicago School views, was the discussant. Mulligan agreed that the results were impressive but asked a question I had not anticipated. “Isn’t this paternalism?” I stammered a bit and noted that the program was completely voluntary and thus absent any of the coercion normally associated with paternalistic policies such as Prohibition. “If this is paternalism,” I said, “it must be a different sort of paternalism. I don’t know, maybe we should call it libertarian paternalism.”

Libertarian paternalism is not an oxymoron

I mentioned this interaction to my friend and colleague at the University of Chicago Law School, Cass R. Sunstein, telling him that I thought the idea of libertarian paternalism seemed intriguing. We wrote two papers on the topic, one that I drafted that was five pages and one that Cass took the lead on that was 52 pages, by far my longest paper. In fact, it was so long that it looked to me to be nearly the length of a book. At one of our lunch meetings, I may have used the word “book” carelessly in conversation, which can be dangerous when talking to Cass, who seems to be able to write books faster than I can read them. One thing led to another and, with me cruelly slowing Cass down to what he considered a snail’s pace, we eventually wrote the book.

When we were looking for a publisher for the book, we found the reaction to be rather tepid, probably in part because the phrase “libertarian paternalism” does not exactly roll off the tongue. Fortunately, one of the many publishers who declined to bid on the book suggested that the word “nudge” might be an appropriate title. And so, we published Nudge: Improving Decisions about Health, Wealth, and Happiness. In this roundabout way, a new technical term came into social-science parlance: a “nudge.”

Nudge is based on two core principles: libertarian paternalism and choice architecture. It is true that the phrase “libertarian paternalism” sounds like an oxymoron; but according to our definition, it is not. By “paternalism” we mean choosing actions that are intended to make the affected parties better off as defined by themselves. More specifically, the idea is to help people make the choice they would select if they were fully informed and in what Carnegie Mellon’s George Loewenstein calls a cold state, meaning unaffected by arousal or temptation. (For instance, we ask you today how many cashews you would like to eat during cocktails tomorrow.) Of course, deciding what choices satisfy this definition can be difficult, but the concept should be clear in principle. The word “libertarian” is used as an adjective to modify the word “paternalism,” and it simply means that no one is ever forced to do anything.

Choice architecture is the environment in which people make decisions. Anyone who constructs that environment is a choice architect. Menus are the choice architecture of restaurants, and the user interface is the choice architecture of smart phones. Features of the choice architecture that influence the decisions people make without changing either objective payoffs or incentives are called nudges. The example of the default option in pension plans is a now-classic example of a nudge: joining is made easier, but no one is forced to do anything. To rational economic agents (whom we call Econs), it should not matter whether one of the boxes in a yes-no choice is already clicked in an online form. The cost of clicking the other box is trivial. But in a world of Humans (as opposed to Econs), nudges matter, and good choice architecture, like good design, makes the world easier to navigate. Indeed, GPS maps are a perfect illustration of libertarian paternalism in action. Users choose a destination, the map suggests a route that the user is free to reject or modify, and for those of us who are directionally challenged, we get to our desired destination with fewer unintended detours. Importantly, no choices are precluded. Both automatic enrollment (with an easy way to opt out) and Save More Tomorrow are nudges.

Much to our delight and surprise, nudging has become a global success. Over 200 governmental units (including the City of Chicago) have created behavioral-insight teams that explore policies informed by behavioral science and subject to rigorous tests, using randomized controlled trials wherever possible.

Richard H. Thaler is Charles R. Walgreen Distinguished Service Professor of Behavioral Science and Economics at Chicago Booth and was the recipient of the 2017 Nobel Memorial Prize in Economic Sciences. This is an edited excerpt of his Nobel Prize Lecture, given December 8, 2017, in Stockholm, and is printed with permission from the Nobel Foundation. © The Nobel Foundation 2017

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Globalization has changed. The globalization we knew and understood for most of the 20th century resembled more the globalization that emerged from the Industrial Revolution than it did the globalization we experience today. That globalization was based on the movement of goods across borders—measurable, limited by physical infrastructure, and parried by policies such as tariffs. But globalization today is about more than trading goods; it’s about trading ideas and, increasingly, services. Our 20th-century paradigms of globalization are ill-equipped to understand what cross-border trade means for the present and near future. Globalization has changed, but the way we think about it hasn’t.

The one thing that hasn’t changed about globalization is that it is a phenomenon with the power to change the world. If you trace the share of world income going to two groups of countries—India and China in one group and the G7 countries in the other group—back to the year 1000, you’ll see that back then, India and China had about half of the world’s GDP, and the G7 had less than 10 percent of it. That makes sense: back then, basically everybody was poor and agrarian. India and China had half the world’s people, pretty much as they do now, and the G7 had only about 11 percent.

Keep tracing for eight centuries, up to 1820, and not much changes. The G7 share goes up a little bit because Canada and the United States appeared and were populated, but the change is modest. I like to call that period the Great Stagnation, and of course it was stagnated because there was no modern growth.

Starting around the 1820s—the decade economists Kevin H. O’Rourke of Oxford and Jeffrey G. Williamson of Harvard have pegged as the start of modern globalization—the G7 share starts to swell. Over the course of about 170 years, it goes from about one-fifth up to about two-thirds of world income. That’s how powerful globalization—the movement of goods across borders—was.

The conventional understanding of globalization really dates back to around the time of this momentous swing in the fortunes of the G7. The British classical economist David Ricardo described the theory of comparative advantage in 1817. His theory, and the paradigms of globalization that have succeeded it, did a nice job of explaining why the G7’s share of global income kept going up. But as I point out in my 2016 book, *The Great Convergence*, something changed.

Starting around 1990, the G7’s share of world GDP fell to under 50 percent in two decades, back to the level it was at in the 1900s. And the ideas we used to understand globalization while the G7’s income share was growing don’t work as well to explain it while that share is shrinking. Something fundamental changed around 1990, and that’s what I call the new globalization. It requires a whole new way of thinking about globalization, one attuned to the 21st century rather than the 20th or 19th.

**The new globalization**

Globalization is arbitrage. What is arbitrage? It’s taking advantage of a variation in price between two markets. When the relative prices of some goods are cheap in Mexico, that’s what they sell to us, and when other goods are relatively cheap in the US, that’s what we sell to them. A two-way, buy-low/sell-high deal—that’s arbitrage, and trade theory is all about...
what the direction of arbitrage, and especially arbitrage in goods, is.

But goods aren’t the only thing that can move across borders; there can also be an arbitrage in know-how, and there can be arbitrage in labor. The new globalization has to do with knowledge crossing borders. Future globalization will have to do with labor crossing borders—not people, but labor services.

Globalization as arbitrage is constrained by three costs: trade costs, or the cost of moving goods; communication costs, or the cost of moving ideas; and face-to-face costs, or the cost of moving people. In the preglobalized world, production and consumption were geographically bundled. In particular, people were tied to the land since the land was what provided most people’s living, and if they needed anything—candles, horseshoes, clothes, whatever—it had to be made within walking distance because it was too expensive and dangerous to move anything anywhere.

But with the advent of steam power, the cost of moving goods fell. Production and consumption could be spatially unbundled. It’s what I call the first unbundling, and when things are made in one place and consumed in another, we have trade. So that’s the classic old globalization: things started to be made in one place and consumed in another.

When everybody is tied to the land and production is tied to who or what is within walking distance, the whole world’s economic geography is very even. It’s dispersed, and that dispersion makes it hard to innovate. On the demand side of innovation, what use is it coming up with new, clever techniques when you’re only producing for two dozen families? And how easy is it to develop new techniques when you’re the only blacksmith in walking distance?

Once you could sell to the world market, it became profitable to adopt scale-intensive techniques, and those techniques were very complicated. To coordinate the complication and save on communication costs, all the stages of production were put within walking distance of each other. It became worthwhile to innovate, and for that reason, modern growth took off just about exactly the same time modern globalization took off.

But the growth stayed local. The innovations did not spread around the world because it was hard to move ideas, especially complex ideas such as manufacturing, and that’s how we got what historians call the Great Divergence, the disparity between developed economies and undeveloped ones.

On a visit to Nagoya, Japan, in 1987, I was invited to tour the Toyota factory there. It was huge—something like 24 football fields inside a single building. You needed a go-kart to get around the place, and all around it outside was what they called Nagoya city—all the suppliers who made the different components for the cars, and all basically within walking distance. Everyone whose work went into the cars had to be physically near the factory because communication costs made it so difficult to coordinate production.

Eventually, though, information and communication technology (ICT) lowered the cost of moving ideas. The ICT revolution made offshoring organizationally feasible, and vast wage differences between countries made it profitable.

ICT allowed people to disaggregate spatially—a second unbundling, this time an unbundling of the stages of production. Now everyone who worked on any part of a Toyota didn’t have to be within walking distance of the plant in Nagoya. Now the stages of production could move to different countries, in particular low-wage countries. This has many names: offshoring, outsourcing, fragmentation, vertical specialization. It’s a widely discussed and studied phenomenon, but I think we tend to discuss and study the wrong things about it. We focus on the flows of jobs because that’s what we can measure, but that’s not what has changed the world.

What changed the world was the offshoring of know-how along with the jobs. Before the ICT revolution, knowledge stayed local. But once firm-specific know-how from manufacturing firms in G7...
International competition can reach inside the factory for an individual stage of production and offshore it. It’s not at all clear that what’s offshored lines up with high skill versus low skill.

countries was taken to nearby emerging markets and combined with low-wage labor, the nature of competition in manufacturing was never the same.

At one time, if you were building, for instance, a truck, you had to choose between doing it with high-end technology in a high-wage environment such as Germany, or with low-end technology in a low-wage environment such as China. Now, American or German or Japanese companies can take their technology to China and combine high tech with low wages. That’s because knowledge is what economists call a nonrival factor, which means you don’t have to choose between either using it in Germany or using it in China. You can use it in Germany and China.

To really understand how this changed the nature of globalization, consider a sports analogy. Suppose we have two football teams, one that needs a quarterback but has too many linebackers, and one that needs a linebacker but has too many quarterbacks. If they sit down and trade players, both teams win. It’s arbitrage in players. Each team gets rid of players they need less of and gets players they need more of. That’s the old globalization: exchange of goods.

Now let’s take a different kind of exchange, where the coach of the better team goes to the field of the worse team and starts training those players in the off-season. This is very good for the coach because he gets to sell his knowledge in two places. You can be sure that the quality of the league will rise, all the games will get more competitive, and the team that’s being trained up will enjoy the whole thing. But it’s not at all certain that the players of the better team will benefit from this exchange because the source of their advantage is now being traded.

In this analogy, the better team is, of course, the G7, and not surprisingly this has led to some resentment of globalization in those countries. The new globalization breaks the monopoly that G7 labor had on G7 know-how, and apart from the fact that it undermines the comparative advantage in manufacturing that the US and other G7 countries had, it simply seems unfair. When your company, say GM, shuts down a stage of production and moves it to Mexico using the technology that justified your $24 per hour salary and starts paying somebody $24 per week, that just seems unfair.

But another, less obvious source of resentment is that the new globalization affects economies with a finer degree of resolution. International competition can reach inside the factory for an individual stage of production and offshore it. It’s not at all clear that what’s offshored lines up with high skill versus low skill. And yet labor unions and government policies are still organized by sector or skill group or both.

New globalization’s impact is more sudden than old globalization’s because it’s driven by ICT, not by tariff cuts or the
construction of new ports and container ships. It’s more individual because it’s no longer felt across entire sectors and skill groups, but in individual stages of production. It’s more unpredictable. It’s hard to know which of these stages will disappear and why. And it’s more uncontrollable because governments have very good policies for controlling people and goods crossing borders, but they don’t have good policies for controlling firm-specific know-how crossing borders.

So there has been a generalized feeling in goods-producing sectors that no matter what job or skill set you have, you can’t really be sure whether your job won’t be next. There has been a sense of fragility, of vulnerability—an economic insecurity that’s been generalized, and this has been going on for two decades.

The future of globalization

To date, the gains and pains of globalization and automation have been felt mostly by the manufacturing sector. In the future, the gains and pains will be felt by professional and service-sector jobs. That’s because digital technology is going to lower the third constraint to globalization as arbitrage: the cost of moving people around, or facilitating face-to-face interaction.

Service jobs have been shielded from globalization because they require people to be face-to-face, or at least near each other. For most services, you can’t put them into a container and ship them from China to New York. So global competition was deflected by the shield of high face-to-face costs.

Digital technology, however, is opening a pipeline for direct international wage competition. In other words, labor from countries such as Kenya, Nigeria, or the Philippines can come and work in G7 offices directly through telecommunications. There are a number of ideas and technologies that are making this increasingly feasible:

Telemigration. Many people work from home on a regular or semiregular basis. Does it matter if they’re working from home in Chicago or if they’re working from home in Beijing? As remote work becomes more technologically and culturally mainstream, perhaps we won’t be offshoring entire jobs, but rather the stages of production of white-collar jobs—specific tasks that can be done remotely for cheaper than they’re done locally.

Virtual globalization websites. With the growth of the gig economy, there’s been a corresponding growth in online hubs where people can say, “I’m a freelancer. I can make logos. I can design web sites. I can copyedit articles.” But the gig economy can also apply to what have been traditionally thought of as office jobs, so you might also see “I can do your accounting. I can process your expense forms.” Upwork, Freelancer, Amazon Mechanical Turk, and Fiverr are all in this business, and LinkedIn is getting into it as well.

In China, freelancing is a huge part of the employment picture because China overproduces university graduates—Chinese universities graduate 8 million people a year, but most of the jobs available locally are in manufacturing. So along with all the sites listed above, there’s also Zhubajie, a Chinese service that was recently branded Witmart for English speakers, and it’s offering its services internationally.

Machine translation. Many of us have become, or at least have the ability to be, multilingual, thanks to the computing power of our phones. An English speaker can sit down in a restaurant in France, Germany, China, Spain, and many other countries and order dinner using Siri as a translator. For more conversational applications, Skype Translator can provide real-time voice translation in eight languages.

Machine translation is going to transform global competition in services, creating a talent tsunami. Let’s suppose 1 percent of the world’s population is part of the talent pool for a particular occupation. That would mean there’s something like 144 million people who are truly fit for work in that field, but maybe only 40 million of them speak English—for now. This year or next year, the other 100 million will speak passable English, and the year after that they’ll speak perfect English, because these translation services continue to improve. The supply of people willing and able to offer their services in every major language will explode.

This technology will be felt beyond telemigration too. Linguistic differences are estimated to hinder trade by something like 150 percent. When language barriers go down, barriers to trade do as well.

Advanced telecommunication technologies. A final technology that’s helping to close the distance between collaborators in different countries is “telepresence”—immersive videoconferencing environments that use high-resolution, life-size screens, dozens of speakers and microphones, and often tables that look the same on both sides, so a group in New York and a group in Mumbai, India, could have the feeling that they’re almost in the same room. There are even telepresence robots, which make it possible for someone operating remotely to actually move around an office or other workspace and have a physical presence there. So far this hardware is pretty expensive, and therefore only used at the high end of industries such as consulting and banking—or, in the case of robots, medicine—but all it has to do is get cheaper, and it will change things.

Reaching epiphany

Humans have brains that are built to think about things linearly—to understand motion in nature, to look at two points and calculate how long it would take to walk from one to the other. But technological growth is exponential. That mismatch gives rise to the cognitive pattern known as Amara’s law, which states that we have a tendency to first overestimate and then underestimate the significance of new technologies. For instance, we landed on the moon, and people assumed the next step would be colonizing Mars. We’ve still never set foot on Mars, but in the meantime, we’ve put countless technologies into space that have changed the experience of life on earth.

There’s a point at which the exponential path of technological growth crosses the straight line of human expectation, and it’s the point at which the real power of this technology that we’ve alternately over- and underestimated fully dawns on us. I call it the “holy cow” moment. We haven’t quite reached it yet with ICT and its meaning for globalization. When we do, it will not be the result of a single, sudden event.

In the old days, globalization came and shut down the big factory in town, and thousands of people were put out of work, and it was a great tragedy, but it was the result of someone’s conscious choice. I don’t think the next phase of globalization will happen that way.

FOOTNOTES

Visit Review.ChicagoBooth.edu to read more on trade and immigration.
Nobody will ever decide to have a job apocalypse in which we replace all the service-sector workers or all the doctors or all the lawyers. But it’s already happening in media. It’s happening in law. It’s happening at the low end of medicine. And I think we’re getting close to the holy-cow moment.

Richard Baldwin is professor of international economics at the Graduate Institute of International and Development Studies, Geneva, as well as director of the Centre for Economic Policy Research and founder and editor-in-chief of VoxEU.org. This essay is adapted from a lecture hosted by Chicago Booth’s Initiative on Global Markets in March as part of its Myron Scholes Global Markets Forum.

Go to Review.ChicagoBooth.edu to see a complete list of citations for research mentioned in this essay.
If you’re temporarily paid to do something, would that change your motivation or interest in doing the same thing when you’re not paid to do it anymore? University of Buffalo’s Indranil Goswami, a graduate of Chicago Booth’s PhD Program, and I investigated this long-standing question, which I’ll get to soon. But first, some background.

Psychologists and economists have long debated the effectiveness of incentives. From the viewpoint of economics, it’s almost definitional. Much of the empirical research in the field is about how incentives—overt, hidden, and even perverse—influence and explain people’s actions. While this view can be summarized simply as “incentives work!” identifying what the incentives are can be tricky, and the definition of what constitutes an incentive has been broadening. University of California at San Diego’s James Andreoni, for example, in 1989 defined the “warm glow” feeling that a person may get from donating to others as an incentive that can explain altruistic behavior.

Psychologists tend to think in terms of internal mental processes and motivators, and have historically been skeptical of external incentives, particularly monetary ones, which they see as impure. External incentives, they believe, interfere with people’s true, or intrinsic, motivation.

Which brings us to one of my favorite papers, a comprehensive review in 1999 by University of Rochester’s Edward L. Deci and Richard M. Ryan and McGill University’s Richard Koestner of how incentives affect intrinsic motivation. They looked for experiments that tested how motivated people were to do a task without compensation after having been temporarily paid to do the task. In the paper, Deci, Koestner, and Ryan painstakingly gathered up the research, including unpublished studies (in order to deal with publication bias); categorized the differences in experimental methods; and summarized the average findings.

They examined the free-choice paradigm, in which participants are paid to do an activity such as drawing and then are put in a situation in which they could do more of the activity if they chose, but with no further compensation. Their decision about whether to, say, draw more is compared with the same decision among people who were never paid to draw in the first place.

On the basis of the 101 studies they compiled, it looks bad for incentives. Participants who were paid to do the activity did less of it when the payment was no longer available than participants who had never been paid. From a classical economics perspective, this may appear weird—if you like drawing, you should draw, whether or not you were previously paid to draw. To many psychologists, however, the reason seems clear: paying people changed how they viewed drawing, undercutting the intrinsic motivation that made it fun in the first place.

The experiments varied a lot, and so did the results. Verbal rewards such as praise had positive effects on subsequent motivation, at least for college students. The negative effects were driven by tangible rewards, such as money, in situations where participants were paid.

**Short-term rewards don’t sap long-term motivation**

So stop fretting about temporary incentives.
conditionally—that is, they earned a reward only when they tried the activity, completed it, or achieved a particular performance in it.

What does this mean? Deci, Koestner, and Ryan’s proposed theory centers on feelings of autonomy: people do things in part to feel good about having done it themselves. When someone else comes in and provides a conditional reward, it eliminates the ability of the activity to provide the autonomy benefit. And here’s the key: this is assumed to be a long-term change in how the activity is perceived and experienced. As a result, there’s a risk to using incentives. As the researchers warn, “if people use tangible [i.e., monetary] rewards, it is necessary that they be extremely careful . . . about the intrinsic motivation and task persistence of the people they are rewarding.”

The evils of incentives
The view that a temporary incentive could undermine intrinsic motivation has had a major impact on policy, particularly in relation to children and education. The author and lecturer Alfie Kohn has published several books on the topic, including one called Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, As, Praise, and Other Bribes. Appearing on the Oprah Winfrey Show in 1996, he explained why he saw rewarding kids as a bad idea: “One of the findings in psychology that has been shown over and over again [is that] the more you reward people for doing something, the more they tend to lose interest in whatever they had to do to get the reward.”

He went on to talk about grades as problematic incentives, and he went further in his book, writing that verbal praise is coercive and should be avoided because it contains an implied threat to withhold praise in the future.

But in Deci, Koestner, and Ryan’s meta-analysis, verbal rewards had no negative effect on children’s subsequent motivation, and even tangible rewards had no postreaward effect when the reward was unexpected.

The Oprah Winfrey Show followed up with an experiment of its own that yielded a somewhat implausibly strong effect. A representative from the show paid some students to do puzzles. When the representative left the room, the students who had been paid lost interest in the puzzles, while the students who hadn’t been paid did not. Kohn characterized this result first in terms of an inference-based theory of intrinsic motivation before circling back to the control-versus-autonomy account.

“If the kid figures ‘they have to bribe me to do this,’ then ‘it must be something I wouldn’t want to do,’ so the very act of offering a reward for a behavior signals to somebody that this is not something interesting,” Kohn said.

He was talking about the overjustification hypothesis set forth by Stanford’s Mark R. Lepper, David Greene, and University of Michigan’s Richard E. Nisbett in 1973. However, most of the experiments in which this has been tested involved young children, particularly preschoolers. There’s something a bit odd to me about the idea that the teenagers on the show were unable to judge how interesting the task was on their own, without making those kinds of more-remote inferences.

“We’re left with the admonition that in the long run, rewards will backfire and harm motivation, for both teachers and parents. As Oprah said, “You have to change the way you think about parenting!’” But notice how far the broad advice being given to parents and teachers is from the nuanced differences between incentive strategies described in the 101 studies reviewed.

Paying kids to read books yielded a significant improvement in reading comprehension, but what happened when the program ended?

Where’s the long-term harm?
Perhaps the most comprehensive experiments to test these ideas in a real-world setting were done by Harvard University’s Roland G. Fryer Jr.

Overall, his results suggest little effect, positive or negative, of paying schoolchildren for their performance, such as for getting high test scores. However, he also conducted two large-scale randomized in-school trials that tested rewards for students’ efforts, for the underlying behaviors that could foster success in school. In Dallas, second-graders randomly assigned to the treatment condition were paid $2 for each book they read and passed a quiz on. In Washington, DC, some sixth-through-eighth-graders were paid for other educational inputs, including maintaining their attendance record, exhibiting good school behavior, and handing in homework.

Paying kids to read books yielded a significant improvement in the Dallas students’ reading comprehension, a marginal improvement in their language scores, and a positive but insignificant improvement in vocabulary scores. In Washington, DC, the incentives yielded a marginal improvement in reading and a nonsignificant improvement in math.

What happened when the incentive program ended? The psychological theories we’ve been discussing would predict that the kids will be worse off. Instead, Fryer finds that the positive effects were reduced by half and were no longer statistically significant.

The benefits did seem to fade when the incentive ended, but there is no evidence that the outcomes were worse than they would have been if the incentive had not been offered. Three other studies with older students at the high-school and college level actually find some positive effects of education incentives that significantly persisted after the incentive ended.

This brings us to Goswami and his research. Goswami, who wrote this up for his PhD dissertation, reviewed 18 field studies across a variety of domains, including completing an education, stopping smoking, losing weight, going to the gym, sticking to a medical routine, and working productively. All 18 of the studies measured people’s total behavior in a period after the incentive had ended, and they find either no long-term effect or a modest positive effect. Not a single study suggests that study participants, compared with those who didn’t receive any incentive, had worse outcomes when an incentive was offered and then ended. Where was the long-term harm?
The effects wear off
Motivational theories and research suggest that incentives reduce intrinsic motivation, and lower task engagement. But tests of incentives in real-world settings all find either no long-term effects or positive long-term effects.
Goswami tackled this puzzle. Prior studies generally only measured people’s behavior right after the incentive ended, so he designed a test to see how motivation to engage in a task compared before, during, and after an incentive—and how it changed over time.
In his studies, people were repeatedly given the choice to either do a 30-second math problem or watch a 30-second video. There were three rounds:
Round 1: Participants chose eight times between math problems and videos.
Round 2: Participants chose 10 times between math problems and videos. However, while half the participants were offered no incentive, the other half were offered 5 cents for every correctly solved problem. These participants were told that the incentive would apply only in that round.
Round 3: In this key test, participants, offered no incentives, chose 12 times between math problems and videos.
Participants given an incentive in Round 2 would probably do more of the math problems while the incentive was available than people not paid to do math. But what would happen in Round 3, when the incentive was no longer available?
According to the psychological theories, participants who were never paid would have their intrinsic motivation intact, and would keep doing the math to the degree they found it interesting. But for participants paid to do math during Round 2, the math task would be different: either it would no longer provide autonomy or they would have inferred that it was an uninteresting task—and wouldn’t want to do it anymore. So the results would be predicted to look like the chart on the right. (See “When rewards come to an end.”)
If asked, Kohn would presumably endorse the no-payment condition—sure, the payment gives us a short-term increase in the math task during Round 2, but at what cost to long-term motivation?
Economists would tend to disagree. Incentives should increase the number of math problems participants do when they’re being paid, but why would it have a negative effect afterward? Once the incentive ends, participants should go back to doing as many math problems as they enjoy, as if the incentive had never happened. Or, if the incentive actually helped them improve at the task by getting them to practice more in

When rewards come to an end
In a study of people’s intrinsic motivation, the researchers find that creating incentives to get people to choose less-desirable tasks could work pretty well.

Percentage of participants who chose to do a math problem instead of watching a video

<table>
<thead>
<tr>
<th>Group offered a reward to choose math</th>
<th>Control group offered no reward</th>
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<tr>
<td>A spike when rewards are offered</td>
<td>A drop when rewards end</td>
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<tr>
<td>100%</td>
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<td>Baseline period</td>
<td>Reward period</td>
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<td>Postreward period</td>
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The prediction from prior research . . . The predicted spike holds true

Although rewards had ended, people’s willingness to do math returned after the initial drop

Goswami and Urminsky, 2017

The results are inconsistent with the dire warnings about incentives.

Round 2, maybe they would continue to do a bit more than they had been doing before.
Goswami conducted a series of experiments, varying multiple factors, and with nearly 1,100 participants.
He finds that in the first round, the two groups chose the math task at the same rate. In the second round, participants who could earn money for solving the math problems did a lot more math problems. That makes sense.
But in Trial 19, when the incentive ended, participants who had been paid to do math were suddenly a lot less likely to choose the math tasks. They wanted to watch a video, not only more than they had before, but also more than the participants who had never been paid an incentive in the first place. It looks like intrinsic motivation was reduced—but only for a while. This effect was weaker.
in Trial 20, and the difference was effectively eliminated by Trial 21.

A minute and a half or a mere three choices later, the story had changed. Whether or not a participant had been paid an incentive didn’t affect his willingness to do math rather than watch videos. After a few more choices, the pattern actually fully reversed, and the participants who had been paid before did more math problems, for free.

In a sense, both sets of findings from prior research were vindicated. Immediate negative effects on behavior after the incentives were withdrawn had been found in previous lab experiments and were found here too. On the other hand, as in the field studies, there was no overall negative effect.

The results are inconsistent with the dire warnings about incentives. Providing a temporary incentive can yield a boost in behavior while people are being paid, and only a small and brief decline afterward. Maybe incentives work pretty well after all.

Cash rules everything?
Maybe the theory that paying people would supplant their intrinsic motivation is mostly right, just wrong about the degree and duration. Maybe intrinsic motivation is reduced but bounces back after people have a little time to forget about the payment. Or maybe giving people the opportunity to make a few choices on their own without any external influence resets their intrinsic motivation.

But maybe the theory is wrong about the effects of payments. Perhaps people are trying to manage the eternal trade-off between effort and leisure over time. If they want a mix of both, they invest in more effort when they have a good reason to do so. And when the incentive is gone, it’s an opportunity to balance it back out by taking a break.

Goswami gave people different kinds of breaks after the incentive ended. He finds that giving people a brief break eliminated the initial postincentive decline, but only if the break did not involve difficult choices. Giving people a little leisure made them willing to dive back into the math problems.

How about a more direct test? The intrinsic-motivation theory predicts that the more intrinsically motivating the task, the more pronounced the negative effects of incentives will be. Goswami varied which task was incentivized, paying some participants for every video they watched and others for every math problem they solved. After being paid to do math, participants wanted a break and initially watched more videos. But contrary to the intrinsic-motivation theory, participants paid to watch videos showed no difference in their postpayment choices.

Perhaps the most direct test came from simply varying the amount of the payments. According to the theory, the larger the incentive, the more controlling it is, and the more damage is done to intrinsic motivation. However, paying participants a high amount led to no immediate postincentive decline, and participants did more of the math task without any additional payment—again, the opposite of what the intrinsic-motivation account would predict.

We need more research to figure out when incentives would have no postincentive effects. But at a minimum, our findings strongly suggest that simply offering a temporary incentive does not necessarily harm intrinsic motivation. Instead, it seems that when people work harder because of an incentive than they would have without it, they just want to take a break afterward. -O.U.

Oleg Urminsky is professor of marketing and Beatrice Foods Co. Faculty Scholar at Chicago Booth. This essay is adapted from posts that appeared on his blog, Marginally Significant.

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PROGRAM HIGHLIGHTS
Exclusively for public board members, members of companies that may be taken public shortly, and foreign corporations listed on the US exchanges

Gleacher Center, Chicago
September 25–28
Application deadline: August 10

Optional Finance and Accounting Session: September 24
A debt crisis does not come slowly and predictably, like the tide. It comes unexpectedly, like an earthquake. This year’s short-term bondholders are mostly interested in whether new bondholders will show up next year, to lend the government money that the government can use to pay this year’s bondholders back. Bondholders can run, refusing to invest this year at the usual rates, if they have even small jitters about that question.

When bondholders get nervous, they demand higher interest rates. They may also diversify their portfolios, or just refuse to purchase more bonds. Debt gets hard to sell at any price. A different class of bondholders, willing to take risks in return for better rates, must come in to replace the safety-oriented clientele that currently holds short-term government debt.

As interest rates rise, interest costs on the debt rise. The US national debt is roughly $20 trillion. If interest rates on that debt rise to 5 percent, interest costs rise to $1 trillion, essentially doubling the already huge deficit.

That’s 5 percent of GDP, and a quarter of federal revenues. That deficit would make bond markets even more nervous. They would demand still-higher interest rates. When that spiral continues, you have a full-blown debt crisis on your hands.

Short-term debt compounds the problem. Since the US has issued much of its debt using short-term bonds, interest-rate increases make their way to the budget more quickly. If the US had borrowed everything in 30-year bonds, higher rates would only slowly translate to larger deficits, giving us time to fix the underlying fiscal problem.

Debt crises typically come in bad times: when in a war, recession, or financial crisis, the government suddenly needs to borrow a lot more, and markets doubt its ability to repay.

But crises can happen in good times as well. We have known for decades that the US has promised entitlement spending far beyond what our current tax system can fund. Markets have—sensibly, I think—presumed that the US would fix this problem sooner or later.

“Well,” said markets in 2005, “OK for now—you have a war on terror and a war in Iraq on your hands. We’ll trust you to fix entitlements later.”

“Well,” said markets in 2012, “OK for now—you’re recovering from a massive financial panic and the Great Recession. We’ll trust you to fix entitlements later, and we’ll even lend you another $10 trillion.”

But what’s our excuse now? At 4 percent unemployment, after eight years of uninterrupted growth, if we can’t sit down now and solve the problem, when will we? Yet there is no sign in Congress of either long-term entitlement reform or the massive—5 percent to 10 percent of GDP—tax increases needed to fund current entitlements. Markets have a right to think that perhaps America won’t fix our fiscal mess in time. Or, more accurately, markets have a right to worry that next year’s markets will have this worry, and get out now.
For some historical context on America’s recent fiscal health, take a look at the chart above. The graph is federal surplus (above the 0 line on the graph) or deficit (below it), not counting interest costs, divided by potential GDP. Taking interest costs out allows us to see the underlying tax and spending decisions more clearly.

US fiscal policy actually has been quite sober over the years. In economic good times, we run primary surpluses. The impression that the US is always running deficits is mostly because of interest costs. Even the notorious Reagan deficits were, for the most part, payments on outstanding debt occasioned by the huge spike in interest rates. Only in the extremes of 1976, 1982, and 2002, in which we were mired in steep recessions and, in the latter case, war, did we touch any primary deficits, and then we pretty swiftly returned to surpluses.

Until 2008. The last 10 years really have been an anomaly in US fiscal policy. One may say that the huge recession demanded huge fiscal stimulus, or one may think $10 trillion in debt was wasted. In either case, what we just went through was huge.

And now primary deficits are set to dramatically increase again, via about 1 percentage point of GDP extra tax cut, 4 percentage points of GDP extra spending. And then the social security and health care deficits really kick in.

So perhaps today’s bondholders have good reason to fear that tomorrow will be the day that markets finally lose patience with US fiscal policy. Most commenters, including me, think this day is still far in the future. But the future comes unexpectedly.

Torsten Sløk of Deutsche Bank noted this year in an email to clients and other market watchers that in Treasury auctions, the ratio of dollars being bid to the total value of the bills being offered—the bid-to-cover ratio, an important measure of demand—is lower than it has been since the 2007-10 financial crisis. “The bid-to-cover ratio at four-week T-bill auctions is currently at the lowest level in almost 10 years,” he wrote. “Demand is also structurally weaker when you look at 10-year auctions.”

“Things are so far looking OK,” Sløk continued,

but the risks are rising that the US could have a full-blown [emerging markets]-style fiscal crisis with insufficient demand for US government debt, and such a loss of confidence in US Treasury markets would obviously be very negative for the US dollar and US stocks and US credit. The fact that this is happening with a backdrop of rising inflation is not helpful.

We’re not there yet, and I think we have a long way to go. But the low bid-to-cover spreads could be a tremor. Another could be flagging international interest in owning US debt, as observed by the Wall Street Journal in February, when US 10-year yields were at 2.9 percent and German yields were at 0.68 percent, and Europeans were still shying away from US bonds, in part because of worries about a further slide in the dollar (which comes when next year’s international bondholders really don’t want to hold US debt).

Again, these are little rumbles. I still think that a full-blown crisis will come only amid a large international crisis. Perhaps the debt mess in China explodes, along with a few big country defaults, or state and local pension failures. (A crisis always starts with a mountain of debt and shady accounting.) Perhaps an expensive war increases our borrowing demand while freezing markets. The US then comes to markets with unresolved entitlements and asks for another $10 trillion just as everyone else is selling their Treasury reserves too.

But I could be wrong. We live on an earthquake fault of debt, and the one thing I know from my own past forecasting ability—I lived through 1987, the dot-com boom and bust, 2008, the recent bond boom, and more, and saw none of them coming in real time—is that I will not see it coming either. The one thing I know from studying finance and its history is that most other people won’t see it coming either.-\c88

John H. Cochrane is a senior fellow of the Hoover Institution at Stanford University and distinguished senior fellow at Chicago Booth. This essay is adapted from two posts on his blog, The Grumpy Economist.
The “weekend rentals” were the worst—the sales associates at Sagebrush stores, where I worked in high school, were unanimous on this point. It’s not that our returns policy was frictionless or beloved by every patron. As anyone who’s ever spent quality time in the customer service line at a Macy’s, Kohl’s, or Forever 21 will attest, in the face of even a minor speed bump, people who are otherwise reasonable adults will often shed any semblance of polite restraint and reclaim the rebel yell of wailing toddlers everywhere: “I WANT WHAT I WANT!!!”

They didn’t get what they wanted at Sagebrush, not always, at least. That wouldn’t be fair, not to the store, not to the other customers, and certainly not to the poor sales associates, high-school kids who were getting $4.25 an hour to hawk cheap clothing with cowboy flair to middle-income Michiganders. For nearly two years, I was one of those kids, and while I came to understand that it is an occupational requirement of a retail salesman that, in Daniel Defoe’s memorable phrasing, “if he sees himself ill used, he must wink, and not see it,” I also learned there were exceptions, especially when the company’s bottom line was involved.

This is why merchandise returns were always a dicey matter. Customers are inevitably fickle, and stores have to figure out when they’re also unfair. Say a shopper decides the décolletage on her fire-engine-red crop top is a little outré for the ladies literary club. Did she buy it last Tuesday and are the tags still attached? No problem—she can bring it in for a full refund. But did she wear the same crop top for weeks on end until there were pit stains and a split in the shoulder seam? Yeah, it doesn’t matter if she still has the receipt—she’s not getting her money back.

To the sales associates at Sagebrush, what fairness required in either of these cases seemed pretty straightforward, which is why the weekend rentals so annoyed us. Typically, a suspect would slink into the store on Sunday afternoon, clutching his plastic Sagebrush bag like a bank robber. If my manager, Norm, spied the scoundrel, he would intercept him at the counter. I can still see Norm removing a wadded up pullover, fingerling the price tag, and pressing the item to his face. When his eyes flashed with contempt, I knew exactly what he had smelled. The customer had purchased the
sweater, worn it out to the bar, and returned it, reeking of smoke, all without ever removing the tag.

Weekend rentals put us in something of a bind. If return policies are written to draw a line between the customer who is merely fickle and the one who is also manifestly unfair, the demarcation will inevitably be crude by virtue of its clarity, at once over- and underinclusive. Indeed, just as the mere removal of tags shouldn’t prevent a retailer from offering refunds to customers in all cases, the fact that a tag remains attached to a shirt that smells like it has been sitting in back of the Marlboro Man’s closet doesn’t mean a sales clerk should be obliged to give someone his money back, regardless of whether or not he produces a receipt.

Yet rules are rules, and while a store manager can safely bend them in favor of a customer, heaven help one who tries to make an exception for the good of the company. That’s why the weekend rentals were the worst. We were trapped, and the customers knew it.

L.L.Bean wasn’t so much trapped by its customers as it was cornered. The recent announcement by the Maine-based retailer that it was abandoning its legendary return policy brought me back to my time as a Sagebrush salesman and what it taught me about the ethics of customer service. In any transaction, fairness is always a matter of striking a fine balance between the interests on either side of the counter. It’s a simple lesson, but one that for L.L.Bean proved quite expensive.

Who bears the risk of being taken advantage of in a commercial transaction is a question that defines the ethics of customer service, and in the answer provided at either extreme, we find a familiar orientation toward the practice of business. At one end is Caveat Emptor, or Buyer Beware, a state of affairs in which the buyer accepts full responsibility for any regrets, whether they are a matter of simple indecision or a sincere belief she didn’t get what she paid for. At the other end, The Customer’s Always Right, a seller is willing to accept any amount of nonsense from her customers, regardless of its impact on business.

Rarely do we find epitomes of these two poles of commercial conduct. Extreme cases of Caveat Emptor are somewhat more common—think payday lenders, dodgy used-car dealers, the baggage policies of Spirit Airlines. But attempts to embody a pure expression of The Customer’s Always Right are exceedingly rare, which makes L.L.Bean’s efforts so unusual (and their end result so instructive).

Until quite recently, the 106-year-old retailer of clothing, recreational equipment, and a miscellany of goods for the great outdoors offered a lifetime return policy. Individuals were allowed to return any item from L.L.Bean, any time they wanted, no matter how long they had had it, and regardless of its condition. They didn’t even have to demonstrate that they had actually purchased the item, which effectively extended the guarantee beyond even the life of the buyer to individuals who were never L.L.Bean customers in the first place.

If this sounds like a crazy policy to you, you’re like most people learning of it for the first time. And yet, even as recently as a year and a half ago, L.L.Bean was proudly touting its “100% satisfaction guarantee,” a company commitment with terms customers were allowed to define for themselves. “We simply look at our guarantee as an extension of our customer service philosophy,” an L.L.Bean spokesman said in August 2016. “As a company, we have made a conscious decision to invest in our customers by standing behind our products.”

The occasion for the quote gives an illustration of the risk L.L.Bean was running, as well an indication of where things were heading: it came in the course of a column by Dennis Green, a retail-sales reporter for Business Insider, titled “I tested L.L.Bean’s legendary return policy by returning 4-year-old shoes.” The shoes in question were Green’s pecan-colored moccasins, a staple of the L.L.Bean catalog. Pictures in the article revealed that the shoes were scuffed and faded, and the stitching near the tongue of one had snapped. If the shoes were dissatisfying, they were dissatisfying in the way that all goods we’ve gotten a great deal of use out of are dissatisfying, which is to say, because they are not brand new.

This may not seem like a good reason to return the shoes, or any reason at all for that matter, but rules are rules. When Green presented the moccasins and said he was no longer 100 percent satisfied with them, the salesman merely took some “identifying information” before immediately processing the return. “No other questions about the shoes were asked.”

In the article, Green admitted to a momentary pang of conscience—“I did feel a bit like a jerk at the counter with my clearly very old and used shoes”—and he was quick to affirm that the guarantee had its limits. “Buying an $84 pair of shoes four years ago does not exactly entitle me to new shoes for the rest of my life,” he said, “and that is not the intent of the policy.”

Surely not from L.L.Bean’s perspective, and yet when a company orients its service around an absolute commitment to The Customer’s Always Right, its views on such matters are irrelevant. Just as Green determined that his satisfaction required the replacement of a well-worn pair of shoes, someone else could decide that $84 entitled him to a lifetime rental of pecan-colored moccasins.

It seems like a lot of people made just such a determination, or one like it, because this past February the company announced that it was rolling back its return policy. “Increasingly, a small, but growing number of customers has been interpreting our guarantee well beyond its original intent,” L.L.Bean Executive Chairman Shawn O. Gorman wrote in a letter posted to the company’s Facebook page. “Some view it as a lifetime product replacement program, expecting refunds for heavily worn products used over many years. Others seek refunds for products that have been purchased through third parties, such as at yard sales.”

If the renters were bad enough, that second group—the rummagers—had grown more conspicuous in recent years, inspired by stories such as Green’s and abetted by online flea markets, most notably eBay. L.L.Bean estimated that, in the past five years alone, “abusive” returns had cost it nearly $250 million, and tales of folks walking into its stores with garbage bags full of goods and walking out with hundreds of

Offering refunds for faulty stitching is a far cry from affording customers the opportunity to rent penny loafers for life.
Buyers aren’t always right, just as sellers aren’t always wrong. To assume the former is to make an angel of the customer, and to assume the latter is to suppose a devil.

dollars in gift certificates were proliferating. As a spokeswoman described the company’s predicament (striking a very different note from her colleague just 18 months before), “People are saying, ‘Oh, I lost 20 pounds. I can return everything for a new wardrobe.’ Or, ‘Grandpa died, so I’m going to clean out his attic.’” She continued. “[T]hat’s not reasonable or fair.”

Some customers disagreed, including Slate’s Justin Peters. As if to indict the scruples of journalists everywhere (or the stinginess of their employers), Peters, as Green did before him, acknowledged visiting L.L.Bean in order to exchange a well-worn pair of shoes, but he admitted to doing so every year for seven years in a row, the first time even receiving a $10 promotional gift certificate for his troubles. (“Not only did I get free shoes, I also got free money.”)

Despite the fact that his own mother had labeled the annual shoe swap a scam, Peters still protested the suggestion in Gorman’s announcement “that it was somehow dishonest for me and other customers to take L.L.Bean up on its policy.” Observing that the company had “made much of its lifetime guarantee” in online advertisements and on its website, Peters took something of a legalistic approach to the policy. Customers shouldn’t be “expected to be strict Constitutional originalists,” he said. “If the intent behind a given policy varies from the text of the policy, then it’s incumbent on the company to change the text of the policy to better reflect its intent.”

In other words, rules were rules. “If they didn’t want people to take the swap,” Peters declared, “they shouldn’t have offered it!”

Now, it’s one thing to observe that when a company maintains an absolute commitment to The Customer’s Always Right, it’s accepting the risk of being taken advantage of. But it’s another thing to contend that, by embracing such an approach, the same company is inviting bad behavior or even sanctioning it. I suspect that Peters (whose rant carries a tone of faux indignation) would not suggest to a young mother who complains about asbestos in the nursery walls and rats in the cupboard that when she decided to rent from a slumlord, she was more or less asking for it, but that’s essentially the logic he applies to L.L.Bean.

Rather than open season on the good will of buyers or sellers, another way of regarding business conducted under the express terms of Caveat Emptor or the Customer’s Always Right is as a commercial exercise in abject trust: either by buyers in sellers or by sellers in buyers. L.L.Bean often framed its “100% satisfaction guarantee” in just such terms. “Our guarantee is not a liability, but rather a customer service asset,” the company spokesman told Green, “an unacknowledged agreement between us and the customer, that always puts the customer first and relies on the goodwill of our customers to honor the original intent of the guarantee.”

If such a commitment seems foolish, it speaks to a general cynicism about the nature of human relationships of which, we sometimes forget, the hurly-burly of business is no small part. The gloomy view was not shared by Leon Leonwood Bean. “I do not consider a sale complete until goods are worn out and the customer still satisfied,” he said in 1916, four years after he founded the company that still bears his name. The absolute commitment to customer service was purchased at a high price almost immediately after he launched. In a three-page flyer he sent to nonresident hunting-license holders in Maine, Bean touted a waterproof boot that he guaranteed “to give perfect satisfaction in every way.” Of the first 100 pairs he sold, 90 failed this test when the rubber bottoms of the boots separated from the leather tops. The mistake nearly put Bean out of business, but he kept his word and refunded the purchase price for every disappointed customer.

Offering refunds for faulty stitching is a far cry from affording customers the opportunity to rent penny loafers for life, but one must willfully misread the company’s “100% satisfaction guarantee” to discover the second interpretation. This is the danger of putting Bean’s personal commitment to customer satisfaction into official company bylaws: it transforms an attitude of good will and close attention into a shield for shifty shoppers. Armed with an explicit and unbound guaranteed, they have a ready defense for dubious returns.

Rules are rules, but rules also change. In the case of L.L.Bean, the new set allows refunds for any reason within a year of purchase, and allowances are made for defects in “materials or craftsmanship” thereafter. (In a nod to rummagers, proof of purchase is now required.)

The new policy is not only more reasonable than the one before it; it attempts to be fair rather than hopeful. Buyers aren’t always right, just as sellers aren’t always wrong. To assume the former is to make an angel of the customer, and to assume the latter is to suppose a devil. We are all better off engaging each other with good faith and good sense, allowing for honest mistakes on either side of a bargain, not rip-offs and weekend rentals.

More from John Paul Rollert

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A Tale of Bitcoin Craze!

Crypto Madness

Presented in CryptoScope
In the past several months, I have been bombarded with students working on crypto projects. Two of our Global New Venture Challenge teams plan to issue cryptocurrency and use initial coin offerings (ICOs) to raise money. Our undergraduates organized a conference on crypto, and with little advance warning and almost no marketing, the house was packed to the gills. Entrepreneurs are coming out of the woodwork with new blockchain applications. What is crypto and blockchain, and is Bitcoin the next currency or a scam? When I set out to educate myself, I discovered a fascinating world of technology disruption and 21st-century finance in which supporters and detractors abound.

Plenty has been written, and is being written, about cryptocurrencies, Bitcoin, and blockchain. CBR had two such articles in its Spring 2018 issue: “The Bitcoin market isn’t irrational” and “The good and bad of blockchain.” I’ve noticed that many people are mixing and matching crypto-related terms with abandon, which has confused the heck out of me and most people I know, so this essay is intended as something of a primer that I hope is helpful. But I must start with a disclaimer: I am not a blockchain technology specialist, a financial industry lawyer, or a cryptocurrency expert. I’m just a person who would rather live in this brave new world with some knowledge than ignore the crypto craze and hope it just goes away.

Lesson 1: Bitcoin is, in fact, money. Typically, the word “currency” describes what the crypto crowd calls fiat money—paper currency made legal tender by the fiat of a government. Money is nothing more than a societal agreement that the currency we use—the US dollar, for example—has value, because a government backs the currency. As the government in question is the United States, that government backing is considered strong assurance that the money will retain an agreed-on value as people exchange it for goods and services.

But sometimes that societal agreement fails. National Public Radio’s Planet Money podcast produced an outstanding episode in 2010 called “How Fake Money Saved Brazil,” which chronicled a period in the 1980s when Brazilians lost faith in their currency, the cruzeiro. Rampant inflation destroyed the value of cruzeiros, making prices for basic items including food completely unpredictable and outrageously high. Some economists decided that the way to address the runaway inflation was to create a new currency—a fake one—which they called the unit of real value (URV). The government declared that all prices would be listed in URVs, and wages and taxes would be paid in URVs. The fake currency stayed stable while the number of cruzeiros per URV fluctuated. Gradually, people started to think in terms of URVs rather than cruzeiros. They began to trust that a quart of milk that cost one URV on one day would still cost one URV the next month. Eventually, the URV replaced the cruzeiro as the “real” currency in Brazil and was renamed the real (pronounced “hey-al”).

Inflation settled down and a long period of growth for the Brazilian economy followed.

What does this have to do with cryptocurrency? The first cryptocurrency was Bitcoin, and it, in fact, similarly represents an abstract...
Blockchain, being a new technology, is proving itself not quite ready for prime time.

A unit of value that can be exchanged for goods and services. That’s true predominantly in the virtual world right now—you can use bitcoins to pay for travel at Expedia, home goods at Overstock, technology at Microsoft, even satellite TV at Dish Network—but increasingly in the offline world as well. But a government isn’t backing Bitcoin and calling it legal tender—instead, a combination of technology and the societal agreement that has grown up around that technology gives Bitcoin its value.

The US government can issue dollars to help banks meet demand for cash, or to allow the government to buy back Treasury bonds. Simply speaking, the government manages the supply of currency to keep dollars valuable and liquid while avoiding the kind of inflation that troubled Brazil in the 1980s. The technology embedded in Bitcoin regulates how new bitcoins are created, owned, and traded and underpins Bitcoin’s value as a useful currency—the way government fiat does for the dollar. For example, Bitcoin’s creator set a permanent 21-million-bitcoin limit to create scarcity, theoretically increasing the value of the asset. Nearly 17 million bitcoins are circulating so far. The coins are created in a process called mining, by people who allow the Bitcoin network to use processing power on their computers to perform mathematical tasks and to store the database of bitcoin owners. A miner is compensated when this process generates a new bitcoin.

When a bitcoin is created, data about its existence and its owner are stored on a ledger that lives, in multiple copies, on many miners’ computers—a distributed ledger, in Bitcoin parlance. The technology that enables the ledger is blockchain, which uses math and processing power to encrypt information about each bitcoin and its ownership. It then batches up that information with other bitcoin transactions happening at the same time into a block and connects that block to every other transaction block in a chain. This creates for every transaction a permanent record that can’t be altered without changing the blocks before and after it in the chain of records. To trade a bitcoin, its owner needs to notify the miners who manage the chain about the trade, and their computers will verify and process the information about the current owner, new owner, time of the transfer, and amount exchanged—using complex math problems embedded in the blockchain technology. Finally, the miners will add the transaction to the distributed ledger on all the other miners’ computers. That level of distribution and connectedness makes the ledger secure.

The fact that the ledger is distributed rather than controlled by a central organization is what made Bitcoin so appealing to early users for online transactions. Payments don’t have to go through any banking system, aren’t tied to any specific offline currency or government, and are both anonymous and secure. This quickly made Bitcoin the de facto currency of the so-called dark web. According to Coinbase, a leading information service focused on cryptocurrencies, a mere five years after Bitcoin was introduced in 2009, transactions on six dark-web marketplaces topped $650,000 a day. Then the mass market adopted Bitcoin, increasing transaction fees and slowing down transaction speeds, and regulators woke up to this new currency, threatening the anonymity of the transactions. New cryptocurrencies such as Litecoin and Dash emerged to dilute Bitcoin’s hold on the underworld.

Lesson 2: Blockchain is more than a tool to create currency.

While Bitcoin was establishing itself as a useful currency, technologists discovered the power of the blockchain distributed-ledger technology. A financial transaction is like any other transaction—an action based on data and rules. Developers began to create blockchain systems for uses other than pure monetary exchange. The second largest cryptocurrency, Ethereum, isn’t a currency in the monetary sense. It is, instead, a platform on which developers can build new internet applications that take advantage of the security and decentralized aspects of blockchain technology. Already more than 500 gaming, messaging, social networking, news, and business applications are being offered as distributed applications, or dapps, built on the Ethereum infrastructure.
...A TALE OF BITCOIN CRAZE!
CRYPTO MADNESS
In this architecture, the coins or “tokens” are not intended as money to buy and sell things. Instead, each token grants a person the right to use some aspect of the app—for example, a token can allow you to play a game in an online arcade. Rather than buy a subscription or license for the software, users buy crypto tokens that allow them to execute transactions in the applications, essentially prepaying for using the system.

It is blockchain, rather than Bitcoin, that has corporate giants including Walmart, Maersk, and FedEx investing in a new generation of supply-chain solutions. Meanwhile, Bank of America, Mastercard, Fidelity, and IBM are the top four blockchain patent owners in the US.

**Lesson 3: The world has gone crypto crazy.**

Bitcoin has real value as a currency. Blockchain technology has the potential to enable new systems that could create enormous value. In that case, why are there so many detractors declaring crypto to be the next bubble, or even worse, a scam?

The answer is that there are problems in the world of crypto, including both the blockchain-technology mania and the cryptocurrency boom.

Blockchain, being a new technology, is proving itself not quite ready for prime time. Already, the original blockchain system is suffering scale issues. The network can process only about seven transactions per second, which is relatively slow. These transactions require so much processing power that Digiconomist estimates the current Bitcoin network is using enough electricity every day to power the entire country of Greece. That has set off alarm bells with environmentalists. It will take time for the technology to mature into a widely adopted, scalable infrastructure for new systems.

On the currency front, the problems are worse. There are now over 1,500 types of crypto coin and token. Bitcoin has a technology architecture that creates new bitcoins one by one, according to specific rules and through intensive computer processing, but other cryptocurrencies come to market through ICOs. In these, companies
create their own tokens and simply sell them. Why would anyone buy a brand-new cryptocurrency that has neither a track record nor an established market value? Theoretically, the value of the token represents what you can do with it in the blockchain network issuing it. For example, to use an application built on the Ethereum platform, you buy tokens that allow you to access and use the Ethereum-based dapp. But ICOs are frequently offered before there is any software ready to use—and sometimes with nothing at all to drive value for the tokens.

According to its creator, Dogecoin was started in 2013 as a joke, a parody of the many cryptocurrencies appearing in the market on the heels of Bitcoin. Buying Dogecoin cheaply and joining the community became an affordable way to get educated about cryptocurrency, and until April 2017, the market value of all Dogecoin was only $25 million. Then the market was hijacked by speculators and uninformed crypto investors, and its market cap soared to $2 billion this past January—for a currency that began as a joke! Dentacoin markets itself as the blockchain solution for the dental industry. With its website promising a test launch in the fourth quarter of 2018 and integration with health-care databases in 2019, Dentacoin also saw a market cap that topped $2 billion in January. By March, it had come back down to $91 million, still a hefty price tag for a token with no current use.

In the underregulated Wild West of crypto, self-proclaimed pump-and-dump groups brazenly advertise their membership opportunities. Get in, buy the designated cryptocurrency at a set time, then sell when the market thinks this is the next Bitcoin and jumps in.

In fact, according to ICOdata.io, a data-collection and ICO-rating company, 881 start-ups raised more than $6 billion in 2017 using ICOs, and by the beginning of April of this year, more than 500 companies had already raised more than $3 billion. This funding is not subject to the due diligence of angel or VC money; nor is it regulated, as is the emerging peer-to-peer equity crowdfunding market. As a result, the ICO market is rife with scams and failures. Bitcoin.com, a cryptocurrency news site, reports that nearly 60 percent of the ICOs offered in 2017 have already failed or are in the process of disappearing.

How does the investor sort the wheat from the chaff in choosing the tokens that will be useful and valuable in the future? Most people won’t be able to. China has already banned ICOs, and in Hong Kong, the government has placed an ad in the subway system warning its citizens to stay away from ICOs.

My take after all this? The advice of the Hong Kong government is wise. By all means, if you need to do business across borders with unknown parties and Bitcoin is the right way to proceed, buy bitcoins. If you want to own and breed crypto-kitties, or need a secure email system, or want to use a smart-contracts application that uses the Ethereum platform, buy ether tokens. But if you think cryptocurrency is a surefire get-rich-quick scheme, buyer beware.

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Want more policies based on evidence?

Medicine teaches us it will take time, effort, and investment

The push for transparency and regulation has been pervasive in many fields, perhaps nowhere more so than in accounting and finance. Just as securities regulation grew out of the 1929 market crash, in the wake of the 2007-10 financial crisis, the US Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act. The premise of this act and many prior acts is that transparency, clear rules, and better oversight will provide the sunlight and structure needed for markets to work efficiently.

Regulation, and even transparency, is not a panacea, of course. Economists have warned people for decades about the risks and unintended consequences of regulation. So how do we handle this? Evidence-based policy making is often proposed as a solution. It is a rigorous attempt to base policy decisions and new regulation on empirical evidence, including impact studies, cost-benefit analyses, and academic research in general.

This is a valid impulse, the appeal of which is obvious. Who wouldn’t want science and empirical evidence to guide policy decisions? Policy making that is more rooted in sound theory and ample data, and less influenced by political pressures and lobbying, should in theory lead to better rules and regulations. If rules were smarter, they would help prevent major accidents while encouraging, rather than obstructing “forward movement”—becoming the regulatory equivalent of guardrails, like those on highways and racetracks.

But if we are serious about policy making that is supported by facts and data, we have to create the research foundation to support it. It is one thing to say evidence-based policies would be a good idea, but bringing this type of rulemaking to accounting and financial regulation (my area of expertise) would require substantial investments in an infrastructure for conducting, aggregating, and sharing research in these areas. Evidence-informed policy making is doable, but it would require time, effort, and money. Looking at medicine—a field that started going down this path many decades ago—illustrates this point.

**Medicine—an aspirational example**

Policy makers and regulators are under pressure to embrace a more evidence-informed approach. I saw this up close, through my work with the Public Company Accounting Oversight Board, which oversees auditors, and the Financial Accounting Standards Board, which the US Securities and Exchange Commission designated to set accounting standards for public companies. The FASB, among other standards setters, has recently started conducting postimplementation reviews of its standards. The PCAOB and financial-market regulators are conducting similar reviews. In the United States, several congressional initiatives are under way that would require formal economic analysis. In the United Kingdom, financial agencies are required to conduct cost-benefit analyses for proposed rules.

But evidence-informed policy making is easier said, or demanded, than done. At present, research in accounting and finance is still far from collecting the data and amassing evidence that is needed for evidence-based policy making.

In this, we can learn from research in medicine. Evidence-based medicine—which, as its name implies, is systematic reliance on the findings of modern, well-conducted research in medical decision-making—is one of the most important breakthroughs in medical care. According to the *BMJ* (formerly the *British Medical Journal*), it’s up there with the discovery of antibiotics. Yet it took a lot of effort, and decades, to make that happen.

It involved researchers holding courses and conferences, writing journal articles on the idea, creating extensive guidelines for research and systematic reviews, and developing databases. It also required a great deal of financial support. The Cochrane Collaboration is an independent organization formed to organize research findings so as to facilitate evidence-based choices about medical interventions faced by doctors and policy makers. It is a global independent network of thousands of researchers from 130 countries who “work together to produce credible, accessible health information that is free from commercial sponsorship and other conflicts of interest.”

This effort provides an example or standard to which we in other fields can only aspire.

**The challenges**

At a higher level, finance and accounting have some similarity to medicine. While medical researchers study the effects of drugs, we study the effects of regulations. Does a new regulation help or hurt? Were specific provisions in Dodd-Frank worthwhile? These are, in a way, questions similar to those asked in medicine.

That said there are many differences. For one, researchers in accounting and finance face several major challenges that medical researchers often do not in terms of data collection and research design. First, the rise of evidence-based medicine has been closely connected to randomized-control trials, which are frequently used to test the
efficacy of a drug or medical intervention. In an RCT, participants are randomly assigned to groups in which they end up receiving the treatment being studied, or a placebo. The results of different groups are then compared. For example, a study might give 100 mg of a drug to a group of patients, then measure the dose’s effect on mortality. If people in the group receiving treatment do better overall, this suggests a causal treatment effect from the drug, which then can be used in formulating practice guidelines or perhaps even policy.

RCTs are the gold standard in medical research, but they’re less used in finance and accounting, where it’s tough to run such studies in many settings. We typically cannot randomly assign rules (or treatments) for the most important regulatory issues that we’re facing. As a result, we have to rely on observational data and outcomes without randomization. Based on such data, it’s tough to know whether new laws, rules, or regulations will change by X percent, and the cost of capital will drop by Y percent.” To do this, we’d need a lot more research, and accounting—as we have fewer studies, and not many involving randomization. Having meta-analyses would improve the reliability of the evidence we could share with regulators, and it would help researchers communicate robust findings.

Thus we have work cut out for us—we need to do a better job measuring induced policy changes and identifying causal effects, and we need much more research on each policy issue. These challenges are quite daunting. But if the goal is more systematic use of evidence in policy making, we have to overcome these challenges.

To me, the glass is half full. Yes, there are many challenges and we have to tread carefully, but there are also the costs of poorly designed or implemented regulation too. So if we want to head down this path, it requires time, effort, and investment. Here are four steps to get us started.

1. Obtain and create more and better data.

We’ve seen an explosion of data in the social sciences, but data availability is still a big challenge. In accounting and finance, much of the relevant data are often proprietary or not observable to researchers. As a result, researchers rely on relatively crude or highly aggregated proxies.

To explain: most of the data sources we work with—say, consolidated financial statements—are highly aggregated. A single corporate document encapsulates the performance of hundreds of subsidiaries and aggregates thousands of transactions. As a result, when we talk about the effect of an accounting standards change, we’re drawing our conclusions from what are essentially summaries of business activity rather than detailed evidence of the effects of the new standard on the actions of individual subsidiaries and decision makers.

We can create a broad pool of the kind of confidential data we need to promote research for informed policy making.

Consider the case of a change in the accounting standard for when a company takes an impairment—that is, when it adjusts the value of an asset on its balance sheet to reflect a lower market price. To see how the new standard changes impairments, we would have to, at a minimum, calculate what the impairment would have been under the old standard and see how much it changed under the new standard. Yet, when we see an impairment charge, it’s typically aggregated and reflects many assets and decisions, and is potentially conflated with a lot of other things, including current business conditions. This makes it difficult to see solely the effects of the new rule.

To know the new accounting standard is working the way it’s supposed to be working, we’d also want to see what the company considered when deciding whether or not to take an impairment, including what it considered in situations that did not lead to an impairment. But for us to study the issue at such a granular level, we would need companies to track this information and thus create the data. We’d need data-keeping requirements built into regulations, as otherwise companies or their auditors likely would not collect the necessary data.

Toward this end, we need the help from policy makers. Moreover, such data are obviously highly proprietary. Thus, we need to find ways to access and share these data in a confidential manner. The PCAOB, for example, has created a Center for Economic Analysis, which maintains proprietary data such as which auditor has been assigned to a particular job, how many hours an auditor bills, how an auditor rated client risk, and so on. This center, for which I worked in an economic advisor, has made these data available, with certain safeguards, to academic fellows who apply to it with research projects. There are similar arrangements at the US Census Bureau. This shows that there are ways to share data and make them available for analysis without violating confidentiality, and that we can create a broad pool of the kind of confidential data we need to promote research for informed policy making.

2. Increase reliability and replication.

If research is to inform policy, the reliability of our findings is obviously critical. Unfortunately, there’s increasing evidence that replication rates in the social sciences are quite low. For instance, in psychology, a large group of scholars pooled their efforts for something called the Reproducibility Project, and set out to replicate some of the most important studies in the field. The findings are the subject of some dispute,
The UChicago Crime Lab takes a cross-disciplinary approach . . . why not have a financial-regulation lab?

but fewer than half the studies they set out to validate could be reproduced. A similar effort in experimental economics also indicates reproducibility rates well below what would be implied by reported statistical significance levels in the underlying studies.

One might argue that the heavy reliance of accounting and finance research on easily accessible databases should increase the reproducibility, and it might. But this research is also often forced to lean on naturally occurring or quasi experiments (ones in which the experimental conditions are determined by forces other than the researchers), which arguably gives more discretion to researchers. Thus, the jury is still out on the reliability and reproducibility of research in accounting and finance.

Besides, there is increasing evidence in many fields, including economics and accounting, of published studies showing patterns that are consistent with selective reporting of statistically significant results.

What to do? We need to find ways to boost the reliability of our findings. More replications are surely part of the solution. And we would need journals or platforms to publish these results (including “null” results that don’t appear to find a hypothesized effect, which are often difficult to publish). Moreover, we need more research that tests similar questions in slightly different settings, as this would help researchers gauge the robustness of their findings.

The Critical Review of Finance has created a Replication Network—a welcome initiative. Pre-registering studies—publicly committing to a plan in advance, before gathering data—could help mitigate issues related to researcher discretion. Ultimately, we need to explicitly discuss the reliability of our research findings and discover ways to counter the shortcomings in the research and publication process.

3. Improve transmission of research findings.
If uncovering and validating relevant evidence is one-half of evidence-informed policy making, the other half is conveying that evidence meaningfully and in a neutral fashion to policy makers. There are various ways that research can be influenced or misrepresented on its way to policy makers.

And even if research findings arrive intact, policy makers might misunderstand or even misconstrue them. For one thing, they might have an incentive to cherry-pick evidence to legitimize their chosen policies. As Princeton’s Alan S. Blinder put it, “Economists have the least influence on policy where they know [and agree] the most; they have the most influence . . . where they know the least and disagree most vehemently.” Setting political influence aside, there is the question of training—do policy makers have the time and skills necessary to interpret social-science-research findings and especially their limitations? If not, do they have the support needed to make sense of the evidence? For these reasons, we cannot leave the transmission process of research findings to its own devices.

It could help to aggregate findings by policy issue or question, creating clearinghouses for research studies and systematic reviews along the lines of the Cochrane Collaboration in medicine. Cochrane’s systematic reviews gather all available primary research and summarize the best evidence. They evaluate the strength of the evidence, look for biases, conduct meta-analyses, and provide conclusions and implications for practitioners.

We could create something similar for finance and accounting research. Such clearinghouses could conduct systematic literature reviews on certain policy issues, using explicit criteria for evaluating the strength of evidence as well as structured summaries that would help policy makers.

We’ve seen clearinghouses emerge in other areas of economic study. The US Department of Labor’s Clearinghouse for Labor Evaluation and Research is an example of this: it not only summarizes the findings of research in 14 areas of labor economics, but also assesses the quality of the research design and methodology. In my view, the idea of clearinghouses is appealing and a step in the right direction, especially if they are operated independently and their reviews follow scientific guidelines. And related to my earlier suggestion, we could even stipulate that regulators and companies provide certain data to these clearinghouses around regulatory changes, so that these data could be analyzed, which would further promote research on regulatory questions.

4. Encourage cross-fertilization.
Accounting, finance, and many other fields relevant to financial policy are often organized by research method, without much cooperation between these methods. There’s even less cooperation and cross-fertilization across fields—finance, accounting, economics, and sociology often operate in silos. However, policy questions do not live in these silos; they cut across them.

Part of the infrastructure for evidence-based policy should include research circles organized around topics and questions rather than fields and methods. We could convene conferences on regulatory issues and encourage broad participation by people from different areas. We could create journals that focus not on discrete academic disciplines but on all the research relevant to particular policy questions. The UChicago Crime Lab takes a cross-disciplinary approach to understanding and preventing crime; why not have a financial-regulation lab?

We can’t have it both ways.
Plenty of people think the regulatory burden is already high enough, perhaps too high. For them, some of the suggestions and in particular a call for more data-keeping requirements for companies might sound like another onerous responsibility. But if you think that policies are costly to business and that policy makers are sometimes overshooting, this is all the more reason to study regulation and its effects. The fact that many regulations are perceived to have unintended consequences and come with high costs is exactly why businesses and societies need to invest in smarter rulemaking informed by evidence and research. To fix something, start at the foundation.

With concerted effort and investment, we could make significant progress toward more systematic use of evidence in policy making. Without it, we will only pay lip service to the idea.

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Free markets for free men

Personal freedom and market freedom go hand in hand

BY MILTON FRIEDMAN

Do free markets make free men, or do free men make the free markets? That might seem like a play on words or a purely semantic question, but it is not. It is a very real and very important question, and I think it contributes a great deal to understanding the kind of world we live in, and might live in.

One’s offhand impression is to say, “Well it must be free men who make free markets.” There’s an element of truth in that, but I think to a far greater extent, free markets make free men and not the other way around.

It’s true that there have been free men who have made free markets. The founders of the United States were free men who believed in individual and personal freedom, and they set up a constitution that was designed to preserve free markets. But many people who regarded themselves as free men have produced totalitarian societies. The intellectual creators of the Soviet Union would have called themselves free men and would have said that they believed in individual and personal freedom. Yet they created not free markets but controlled markets.

I believe that free markets have historically been made much less by free men than by accidents of circumstance. The founders of the American Constitution did establish free markets, but what really preserved free markets in the US were not the philosophical ideas of the founders. It was a fortunate accident that in the 1830s, when state after state went in for government control and government activity, the government projects were failures.

At one time, the State of Illinois had state-owned and operated banks. They failed and went out of business. There was an enormous movement in the early 19th century for states to construct canals and railroads, a movement toward what today we would call socialism or national enterprise or central planning on a state level. But the crisis of 1837 wiped them all out. It was that accident, more than the...
philosophical ideas of the founders of the US, that preserved free markets in the US.

The experience of Great Britain was somewhat similar. There was a conscious, ideological movement known as the Anti-Corn Law League—by corn, as you know, at that time the British meant all grains, including wheat—and what stimulated free markets in that country was popular opposition to tariffs on food imports. That opposition was blown up by the Anti-Corn Law League into a fight of the grasping, selfish landowners against the ordinary people, and that’s what destroyed the tariffs. If you don’t have tariffs, it’s almost impossible to have anything other than free markets. The greatest defense of free markets is free trade among countries.

So I believe that you cannot really say that free men make free markets. They may or may not. But you can say with great certainty that free markets make free men and that controlled markets destroy free men.

This is more than symbolism; it is reality. If you look at our historical record, you will see that very clearly. It’s interesting to contrast the tycoons of industry of the 19th and the 20th century. The tycoons of industry of the 19th century, at a time when we had truly free markets and almost no governmental intervention, were men of independent mind and independent thought who were willing to stand up and say what they thought and what they believed. They were willing to express their opinions on affairs, wherever the chips might fall. The tycoons of the 20th century are people who have learned how to get around Washington. The criterion of success is that you know how to butter up the right people and get the right governmental regulation, or laws, or interpretations.

If you want to see the effect of the absence of free markets on free men, I ask you to contemplate the state of free speech in the US today. How many people in the US today enjoy freedom of speech in the literal sense, in that they feel free to get up and say what they believe, honestly and freely, without fear of the consequences? I believe that only those of us who happen to hold tenured positions in private universities are today pretty fully assured of freedom of speech.

If you are the president of a great corporation, would you really feel free to get out and express your frank opinions? You would risk violating the interests of your stockholders if you stood up and said the wrong thing. Because there are too many legal and extralegal ways in which

The average American citizen is free to spend, at most, 60 percent of his income.
If you’re a businessman building a factory, you may not be free as to how to build it or where you build it. In fact, we are free to dispose of probably a good deal less than half of our income.

In October 1974, US President Gerald Ford got a couple of companies to agree to a “voluntary” embargo on sales of grain to Russia. I may have missed it in the papers, but I heard few voices sounding off about what a disgraceful and intolerable action that was, what a violation of human freedom it was to stop those sales. Why didn’t people sound off? Was it because they believed it was a desirable thing? Was it because they believed it was consistent with a free society that, without there being a law, a governmental official should be in a position to say to companies, “You stop that sale or else”?

If you had been the head of one of those corporations, you would have gone along too. Why would you have gone along? Not because you believed it was morally justified, but because you would have been afraid of what might happen to your income-tax returns, or whether your company would be slapped with an antitrust suit, or whether you would be charged with breaking some other law.

There should have been an outcry on that voluntary restriction on exports. There should have been an outcry first because it was done by extralegal means, and not as a result of legal authority. Equally important, the prevention of those exports was a violation of the economic freedom of the people of this country.

The typical analysis of that embargo is that US consumers gained and farmers lost by having a lower price of wheat than would otherwise have existed. That is the ordinary kind of superficial analysis that leads to so much bad economic policy. Consumers as well as producers lost. The effect of our selling less wheat to Russia was that we acquired less foreign exchange; the result of that was to make the price of the dollar in terms of foreign currencies lower than it otherwise would be; the result of that was to make foreign goods more expensive than they otherwise would be. So the consumers got cheaper wheat and dearer perfume, cheaper wheat and dearer wine.

Let’s suppose prohibiting the exports lowered the price of wheat by 10 cents per bushel. Suppose instead that a tax of 10 cents per bushel had been imposed on every farmer and a subsidy of 10 cents given to every potential purchaser of wheat. Then the farmers would be in the same position. We then have to ask whether the people who got that subsidy would choose to spend that money on wheat. Not at all. The customers would choose to spend some of that money on French perfume and some of that money on Portuguese wines. So the fact of the matter is that what you did by imposing the embargo was to say to the American consumer, “Even though you would like to trade some of your wheat for some French perfume, we’re not going to let you do it. You’ve got to consume wheat whether you want to consume wheat or not.”

All I’m giving you is the general argument for free trade that Adam Smith developed two centuries ago.

With free trade, consumers decide how they would like to use their income and what they would like to buy with it. When a tariff is imposed on a foreign good or an export quota on a domestic good, consumers are forced to spend their income in ways that they would not spend it if they were free to do what they wanted. In that sense, the embargo was a restriction of the freedom of the consumer, as well as the freedom of the producer. It transferred income from the farmers to the consumers, and it hurt all consumers as consumers by denying them freedom of choice about how to spend their money. That’s what all of us should have been saying in the newspapers at the time.

Now free markets are on the defensive all over the world. Why? They are on the defensive not because they haven’t worked, but because they have worked. It’s precisely because every time political authorities have tried to do without them, they have gotten into trouble. The only way political authorities have found to pay for their mistakes is to try to take advantage of the free market by interfering with it and by controlling it. The long-term trend has clearly been toward greater governmental control. I’ve cited the figure of 40 percent as the percentage of our national income being spent by government. That number was 10 percent in 1929. It’s gone up from 10 percent to 40 percent. If you want to look forward to the future, I will predict one thing with absolute certainty: that will not happen again. The percentage cannot go up to 160 percent in the next 40 years.

*Milton Friedman was Paul Snowden Russell Distinguished Service Professor of Economics at the University of Chicago. He died in 2006.*
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SHOULD COLLEGE ATHLETES BE PAID?

In the United States, college sports have long been a lucrative business. The National Collegiate Athletic Association, which governs athletics at more than 1,100 schools, generated upwards of $1 billion of revenue in 2017. But while college athletics generates a lot of money, compensation for athletes is meticulously limited. To be eligible to play NCAA sports, players must maintain amateur status, which means they can’t be paid for participating, though they can receive scholarships to live and study at their respective schools. Do the NCAA’s rules restricting player compensation benefit schools at the expense of players? When Chicago Booth’s Initiative on Global Markets polled its US Economic Experts Panel, the vast majority of respondents agreed that they do; none of the panelists disagreed.

**Question:** NCAA Division I schools coordinate compensation for men’s basketball and football players (precluding actual pay and limiting nonmonetary benefits), providing rents to member schools (which may be shared with others) at the expense of those players.

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**Austan D. Goolsbee, Chicago Booth**
“A top NBA coach gets $7 million–$8 million per year, and a top player makes four times that. A top college coach gets $6 million, but the players get nothing.”

*Response: Strongly agree*

**Michael Greenstone, University of Chicago**
“Only hesitation in complete agreement is that there is lots of redistribution across sports and even within basketball/football players.”

*Response: Agree*

**Robert Hall, Stanford**
“Wrong question. Should be: ‘Are the NCAA’s limitations on contracting with athletes socially harmful?’”

*Response: Agree*

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**See more online**
All responses to this poll can be seen at igmchicago.org/igm-economic-experts-panel.

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About the IGM Economic Experts Panel
To assess the extent to which economists agree or disagree on major public-policy issues, Booth’s Initiative on Global Markets has assembled and regularly polls a diverse panel of expert economists, all senior faculty at the most elite research universities in the United States. The panel includes Nobel laureates and John Bates Clark medalists, among others. Questions are emailed individually to the panel members, and panelists may consult whatever resources they like before answering. Members of the public are free to suggest questions.
ARE FINANCIAL MARKETS TOO FAST?

Chicago Booth’s Eric Budish, former Commodity Futures Trading Commission commissioner Sharon Y. Bowen, and Chicago Trading Company’s Steve Crutchfield discuss how speed affects financial markets and what, if anything, we should do about it.

**Do US regulators have the expertise and the technology to regulate these very-high-frequency markets?**

**Bowen:** I believe we do. We do have the resources and the expertise, but having said that, I’ve been a big critic of the fact that the Commodity Futures Trading Commission has been woefully underfunded for years. And if we had more money, we could have better technology. But we do have the expertise to oversee these markets.

**Crutchfield:** One question that we often wonder about is if the focus of the regulators is correct when taking a look at these markets. For example, particularly when we talk about some of the issues of latency-minimizing trading—trading at the fastest possible speed—there’s some question about whether the regulators are focused on addressing the issues around incentives that arise from that type of trading or whether they’re more focused on looking at individual rules as they’re submitted and filed by exchanges, which may in isolation be appropriate, rather than always looking at the entire market structure that’s created as a result of these rules piling up over many years.

**Budish:** The markets are more difficult to regulate than they could be because of the importance of speed and because markets are trading literally as fast as technologically possible. If you’re trying to surveil markets, you have to take special relativity into account to figure out, did this thing in Chicago happen before or after this thing in New York? It’s possible to do so, but it’s more difficult and more complicated than could be the case if markets were architected differently.

**In the United States, markets are expected to regulate themselves. Does that self-regulation work?**

**Bowen:** I think it does. It really is a good balance of resources and expertise at the same time. I think most of the exchanges have great governance practices. For example, at the New York Stock Exchange, we have a separate regulatory oversight committee—separate from the membership committee—that is responsible for surveillance over markets.
As regulators, we’d never abdicate our authority, obviously, but for routine registrations, licensing, and market surveillance, I think it is a good balance between the agencies and the self-regulatory organizations, in that respect. You have to also remember these are really competitive markets, and so the likelihood that one player is going to go out and game the system? It’s not going to happen for very long. These guys tell on each other as well.

Crutchfield: Yeah. At the New York Stock Exchange and other markets, I’ve seen very good separation of business decision-making, customer service, and sales, and then a regulatory arm. Often there’s a chief regulatory officer who reports up through a different channel to a different board.

However, I think there are some questions about not the surveillance enforcement, but actually the rulemaking itself, and to what extent the exchanges are promulgating rules that protect investors and the public interest. Part of the problem is that exchanges, although they’re expected to do that on a case-by-case basis—the SEC [Securities and Exchange Commission], for example, will ensure that the rules at least don’t do the opposite of that—there’s nonetheless a question about, what are their incentives?

Unfortunately, in many cases, what exchanges are incented to do is to find the market participants who are the most elastic in terms of price, in terms of incentives, in terms of what technological advancements they can make, relative to trading on a particular exchange. Those most-elastic participants, the ones who have the ability to move their volume elsewhere because of that competitive dynamic, are very often large institutions.

And those large institutions may have found a way, I wouldn’t use the phrase “game the system,” but may have found a way to really profit from existing at the very bleeding edge, that “special relativity” world Eric was talking about. And often, incentivizing and rewarding the firms that have found a way to exist at that level can lead to consolidation, create oligopolies, and reduce the number of market participants who are out there providing bids and offers for investors to trade with. And ultimately the function of markets is to encourage aggressive bids, right, aggressive offers, attractive prices that investors can look at on their retail brokerage website. And providing incentives that create the best environment for a small number of institutions willing to spend all that money to live in that world of special relativity does not always have the result of ultimately providing the best prices or the best experiences for investors. And that’s something we’re concerned about.

Bowen: Yes, the market structure has changed, and we do have different people bringing liquidity to the markets than was the case a few years ago. When the banks were liquidity providers, they were less likely to provide it in periods of stress, because of capital constraints. When you take a look at things like flash crashes, for example, I think people presuppose that it’s the HFT [high-frequency trading] guys who flee the market, and that just hasn’t been the case. They tend to be there, and they’ll provide liquidity because banks can’t do it because they’re constrained by capital costs.

We find that more liquidity in the market means tighter bid-ask spreads, which means the costs are cheaper for investors. I am not advocating for one player versus the other in the market, but I do think the market should dictate the products that are acceptable, with caveats—there should be a fair market for investors who choose those products.

Is it harder to regulate high-frequency-trading firms because they’re such big customers of exchanges?

Budish: Competition among exchanges has worked extraordinarily well on some dimensions and poorly on other dimensions. The dimension on which it’s worked extraordinarily well is trading fees. Fees are about .01 pennies per share traded, once you work through all the complexity. So if you go to StubHub and buy a $100 concert ticket, you’re paying $20 worth of fees. If you go to the New York Stock Exchange and buy a $100 share of stock, you’re paying .01 pennies of fees. That’s a big difference.

The dimension on which exchange competition is a lot less fierce is the sale of colocation and proprietary data feeds. So, selling speedy access to exchanges’ most latency-sensitive customers, those fees have gone up noticeably over time. Exchanges have market power over the sale of colocation and data. Only the New York Stock Exchange can sell fast access to the New York Stock Exchange.

That dynamic, then, is a friction against market-design innovation, because if you think about an exchange’s incentive to adopt new market designs that reduce the importance of speed in today’s markets, such an innovation is good for the market as a whole, I would argue, but hits the one piece of an exchange’s business that’s any good, and that gives exchanges market power.

So, I think that that’s a friction against innovation. Something regulators could do that would be short of mandating a reform to market designs would be to at least to proactively clarify that new market designs are allowed, but even that’s been a step too far for US regulators.

Bowen: It depends on how you define the market. I think you’re right that speed costs money. But not every market is liquid. You don’t see HFT in those illiquid markets. So I don’t think it necessarily
stifles innovation. Not every market is standardized and liquid, so you’re not going to get innovation in every market. There’s just too many of them.

Crutchfield: Are regulators going to create the perfect market? Do we expect that of our regulators? No, I don’t think we expect it. I don’t think we want it. The goal of the regulator is to create the sandbox within which everyone can play fairly according to the rules.

A challenge that we have right now is that not only are regulators not encouraging, but in some cases they may not be allowing the type of innovation that we are talking about. So, for example, there is a proposal from the Chicago Stock Exchange to introduce a speed bump for liquidity takers. The idea is, if a firm sends an order that’s going to remove liquidity from the book, it’s held up for a very de minimis period of time—350 microseconds in that proposal. That proposal was suspended by a commissioner of the SEC unilaterally for an indefinite period, and it’s just kind of hanging out there. We’re not sure if that’ll ever be even given a chance to become part of the competitive landscape.

I would argue that for many liquidity providers, my firm included, the biggest obstacle that we see to providing better liquidity and showing better prices for investors is this risk of sniping, or pick-offs, which happens when other advanced firms with very sophisticated technology are a microsecond or less faster than another firm at reading some event that’s publicly available on a price feed somewhere. That will cause us or another market maker to incur a trade that is immediately regretted. And to the extent that that happens, market participants start to price that in. The cost, ultimately, is worse prices for investors.

To the extent that a small number of firms have invested huge resources in being able to operate in that environment, where microseconds and nanoseconds matter, those firms have an advantage. You could say, “Well, they deserve to survive.” But ultimately that goes counter to investor protection and the public interest. In order to enter the market right now and provide better prices to investors, a professional trading firm has to solve a massively expensive technology program, tens of millions of dollars at a minimum. That’s basically the equivalent of a regulator turning to market participants and saying, “Oh, if you want to trade in the market and provide liquidity and better prices to investors, every time you respond to a market tick, you have to compute the first 1 billion digits of pi.”

We could make that a requirement, but why would we? Why impose this massive technology burden?

What are “speed bumps” that could slow down trading?

Budish: My specific proposal you could think of as a type of speed bump, where time is treated as a discrete variable. So time might be broken down into, say, milliseconds, a thousandth of a second, 23 million units of time per day. And orders that reach the exchange in a particular millisecond are all processed in a batch process at the end of that millisecond using an auction. So, most milliseconds, for most stocks, nothing happens. Sometimes in a millisecond, an investor shows up and wants to buy 500 shares at the ask or sell 200 shares at the bid. In that case, the auction processes that requested trade almost exactly in the same way as the current market.

The difference is, if in a particular millisecond there is a burst of activity, which is typically algorithmic traders responding to some price signal, then processing that burst of activity in a batch using an auction ensures that competition is on price and not speed. And it protects liquidity providers from being sniped at an adverse price instead of trading at a price that is a market consensus based on an auction. So, it’s reengineering competition at the millisecond level. (For more on Eric Budish’s research on batch auctions versus continuous trading, see “An alternative to high-frequency trading,” Fall 2013.)

Bowen: But it seems to me that that’s in fact creating the kinds of dark pools we were trying to get away from. I mean, I think we really want transparent real-time trading markets. I, as a market participant, would not want a regulator to set what that speed bump would be.

Crutchfield: From a regulatory standpoint, we generally don’t allow shares to be traded in increments

“I, as a market participant, would not want a regulator to set what that speed bump would be.”

— SHARON Y. BOWEN
of a single share; those orders are called “odd lots.” There are special rules around odd lots, of course, but generally you have to trade 100 shares at a time. Or one options contract, or one futures contract.

Generally, you have to trade in certain price increments: options trade in increments of pennies and nickels and dimes, shares generally in pennies, futures often in quarters. But for some reason, many in the market seem to hold the view that on the time axis, we should allow an arbitrary amount of compression, even when there’s no further benefit to investors but just a gaming opportunity that’s created.

**Does it make sense for the US to separate futures regulation and securities regulation?**

**Bowen:** I think the division definitely makes sense, since our equities markets are a way for companies to finance operations and growth. The futures markets have been historically used for risk mitigation and price discovery. Having said that, of course people do trade across asset classes, across time zones, across currencies, and I think that’s fine. But I think the two agencies [the SEC and CFTC] actually complement each other in some respects.

If you look at Europe, they are still grappling with growing their capital-markets union. Their companies basically rely on banks to lend them money to fund their growth. In Asia, they’re talking about lowering their standards to get more people to list. I frankly think our capital markets are the envy of the world. I think this system really does work.

**Crutchfield:** I agree. I will say, though, that there are sort of these muddled areas in the middle, right? You look at S&P 500 index options, there are securities options and there are futures options that are basically the same thing. The CME [Chicago Mercantile Exchange] can’t list European-settled S&P 500 futures options that expire on the third Friday of a month because CBOE has those listed in the SEC-regulated world. It would be nice to have a regulatory structure where some of those middle areas ended up cleanly on one side or the other.

**Budish:** There are gray-area products that are not quite pure. There is a large economic difference between capital formation for corporations and futures contracts. There are a lot of products that live in the vast gray area. The XIV exchange-traded fund, for example, was a product that was not about capital formation for Apple or Microsoft.

**Bowen:** But even a recent Treasury report on the financial markets concluded that the cost of merging the two agencies outweighs the benefit. This discussion happens every year pretty much. And the decision is the same: it’s a bad idea.

**Are cryptocurrencies in something of a regulatory black hole? Should they be regulated?**

**Bowen:** I actually don’t think they’re in a regulatory black hole. At my former agency [the CFTC], they determined cryptocurrencies to be commodities, and I think that’s the right answer. And I think the CFTC and the SEC have been pretty proactive in making sure that the investing public is aware of a lot of the false advertising and the false marketing of various schemes to invest in these cryptocurrencies.

I think the regulators are doing a good job of taking notice and being aggressive, particularly on the retail side, where they see retail investors getting harmed—which is the right approach—but at the same time not stifling possible innovation that could come from the blockchain technology, for example. So, I think they’re taking a good, cautious approach without stifling innovation.

**Budish:** I agree with everything Sharon just said. If you think about the formation stories of futures markets and of stock markets that we teach students, with futures markets we always talk about wheat contracts and a farmer who wants to hedge the future price of wheat. And when we’re teaching about stock markets, we talk about an entrepreneur who needs to raise capital and who goes to the capital markets to raise capital for her venture.

For Bitcoin, I haven’t heard those kinds of stories yet—the real economic uses of cryptocurrency—aside from buying fake IDs and drugs on the dark web. I’m waiting.

**Bowen:** I think we’re all waiting.

“The goal of the regulator is to create the sandbox within which everyone can play fairly according to the rules.”

— STEVE CRUTCHFIELD

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Is that new factor useful for investors?

Factor investing is gaining in popularity, and the list of factors to potentially consider when evaluating stocks is long and growing. This “zoo” of factors needs to be tamed, according to City University of Hong Kong’s Guanhao Feng, Yale’s Stefano Giglio, and Chicago Booth’s Dacheng Xiu. They argue that the hunt for stock characteristics, or risk factors, that can predict high returns for investors may be producing factors that don’t really explain stock prices. This can happen, for example, if a new factor is correlated with a more established one, making the new factor redundant. The researchers establish a method to test a proposed factor’s value, assessing how well it explains stock prices beyond all other factors that came before it. Learn more about the research on page 24 of this issue.
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Page 50