THE BEHAVIORAL REVOLUTION IN FINANCE

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Behavioral finance took off in the late 1970s and early 1980s with contributions by David Dreman, Robert Shiller, Hersh Shefrin and Meir Statman, and Richard Thaler and myself. Research suggested that the investment portfolios of many people were distorted by false beliefs and unreasonable choices, that there was excess volatility in stock and bond prices, and that it was possible to profit from investor sentiment by going against the crowd, i.e., exaggerated expectations often cause share prices to overshoot. Soon, this small group of economists was meeting regularly with psychologists (including Paul Andreassen, Colin Camerer, and Daniel Kahneman) at the Russell Sage Foundation in New York.

Five or six years later, the National Bureau of Economic Research began organizing semi-annual meetings. What was started by a few eccentrics --ridiculed for their "ignorance" of efficient markets-- eventually became a middle-of-the-road movement, a behavioral revolution with spillovers in accounting, marketing, management, experimental economics, game theory, political science and law. Since that time, behavioral finance and behavioral economics have generated a good deal of heat --a flood of academic papers either mocking or accommodating its ideas. The movement teaches MBA and Ph.D. level courses, it publishes textbooks, and it advises practitioners that

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"behavioral finance may improve the bottom line." Meanwhile, world financial events (the crash of 1987; the bubble in Japan; the demise of LTCM; the Asian crisis; the dot.com bubble; the financial crisis of 2008) have compelled non-academics, e.g., investors or business journalists, to take notice as well. Who can discuss these dramatic episodes, and what they mean for the future of capitalism and the financial industry, without making mention of market psychology?

Chances are that all this attention, all this success is good. But it also muddies the waters. It worries me. Today, behavioral finance is a contested term. What does it mean? I begin by reviewing a few basic questions. After that, my aim is to assess the strengths and the weaknesses of behavioral finance, and to discuss its future.

Modern finance

Let me start by briefly defining finance itself**.** Even though the two are linked, it is customary to make a distinction between the real economy and what goes on in the world of money and finance. The real economy is where goods and services are produced and consumed, and where wealth is created. The world of finance, aside from market bubbles and other disruptions, sometime severe, is seen as a sideshow.[1] Nonetheless, finance serves several critical functions: The payment system, the pooling and transferring of funds, sowing and harvesting (a poetic allusion to saving and investing), contract design, organizational architecture, and risk management. Anyone who contemplates the functions and the financial institutions involved in them (commercial and investment banks; money management firms; insurance companies; rating agencies, and so on) soon realizes that a central unifying competence is asset valuation. Certainly,

[1] This is not true, however, in the work of Hyman Minsky (1986) and Jack Guttentag and Richard Herring (1984) where economic and financial instability are endogenous. Guttentag and Herring assume a behavioral bias in the supposed likelihood of credit shocks. The subjective probability of a shock wanes with the length of time that has elapsed since the last shock. With disaster myopia of this kind, default premia shrink and the capital ratios of borrowers and lenders drop off. Yet, actual probabilities are unchanged. So, the economy becomes vulnerable to financial disorder during an expansion. A major shock reduces capital, boosts the subjective probability of further shocks, and causes an abrupt and counterproductive surge in credit rationing.

the theory of value, and comparisons of price and value, is what much of finance is about.

Modern finance is the paradigm that has governed thinking in academic finance since the late 1950s. It flows from a grand vision that aims to reconstruct society with individual rational action, often measured in cash, as its centerpiece. It is, so to speak, a great-grandchild of Rene Descartes, a grandchild of the French Enlightenment and a child of neoclassical economics, above all Leon Walras.[2] Modern finance builds a theory of value based on two pillars. The first pillar is the concept of "beautiful people," defined as rational, autonomous agents characterized by expected utility maximization, risk aversion, Bayesian updating, and rational expectations. I call these agents Olympians. (This is Herbert Simon's term.) Alas, few people go to the Olympics. The second pillar is the concept of "beautiful markets," i.e., depending on the problem-at-hand, liquid, competitive, complete, perfect, rational markets.[3] Start with these two pillars and add a few auxiliary assumptions, most notably the notion of mutual adjustment of supply and demand. Eventually --the dynamics remain a matter of scientific investigation-- we get to market equilibrium. At that point, all agents reach Nirvana, the optimum. For example, investment portfolios are mean-variance efficient. Only systematic risk is priced in equilibrium. Conditional on what is known about the future, price equals value at all times. There are no opportunities left for rational arbitrage. We live in the best of all possible worlds. Remember Dr. Pangloss in Voltaire's *Candide* (1759). Or bring to mind Alexander Pope's *Essay on Man* (1734) where he says: "Order is Heaven's first law. One truth is clear. Whatever is, is right. "

What is the role of institutional factors (e.g., market organization, regulatory and tax systems, and so on) in neoclassical finance? To a first approximation, there is none. At least, no constructive role. Rational agents work around institutional frictions and

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[2] Among sociologists, the rational transformation of society is a major topic --usually associated with Max Weber and more recently with James Coleman (1993). See also Jacques Ellul (1954; 1965).

[3] For a definition and analysis of these various terms, as well as the link with the allocation, information, liquidity and risk sharing roles of the capital markets, see Tempelaar (2004). The neoclassical model disallows diversity of opinion and destabilizing speculation. There are no limits to arbitrage.

thereby render them immaterial to market outcomes. Of course, the process may take some time. Merton Miller made this type of institutional arbitrage a favorite lecture theme. He spoke about institutions as distortions but ultimately neutral mutations. Towards the end of his life, Miller's comments were often formulated in the context of regulatory barriers to financial innovation, but the link with the Miller-Modigliani theorems and the work of Ronald Coase is obvious. Robert Merton's views are similar (see, e.g., Merton and Bodie, 2005). His writings say that the basic functions of finance are the same, always and everywhere. What does change (endogenously) is the technological and regulatory environment. That is why banking in 2010 is different from banking in 1910, and why banking in Switzerland is different from banking in Egypt.[4]

How do modern finance theorists plead their case? They mostly reason in a logically deductive way starting from axioms that have *a priori* normative appeal. In other words, the theorists look deep into their own hearts. They ask: Isn't this way or that way how sensible citizens *ought to* behave? Modern finance theorists rarely ask people questions and they certainly do not run laboratory experiments. They put up with empirical data analysis, fine, but in their minds the persuasive power of data cannot match the power of logic. Years ago, my grandfather in Flanders used to joke that "*if* our family cat had been a cow, we would have had milk during the war." Much of what goes on in corporate finance (and other subfields of finance) is exactly like my grandfather's quip. The theorems are logically unassailable. Yet, it is tough to see how one could test them or make them operational. Against all that, the battle cry of neoclassical orthodoxy looks to be: "Se non e vero, e bene trovato."[5]

[4] The neoclassical model is to be distinguished from transaction cost economics. Oliver Williamson (1985) does not view the firm as a production function. He compares the costs of transacting business under alternative governance structures. Williamson assumes that economic agents are boundedly rational but are given to opportunism. Asset specificity is key dimension of transactions.

[5] For a defense of modern finance as well as the specific claim that financial markets are rational, see Mark Rubinstein (2001).

Behavioral finance

Behavioral finance uses an approach that is diametrically opposite to the one followed by modern finance. Behavioral finance does not assume rational agents or frictionless markets. It suggests that the institutional environment is vitally important. The starting point is bounded rationality. Let me quote Paul Slovic verbatim since I cannot say it as well as he did in 1972: "A full understanding of human limitations will ultimately benefit the decision-maker more than will naïve faith in the infallibility of his intellect." That economic and financial intuition are fragile may annoy mainstream economists, but it looks more plausible than the opposite point of view --namely, that investors, their financial advisors, bankers, and corporate managers know perfectly well what to do.

This brings me to a more constructive definition of behavioral finance. What is it? We are interested in the nature, quality and value of financial decision making, and we build upon insights from our sister social sciences, especially psychology and sociology. Behavioral finance is relevant to decision making in households, in markets, in firms, in financial institutions, and in government. The main research question is: What do people do and how do they do it? The research methods are mostly *inductive*, not deductive. We collect facts --based either on experiments, or questionnaires, or observation-- and we organize them into a smaller number of "superfacts." One might say, we draw maps. That activity defines theory.[6]

The psychology of financial decision-making can be explored in different ways. A quarter-century ago, most effort went into cognition. Consider, e.g., the heuristics and biases literature pioneered by Amos Tversky and Kahneman. How do people think? How do they decide? Cognitive research continues to be the dominant approach today

[6] Of course, logic and internal consistency constrain what is "true," but it does not suffice to behavioralize stylized facts in the way that mainstream economics rationalizes them. Indeed, it is irritation with unrestrained rampant rational theorizing that motivates much behavioral research. Unrestrained theorizing and disdain for data, I believe, are the chief reasons why so much of modern finance amounts to an odd collection of (i) theorems without empirical support and (ii) stylized facts without foundation in theory.

but there is interest in the study of emotion (mood; affect) and social psychology (especially herding behavior) as well.

What has been learned? The main finding is that decision processes shape decision outcomes. If you want to understand, or predict, or influence decision outcomes, always bear in mind the decision process. Numerous specific applications of this result appear in *Nudge*, a book authored by Thaler and Cass Sunstein (2008). A meaningful example has to do with organ donation. (I take the example from a 2003 paper in *Science* authored by Eric Johnson and Daniel Goldstein.) The participation rate in organ donation in the United Kingdom is perhaps 15 to 20% whereas in Belgium it is over 95%. That is a big gap and one wonders what causes it. The answer is: The decision process in combination with status-quo bias. In case of a fatal car accident in the United Kingdom, the authorities assume --unless the driver signs his license to the contrary-- that his bodily organs will *not* be donated. In Belgium, the default solution is the opposite, i.e., the driver's organs are donated. Note that in either country all it takes to modify the default is a signature. Economists, this is no secret, are impressed by the force of well-structured incentive schemes. Economists *love* incentives. So we must ask: What incentives would it take to move the U.K organ donation participation rate from 20% to 90%? In other words, what incentive scheme will achieve the same result that a minor adjustment in the decision process (i.e., changing the default) likely accomplishes effortlessly? Perhaps, this simple example informs us about the relative muscle of economics and psychology to influence decisions.

Why do we put faith in behavioral finance? Because in the end it is finance "you can believe in" (with apologies to Barack Obama). Thaler has referred to behavioral finance as open-minded finance, i.e., sufficiently unprejudiced to work with multiple research methods. First, the use of the laboratory, ideal to study decision making in a controlled environment. Experimental methods discipline theory since any reader who does not believe what is published may choose to replicate an experiment "at home," as it were. Second, the use of field studies and surveys, as well as the observation of indi-

vidual behavior (say, trading records) in a natural environment. Third, the use of aggregate market-level price and volume data.

I am convinced that this "one-two-three punch" disciplines behavioral theorizing far beyond what is customary in modern finance. It packs overwhelming force. Decision anomalies (in the laboratory), matched with anomalies in the behavior of individual agents (in a natural environment), matched with market anomalies (when social interaction allows fine-tuning) make a powerful brew. (Allow me to interject that the word "anomaly" may be out of place since it insinuates that mainstream theory is correct -- except for the anomaly.) What we often have are *falsifications* at three levels. Take investor overreaction. Certainly, experiments teach us that subjects do not update beliefs in Bayesian fashion. Second, investors, when asked, tell us that they like to buy past winner stocks but that they stay away from past losers. Regardless of what investors say, their trading records confirm the bias.[7] Third, at the market level, we find predictable reversals in share prices. The laboratory, financial behavior, and market results appear to be connected. That is what is persuasive.

What are the central insights of behavioral finance? Previously, I already mentioned the main result, pertinent to all studies of decision-making, which says that "process tells us about outcome." Specifically, behavioral finance has produced three classes of findings. The first class lists the numerous ways in which financial intuition is fragile. From excessive optimism, to overconfidence, to loss and regret aversion, to the shortcomings of attention and memory, it is a nauseatingly long list. Note that it is not alleged that financial intuition is broken, only that it *can* break. Basic investment and statistical principles are not learned from everyday experience, however. Awareness of what can go wrong and education may help. A more upbeat way to look at the findings is the realize that there is method to the madness. The errors are systematic. Various psychological mechanisms have been identified. They illuminate how the brain works.[8]

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[7] Ironically, investors are more likely to hang on to losers than to winners if the changes in value occurred while the stocks were part of their portfolio.

[8] For a strongly worded critique of the "heuristics and biases" literature or, more broadly, the idea that people-are-irrational-and-science-has-proved it, see Lola Lopes (1991).

The second class of findings has to do with investment and financial decision-making in organizations --firms, nonprofits, financial intermediaries and so on. Here too, the study of fiascoes is informative since it guides us to decision process variables that are critical. Every day we learn more about committee (e.g., board) decision-making, the role of top managers in the creation of corporate wealth, and the pro's and con's of formalities and red tape. As president of the American Finance Association, Michael Jensen asked that we break open the black box called the firm. Behavioral finance is contributing to that effort.

The third class of findings relates to the speculative dynamics of asset prices in world financial markets. Here, the main behavioral insight is that the errors of unsophisticated investors ("noise traders") create profit opportunities for experts even if noise traders create a great deal of risk at the same time (De Bondt, 2005). Investor sentiment, euphoria and hysteria, matter. Widely-shared self-reinforcing misconceptions cause transient price bubbles, large and small. Without a doubt, rational arbitrage matters also but, considering how short most people's investment horizons are, it does not carry the day. Investors should not fret about the power of arbitrage any more, I believe, than surfers should worry that on average the sea is flat. One way to condense the wide-ranging empirical evidence is with a quotation from Thomas Jefferson, the third President of the United States: "In matters of style, swim with the current. In matters of principle, stand like a rock." Into these short sentences, one can read the profitability of both momentum and contrarian investing.

Strengths

What are the strengths of behavioral finance? There are four. First, if you look through the academic literature of the last twenty years, you will find that behavioral finance has been productive. My guess is that maybe half of all "new" facts in asset pricing and corporate finance were brought to the forefront by behavioral theories. Also, it offers a framework to arrange theoretical hypotheses and empirical results. (Incidentally, the efficient market hypothesis deserves the same compliment.)

Second, I repeat, behavioral finance is pragmatic. The aim is to help people. In that sense, the behavioral approach suits the professional business school, and it supports the rising demand for financial planning advice.

Third, behavioral finance potentially brings discipline to social science research. Discipline fundamentally implies triangulation, i.e., the synthesis of data from multiple sources. "Finance you can believe in" requires more than mathematical proof. Few obsessions in academic finance irk me more than the crazed desire to build toy models, to play with MATLAB or C++, *and to label it science*. How many capable electrical and mechanical engineers, in pursuit of a finance Ph.D., did society lose this way?

The final strength of behavioral finance is simply that it is a stimulating field of scholarship. People and money: What can fascinate more? One way to sum up the appeal of behavioral finance is to say that it is science --like the Black-Scholes option pricing formula is science-- but that, in addition, it is *social* science.

Weaknesses

What are the weaknesses of behavioral finance? As I said, behavioral finance is now contested terrain, and no single person or group controls the brand image. So, I feel less restraint than I used to in expressing my personal views. What are my criticisms? I discuss three. Together, I also sketch some future research directions.

My first complaint is that, just like careful study of the eternal functions of finance, say payments and settlements, cannot tell us much about the practical organization of the payment system (cash vs. credit cards vs. checks, etc.), in the same way, undivided focus on psychological mechanisms (e.g., impulses and predispositions, psychophysics and brain physiology) does not allow an adequate interpretation of economic and financial events. Man is much more than a biological organism; he is also a person, i.e., a social-historical creation. The brain is individual but the mind is collective. Reality is socially constructed. Philosophers and organization theorists often compare man's conduct to that of a stage actor. People enact roles. Their motives, outlook and self-image are significantly shaped by what is expected from them in society. Hence,

research in behavioral finance should examine the tangible content of people's thought processes.[9]

It is difficult to interpret human action without knowing first how people think about a problem. A extravagant illustration, far removed from finance, has to do with the September 2001 attacks in New York. The questions that I would ask in relation to these evil acts are as follows: How did the perpetrators comprehend the world, and how did they understand their self-interest so that they wanted to be suicide-pilots?[10] Evidently, this issue cannot be resolved without reference to social, cultural and historical factors. I am not revealing any secrets. Four centuries ago, Blaise Pascal said that "there are truths on this side of the Pyrenees which are falsehoods on the other." [11] In the same way, in financial decisions, objectives and perceived constraints can differ radically. We need to look more into the content, structure and style of intuitive economic stories. For example, how do Swiss citizens (who in majority rent) think about home ownership, and how do Americans? Why have Americans for so long believed that real estate is a safe investment? In general, what sorts of economic arguments, true or false, persuade investors and motivate action? Shiller (1990) has done some engaging work in this area but, on the whole, behavioral finance has had little to say.

Second, behavioral finance has to move beyond a narrow, solely economic interpretation of what defines "mistakes." Take, e.g., adventurism. U.S. data suggest that investors, entrepreneurs and top managers tend towards unrealistic optimism –a sup-

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[9] I see no reason to think that a baby born today is in any meaningful way biologically different from a baby born at the time of Plato. Evolution is slow, so the "hardware" (nature) is unchanged. But certainly the "software" that parents, educators, and television pump into the baby (nurture) is radically different from what it was 2,500 years ago. This is what accounts for most variation in behavior. Jean Piaget said that "ce n'est pas pour rien que l'enfance est bien plus longue chez l'homme qu'en des especes animales inferieures."

[10] Note that the assertion that "the terrorists were REMMs" (i.e., resourceful evaluating maximizing men – the brainchild of Michael Jensen and William Meckling, 1994) explains almost nothing. Based on what happened that day, one may conclude that the terrorists "succeeded" and that it is likely that they "tried their best." But this observation seems entirely beside the point.

[11] Likewise, recent research on culture and point of view, summarized by Richard Nisbett and Takohiko Masuda (2003), suggests that Asians and Westerners "differ in their cognitive and perceptual habits along the lines of the holistic vs. analytic stance characteristic of ancient Chinese vs. ancient Greek science and philosophy" (p. 11164).

posed cognitive bias with perilous consequences. But, one may ask, what causes optimism? Is it context-specific? Does it stem from past personal success? Or is it an incontestable part of the American character? Error, economists say, is strictly about the contrast between actions that are taken and actions that sensibly should be taken in reference to costs and benefits. Economists' chief concern is efficiency. The concept of error is elastic, however. James March (1994) draws a distinction between the economic "logic of consequences" and the more broadly applicable "logic of appropriateness." Consider for instance someone who breaks the rules of etiquette. His norm violations may be embarrassing, perhaps inexcusable, but they may be innocent from the viewpoint of efficiency. Nonetheless, social norm violations often matter a great deal. Besides efficiency, equity, justice, sustainable development and so on are legitimate criteria of social and economic organization with full normative status (see, e.g., Arthur Okun, 1975). These criteria may be protected values in the sense that some people categorically reject all trade-offs for money.

Values and beliefs vary over time. With *Silent Spring* (1962) Rachel Carson called into question the paradigm of scientific progress. Today, one can scarcely find a social issue considered more worrisome than harm to nature or the human body caused by modern technology. This worldview accounts for a remarkable change in risk perceptions and attitudes even though, compared to a century ago, people have longer and more productive lives (Dake, 1992). Also, voters in continental Europe traditionally support social democracy and big government. In this regard, U.S. history is more complex. Since Ronald Reagan, U.S. policy-makers have reformed the state. Little by little, they have privatized employment, health, and pension risks. The retrenchment produced the so-called ownership society with the small autonomous investor, managing his 401-k, as a central cultural figure. Today, we live in "financial times" and, indeed, we are captivated by Maria Bartiromo, we pore over Forbes' annual list of billionaires, and (after the fall of the maestro, Alan Greenspan) lean on Warren Buffett as the next prophet of global capitalism. Yet, the longstanding expectation of across-the-board rises in the standard of living has been lost. There is much middle-class anxiety.

I conclude that the workings and organization of financial systems, here and elsewhere, must be understood within a broad context that includes the evolution of ideas and the formulation of economic policy. This context circumscribes the day-to-day opportunities and risks that investors confront. Importantly, it also defines a macro-level research agenda for behavioral finance. Take, for example, financial regulations intended to protect the small investor. While new laws may soon be on the books in the U.S., securities laws enacted previously already aim to protect ill-informed and unsophisticated investors. Their success or failure varies as the pendulum of public opinion on what is needed swings back and forth.[12]

Finally, there is a stunning disconnect between the rhetoric of irrationality in behavioral research and the reality that in many corners of the globe people lead a pretty good life. The vulnerabilities exist –no question about it—but they do not paint a full picture. A profound question of social science is: Why are we collectively so strong, yet as individuals so weak? When does societal rationality transcend individual rationality? Orthodox economic theory places the pinnacle of rationality in the brains of individual people whose self-interest drives market prices.[13] It blames social evils on dysfunctional incentives and disarray, mainly in corporate bureaucracies and government. (Skim, e.g., the *Journal of Law and Economics* or the musings of Michael Jensen.) The truth, I think, is nearly the opposite. Rationality and well-being derive from organization, spontaneous or deliberate. Henri Frédéric Amiel, the 19th century Geneva philosopher, says it well: "L'experience de chaque homme se recommence. Seules les institutions deviennent plus sages" (1882).

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[12] A major aspect of the current regulatory debate (or any political debate) is to allow policy-makers to respond to a crisis, to show leadership, and to arouse their supporters. See, e.g., Murray Edelman (1988). If policy discussions are theatrical spectacles, as Edelman says, then the findings of micro-level behavioral research may matter less than we think. For example, "full disclosure of information" --a favorite go-to solution after a financial scandal breaks-- *by itself* does not fully protect unsophisticated investors. (Not everyone in society is distrustful, and not everyone can dissect a dense disclosure document.) Yet, on philosophical grounds, many judge those shortcomings insufficient to justify stricter regulation.

[13] Austrian, institutional and evolutionary economics do not. See, e.g., the works of Friedrich von Hayek (1948) or Richard Nelson (1981). These authors espouse the private enterprise system but call attention to the fact that its assumed virtues (innovativeness, responsiveness, administrative parsimony) have no basis in microeconomic theory.

Why are institutions so crucially important? The main reason is that nowadays everyone in society depends on everyone else. We sell 99% of what we produce, we buy 99% of what we consume, and we lead better lives for it. Incessant scientific and technological progress, product and service standardization, and economic organization are key. The secret is encapsulated by the motto of the 1933 Chicago World's Fair: "Science finds, industry applies, man conforms." Technological artifacts make us smart for several reasons.[14] (1) Technology greatly extends man's cognitive capabilities. Because I forget, I use a notepad, I visit the library, or I access the internet. (2) Technology is often coupled with labor specialization. In that way, it allows collective action. Experts make decisions (e.g., in relation to the nation's supply of electricity) that tens of thousands are incapable to make for themselves. (3) Technology embodies knowledge. I only have a vague understanding of know how my wristwatch works. Luckily, in this case and a thousand more, I do not need to know. It is enough that I be able to read the time.[15] (4) Lastly, technological artifacts often allow for cheap and limitless replication. So, good products or ideas spread quickly across the globe.

Man and machine have to work together, however. Technology can be easy or difficult to use. Similarly, administrative organization can be effective or ineffective. (Remember the principle: "A place for everything, and everything in its place.") Smart technology and organization are human-centered. In the short run, this is a matter of intentional design, i.e., of pragmatic behavioral research. Over longer periods, it is the outcome of a process of trial and error. To ask about the "logic" of American corporate law or a computer keyboard is a bit like asking about the "design" of the French language, to what purpose and under which specifications.

That in modern society the balance between individual and institutional forces has shifted as much as it has disturbs many (see, e.g., Nisbet, 1968; Ellul, 1965). We lament that man must conform, that personal freedom is lost when either law regulates what we do or large corporations (e.g., because of cost considerations or network exter-

[14] See, e.g., Donald Norman (1994).

[15] Occasionally, society forgets why some systems or technologies were designed the way they were, and this is costly. Recall, e.g., the Y2K problem.

nalities) control our choice options. Yet, man is limited by his brainpower, habits, and conception of purpose. Organization produces predictability. This is fundamental. Rules and regulations coordinate society while reducing the individual need to think (Heiner, 1983). No economist I know, no matter how conservative, opposes traffic lights. All ostensibly agree that traffic lights synchronize traffic quite well even if, at 4:00 am, they are rationally tempted to run a red light.

Of course, financial technology is often customer-friendly and performs brilliantly. Take, e.g., electronic banking or the ATM-machine. Still, mutual funds can improve the layout of their monthly statements. Retirement saving plans and asset allocation tools can be made better. The U.S. mortgage debt crisis that started in 2007 is a gigantic drama from which the financial industry and regulators may learn.

In every instance, the solution of these problems begins with an admission that people are human and that cognition is not free. What is required is "financial ergonomics," a discipline that engineers financial products and services according to human needs and that optimizes well-being and overall system performance. Behavioral finance holds the potential to create much value for society but it also has a great deal of work to do.

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