

THE GORDON GEKKO EFFECT: THE ROLE OF CULTURE IN THE FINANCIAL INDUSTRY

1. INTRODUCTION

In the 1987 Oliver Stone film *Wall Street*, Michael Douglas delivered an Oscar-winning performance as financial “Master of the Universe” Gordon Gekko. An unabashedly greedy corporate raider, Gekko delivered a famous, frequently quoted monologue in which he described the culture that has since become a caricature of the financial industry:

The point is, ladies and gentleman, that greed, for lack of a better word, is good. Greed is right, greed works. Greed clarifies, cuts through, and captures the essence of the evolutionary spirit. Greed, in all of its forms, greed for life, for money, for love, knowledge, has marked the upward surge of mankind. And greed, you mark my words, will not only save Teldar Paper, but that other malfunctioning corporation called the USA.

Despite the notoriety of this encomium to enlightened self-interest, few people know that these words are based on an actual commencement speech delivered in 1986 at

what is now the Haas School of Business of the University of California at Berkeley. The speaker? Ivan Boesky, who would be convicted just eighteen months later in an insider trading scandal.¹

Millions of people saw *Wall Street*, and Gekko’s monologue became part of popular culture. Hundreds, perhaps thousands, of young people were inspired to go into finance as a result of Douglas’s performance. This dismayed Stanley Weiser, the co-writer of the screenplay, who met many of these young people for himself. As Weiser wrote in 2008 at the height of the financial crisis, “A typical example would be a business executive or a younger studio development person spouting something that goes like this: ‘The movie changed my life. Once I saw it I knew that I wanted to get into such and such business. I wanted to be like Gordon Gekko.’ . . . After so many encounters with Gekko

¹ Bob Greene, “A \$100 Million Idea: Use Greed for Good,” *Chicago Tribune*, December 15, 1986; James Sterngold, “Boesky Sentenced to 3 Years in Jail in Insider Scandal,” *New York Times*, December 19, 1987.

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https://www.newyorkfed.org/research/author_disclosure/ad_epr_2016_gordon-gekkko-effect_lo.html

admirers or wannabes, I wish I could go back and rewrite the greed line to this: ‘Greed is good. But I’ve never seen a Brinks truck pull up to a cemetery.’”²

What makes this phenomenon truly astonishing is that Gekko is not the hero of *Wall Street*—he is, in fact, the villain. Moreover, Gekko fails in his villainous plot, thanks to his young protégé-turned-hero, Bud Fox. The man whose words Weiser put into Gekko’s mouth, Ivan Boesky, later served several years in a federal penitentiary for his wrongdoings. Nevertheless, many young people decided to base their career choices on the screen depiction of a fictional villain whose most famous lines were taken from the words of a convict. Culture matters.

This is a prime example of what I propose to call “the Gekko effect.” It is known that some cultural values are positively correlated to better economic outcomes, perhaps through the channel of mutual trust.³ Firms with stronger corporate cultures, as self-reported in surveys, appear to perform better than those with weaker cultures, through the channel of behavioral consistency, although this effect is diminished in a volatile environment (Gordon and DiTomaso 1992; Sørensen 2002). However, not all strong values are positive ones. The Gekko effect highlights the fact that some corporate cultures may transmit negative values to their members in ways that make financial malfeasance significantly more probable. To understand these channels and formulate remedies, we have to start by asking what culture is, how it emerges, and how it is shaped and transmitted over time and across individuals and institutions.

2. WHAT IS CULTURE?

What do we mean when we talk about corporate culture? There are, quite literally, hundreds of definitions of culture. In 1952, the anthropologists A.L. Kroeber and Clyde Kluckhohn listed 164 definitions that had been used in the field up to that time, and to this day we still do not have a singular definition of culture. This article does not propose to solve that problem but merely to find a working definition to describe a phenomenon. Kroeber and Kluckhohn settled on the following: “Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts” (Kroeber and Kluckhohn 1952, 35). Embedded in this seemingly straightforward and intuitive

² Stanley Weiser, “Repeat after Me: Greed Is Not Good,” *Los Angeles Times*, October 5, 2008.

³ For example, see Guiso, Sapienza, and Zingales (2006).

definition is an important assumption that we shall revisit and challenge below—that culture is transmitted rather than innate—but that we will adopt temporarily for the sake of exposition and argument.

A corporate culture exists as a subset of a larger culture, with variations found specifically in that corporate entity. Again, there are multiple definitions. The organizational theorists O’Reilly and Chatman define corporate culture as “a system of shared values that define what is important, and norms that define appropriate attitudes and behaviors for organizational members” (O’Reilly and Chatman 1996, 166), while Schein defines it in his classic text as “a pattern of shared basic assumptions that was learned by a group . . . that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to [the group’s] problems” (Schein 2004, 17).

The key point here is that the distinctive assumptions and values of a corporate or organizational culture define the group. These assumptions and values will be shared within the culture, and they will be taught to newcomers to the culture as the correct norms of behavior. People who lack these values and norms will not be members of the shared culture, even though they may occupy the appropriate position on the organizational chart. In fact, these outsiders may even be viewed as hostile to the values of the culture, a point to which we will return.

It is clear from these definitions that corporate culture propagates itself less like an economic phenomenon—with individuals attempting to maximize some quantity through their behavior—and more like a biological phenomenon, such as the spread of an epidemic through a population. Gordon Gekko, then, can be considered the “patient zero” of an epidemic of shared values (most of which are considered repugnant by the larger society, including Gekko’s creator).

This biologically inspired model of corporate culture can be generalized further. Three factors will affect the transmission of a corporate culture through a group: the group’s leadership, analogous to the primary source of an infection; the group’s composition, analogous to a population at risk; and the group’s environment, which shapes its response. The next sections will explore how the transmission of values conducive to corporate failure might occur, how such values emerge, and what can be done to change them.

3. VALUES FROM THE TOP DOWN: AUTHORITY AND LEADERSHIP

Who maintains the values of a corporate culture? Economics tells us that individuals respond to incentives—monetary rewards and penalties. From this mercenary perspective, corporate culture is almost irrelevant to the financial realities of risk and expected return.

However, the other social sciences offer a different perspective. A corporate culture directs its employees through authority—sometimes called “leadership” in the corporate world—as much as through financial incentives, if not more so. The great German sociologist Max Weber broke down authority into three ideal types: the charismatic, who maintains legitimacy through force of personality; the traditional, who maintains legitimacy through established custom; and the legal-rational, whose legitimacy comes from shared agreement in the law (Kronman 1983, 43-50). We can see that Gordon Gekko is almost a pure example of Weber’s charismatic authority; however, at this point in our discussion, the style of authority is less important than the fact of authority.

According to Herbert A. Simon’s classic analysis of administrative behavior, a person in authority establishes the proper conduct for subordinates through positive and negative social sanctions (Simon 1997, 184-5). These sanctions, in the form of social approval or disapproval, praise or embarrassment, may be the most important factor in inducing the acceptance of authority. Also important is the sense of shared purpose, which, in the military, is sometimes called *esprit de corps*. People with a sense of purpose are more likely to subordinate themselves to authority, in the belief that their subordination will aid in achieving the goals of the group.

How much economic incentive is needed for an authority figure to influence the members of a culture into bad behaviors? Experimental social psychology gives us a rather disturbing answer. In the infamous Milgram experiment, originally conducted by the psychologist Stanley Milgram at Yale University in 1961, volunteers administered what they believed were high-voltage electric shocks to a human experimental subject, simply because a temporary authority figure made verbal suggestions to continue (Milgram 1963). Of these scripted suggestions, “You have no other choice, you must go on,” was the most forceful. If a volunteer still refused after this suggestion was given, the experiment was stopped. Ultimately, twenty-six out of forty people administered what they believed was a dangerous, perhaps fatal, 450-volt shock to a fellow human being, even though all expressed doubts verbally and many exhibited obvious physiological manifestations of stress; three even experienced what appeared to be seizures. One businessman

volunteer “was reduced to a twitching, stuttering wreck, who was rapidly approaching a point of nervous collapse . . . yet he continued to respond to every word of the experimenter, and obeyed to the end.” Milgram’s volunteers were paid four dollars plus carfare, worth about fifty dollars today.

Even more notorious is the Stanford prison experiment, conducted by the Stanford University psychologist Philip Zimbardo in 1971. In the two-week experiment conducted in the basement of the Stanford psychology department, Zimbardo randomly assigned volunteers to the roles of guards and prisoners (Haney, Banks, and Zimbardo 1973a, b). Almost immediately after the experiment began, the “guards” started to behave in a dehumanizing way toward the “prisoners,” subjecting them to verbal harassment, forced exercise, manipulation of sleeping conditions, manipulation of bathroom privileges (some of it physically filthy), and the use of nudity to humiliate the “prisoners.” Zimbardo, who played the role of prison superin-

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tendent, terminated the experiment after only six days, at the urging of his future wife, Christina Maslach, whom he had brought in as an outsider to conduct interviews with the subjects.⁴ Zimbardo paid his subjects fifteen dollars a day, roughly ninety dollars per diem in today’s dollars.

It should be obvious that monetary incentives are a completely insufficient explanation for the behavior of the volunteers in these two experiments. In Milgram’s experiment, the majority of subjects submitted themselves to the verbal demands of an authority despite the severe mental stress inflicted by these tasks. In Zimbardo’s experiment, volunteers threw themselves into the role of guards with gusto, with Zimbardo himself playing the role of the superintendent willing to overlook systemic abuses. In each case, the volunteers fulfilled the roles that they believed were expected of them by the authority.

Leadership is important in harnessing the behavior of a corporation’s employees to become more productive and competitive. Unfortunately, as Milgram and Zimbardo demonstrated, the same factors that allow leadership to

⁴ Additional details from the Stanford Prison Experiment are available at <http://www.prisonexp.org>.

manifest itself through performance and teamwork also allow it to promote goals that lack a moral, ethical, legal, profitable, or even rational basis. Remember that the 65 percent of Milgram's experimental subjects who continued to administer electric shocks were compelled to do so merely by verbal expressions of disapproval by the authority figure.

In corporate cultures that lack the capacity to assimilate an outside opinion, the primary check on behavior is the authority. From within a corporate culture, an authority may see his or her role as similar to that of the conductor of an orchestra, managing a group of highly trained professionals in pursuit of a lofty goal. From a viewpoint outside the culture, however, the authority may be cultivating the moral equivalent of a

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gang of brutes, as Zimbardo himself did in his role as mock prison superintendent. It took a trusted outsider to see the Stanford prison experiment with clear eyes and to convince Zimbardo that his experiment was, in fact, an unethical degradation of his test subjects.

Finally, even if the authority has an excellent track record, a subtle form of moral hazard is associated with this excellence, as has been pointed out by Robert Shiller: If "people have learned that when experts tell them something is all right, it probably is, even if it does not seem so . . . thus the results of Milgram's experiment can also be interpreted as springing from people's past learning about the reliability of authorities" (Shiller 2005, 159).

4. VALUES FROM THE BOTTOM UP: COMPOSITION

Not all of corporate culture is created from the top down. A culture is also composed of the behavior of the people within it, from the bottom up. Corporate culture is subject to compositional effects, based on the values and behaviors of the people the organization hires, even as corporate authority attempts to inculcate its preferred values and behaviors into employees.

The pool of possible corporate employees today is wide and diverse. Firms and industries draw from this pool with a particular employee profile in mind, often filtering out other qualified candidates. However, this filter may shape the corporate culture in unexpected ways. In the late 1990s, the anthropologist Karen Ho conducted an ethnographic survey of Wall Street investment banks. Beginning in the 1980s, the era of Oliver Stone's *Wall Street*, these firms deliberately targeted recent graduates of elite schools, in particular Harvard and Princeton, appealing to their intellectual vanity: "the best and the brightest." These fresh recruits brought their social norms and values with them to Wall Street (Ho 2009, 39-66). As they were promoted, and older members departed, a new norm of behavior developed within investment bank culture through population change. Knowledge of the older Wall Street culture faded and became secondhand, while *Liar's Poker*, Michael Lewis's memoir about graduating from Princeton and going to work at Salomon Brothers, became a manifesto for the new elite (Ho 2009, 337). Even the drawbacks of a Wall Street job could confirm the values of an elite worldview. Ho found that her informants rationalized Wall Street job insecurity as normative, since the insecurity revealed "who is flexible and who can accept change" (Ho 2009, 274). The historically high levels of Wall Street compensation were, in her informants' view, the natural reward for members of the elite assuming the personal risk of losing their jobs.

Corporations deliberately choose employees with attributes that corporate leadership believes are useful to the organization. To borrow another biological metaphor, the hiring process is a form of artificial selection from a population with a great deal of variation in personality type, worldview, and other individual traits. All else being equal, employees with traits that more closely fit the corporate culture will do better in the corporation since they are already adapted to that particular environment. This leads to a feedback loop reinforcing the corporate culture's values. Employees who do not fit this profile find themselves under social pressure to adapt or leave the organization. This process of selection and adaptation leads to stronger corporate cultures, which are correlated with stronger performance. However, there are times when a corporation benefits from a diversity of viewpoints to prevent groupthink (Janis 1982). The innovator, the whistleblower, the contrarian, and the devil's advocate all have necessary roles in the modern corporation, especially in a shifting economic environment. A human resources manager, then, faces much the same dilemma as a portfolio manager—how to pick winners, shed losers, and manage risk so as to increase the value of the overall portfolio.

Many corporations deliberately hire “self-starters” or “go-getters,” people with aggressive or risk-taking personalities who are thought to have a competitive nature and whose presence (so goes the belief) will lead to higher profits for the firm. This personality type is drawn to what the sociologist Stephen Lyng has described as “edgework” (Lyng 1990). Borrowing the term from the writings of gonzo journalist Hunter S. Thompson, Lyng uses it to describe the pleasurable form of voluntary risk taking sometimes found in adventure sports such as skydiving or in hazardous occupations such as test piloting. In these fields, the individual is put at severe risk, but the risk is made pleasurable through a sense of satisfaction in one’s superior ability to navigate such dangerous waters. This dynamic naturally extends to the financial industry, and, in fact, sociologist Charles W. Smith recently used the concept of edgework to compare the financial market trader to the sea kayaker (Smith 2005).

Edgeworkers normally think of themselves as ferociously independent. Nevertheless, Lyng has found that success in the face of risk reinforces among edgeworkers a sense of group solidarity and belonging to an elite culture, even across professions. But this sense of solidarity extends only to fellow edgeworkers, which puts these individuals at odds with the larger culture. In a corporation, this can lead to a split between a trading desk, or even upper management, and the rest of the corporate culture. For example, the organizational theorist Zur Shapira conducted surveys of fifty American and Israeli executives and found that, even though many urged their subordinates to maintain risk-averse behavior, they themselves took greater risks, deriving active enjoyment in succeeding in the face of those risks. One company president still viewed himself as an edgeworker, telling Shapira, “Satisfaction from success is directly related to the degree of risk taken” (Shapira 1995, 58). For a new hire who patterns his or her job behavior on an authority figure within the firm, this may be a case of “Do as I say, not as I do.”

Group composition may lead to differences that cannot be explained by culture alone. An individual’s temperament and personality are largely internal in origin and difficult to change. Some traits, such as the propensity for risk taking, may have deeper causes. For example, it has long been documented that younger men are more prone to engage in dangerous activities than older men or women of the same age, with behaviors ranging from reckless driving to homicide (Wilson and Daly 1985). There may be a neuroscientific reason for this difference in the development of the adolescent brain.⁵ These differences are by definition not cultural: They can neither be learned nor transmitted symbolically. Yet these differences affect the highest levels of human behavior.

⁵ For example, see Steinberg (2008).

Nevertheless, culture is still powerful, even in the face of intrinsic behavioral variation. To take the most dramatic example, consider risk-taking behavior, which has known physiological and neurological correlates. Insurance companies use automobile fatalities as a proxy to measure risk-taking behavior among groups. However, there has been an absolute decline in automobile fatalities in the United States over the last forty years, despite a vast increase in the number of drivers and miles traveled. This decline was caused by changes in culture: in material culture, such as advances in the design of automobiles and highways; in regulatory culture, such as the enforcement of appropriate speed limits; and in social culture, such as the stigmatization of driving under the influence of alcohol. The same propensity for risk is as present today as it was in 1975, but the culture at large has changed to limit its negative effects on the highway.

5. VALUES FROM THE ENVIRONMENT: RISK AND REGULATION

The third factor influencing corporate culture is the environment. Competition, the economic climate, regulatory requirements—the list of possible environmental factors that affect corporate culture may seem bewilderingly complex. However, anthropologist Mary Douglas made the elegant observation that a culture’s values are reflected in how it manages risk, which, in turn, reflects how the culture perceives its environment (Douglas and Wildavsky 1982). No culture has the resources to eliminate all risk; therefore, a culture ranks its dangers according to what it finds most important, both positively and negatively. This prioritization

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acts as a snapshot of the culture’s operating environment, just as an insurance portfolio might act as a snapshot of the policyholder’s day-to-day environment. It is important to note that a culture’s ranking of danger may have little to do with the mathematical probability of an event. As a modern example, Douglas looked at the expansion of legal liability in the United States and its role in the insurance crisis of the 1970s. The underlying probability of medical

malpractice or illness from toxic waste changed very little over that decade. In Douglas's analysis, what changed was how society chose to respond to those dangers, owing to a change in cultural values.

Cultures warn against some dangers but downplay others in order to reinforce internal cultural values. For example, sociologist Sudhir Venkatesh finds that in "Maquis Park," his pseudonym for a poor African-American neighborhood in Chicago, it is a risk-taking behavior to leave the established network of formal and informal business relationships that define the community and experience the impossible-to-measure Knightian uncertainty of establishing new connections with few resources in the hostile environment of greater Chicago (Venkatesh 2006, 148-50). Despite the neighborhood's high crime rate, the culture of Maquis Park is risk-averse. Criminal behavior there is often an application of economic rationalism and cost-benefit analysis in the face of limited options, rather than an expression of a higher tendency to take risks.

Douglas's idea that the values of a culture are reflected in how it prioritizes risk has immediate application in understanding differences in corporate behavior. For example, compare risk taking in the insurance industry with that of

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the banking industry. The insurance industry is culturally more conservative precisely because a significant portion of insurers' revenue is determined by state regulation. As a result, insurers make money by protecting their downside—in other words, by carefully managing risk. In the banking industry, however, revenue is variable and, in many cases, directly related to bank size and leverage; therefore, risk taking is much more flexible and encouraged.

According to Douglas, modern cultures fall into three ideal types: the hierarchical—including the bureaucratic tendencies not only of government but also of the large corporation; the individualistic—the world of the market, the entrepreneur, and classic utility theory; and the sectarian—the world of the outsider, the interest group, and the religious sect. These cultures interact with one another in predictable ways. The United States is obviously multicultural, but its central institutions are largely hierarchical or individualistic, while its

population is largely sectarian. Each type of culture has a distinctive response to danger—a re-emphasis of the importance of the hierarchy, the individual, or the sect—which it uses to reinforce the values of the culture, often at the expense of competing views. Thus, for individualistic cultures, as the late German sociologist Ulrich Beck said, "community is dissolved in the acid bath of competition" (Beck 1992, 94).

This cultural defense mechanism has important implications, not only for managers but also for regulators. To borrow Douglas's distinction, the central cultures of the financial world find it very easy to ignore voices from the border, whether they are radicalized protestors in the streets, regulators from a government agency, or a dissenting opinion from within the financial community. Regulators are not immune to this defense mechanism, whether they are federal agencies, professional standards organizations, or law enforcement. In fact, the sanctions taken against a whistleblower in a regulatory organization may be much harsher than those taken against a corporate whistleblower because the regulatory whistleblower diminishes the regulator's legitimacy, the source of its legal-rational authority over others.

A corporate culture may defend itself so strongly that, despite almost everyone's dissatisfaction with the status quo, the organization may find itself unable to change its norms of behavior. This statement is not an exaggeration. In the 1990s, the organizational theorist John Weeks conducted an ethnographic survey of a large British bank, "British Armstrong," in which he found precisely this pattern of behavior (Weeks 2004). Prevailing corporate cultural values in "BritArm" were used to diminish or discount criticism. For example, BritArm prided itself on its discretion, which meant that complaints had to be made obliquely, and these complaints were therefore easily ignored. However, employees who made blunt or outspoken criticisms were viewed as outsiders who lacked BritArm's cultural values, and their complaints were also ignored as part of the culture's immune response. An acceptable level of complaint, in fact, became a new norm among BritArm's employees, part of their corporate cultural identity. As Weeks explains, "Complaining about a culture in the culturally acceptable ways should not be seen as an act of opposition to that culture. Rather, it is a cultural form that . . . has the effect of enacting the very culture that it ostensibly criticizes" (Weeks 2004, 12).

Culture is also subject to the social trends and undercurrents in the environment, creating a unique and palpable set of ideals, customs, and values that broadly influence societal behavior. From a sociological perspective, we might call these instances the "collective consciousness" of society, a term first proposed by the late nineteenth-century French sociologist

Émile Durkheim (Durkheim 1893). Twentieth-century examples might include the giddy dynamism of the Roaring Twenties, the flirtation with Marxism and socialism in midcentury, and the countercultural movement of the 1960s. From an economic perspective, examples might include recessions, depressions, hyperinflation, and asset bubbles—periods when macroeconomic factors overwhelm industry- or institution-specific factors in determining behavior throughout the economy.

During such periods, it is easy to see how entrepreneurs, investors, corporate executives, and regulators are all shaped by the cultural milieu. In good times, greed is indeed good

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and regulation seems unnecessary or counterproductive; in bad times, especially in the aftermath of a financial crisis, greed is the root of all evil and regulation must be strengthened to combat such evil.

6. VALUES FROM ECONOMISTS: RESPONDING TO INCENTIVES

Economists have traditionally looked at theories of cultural values with skepticism, whether such theories have come from psychology, anthropology, ethnography, sociology, or management science. Part of this skepticism stems from the culture of economics, which prizes the narrative of rational economic self-interest above all else. Given two competing explanations for a particular market anomaly, a behavioral theory and a rational expectations model, the vast majority of economists will choose the latter—even if rationality requires unrealistically complex inferences about everyone's preferences, information, and expectations. The mathematical elegance of a rational expectations equilibrium usually trumps the messy and imprecise narrative of corporate culture. For example, Schein breaks down an organizational culture into its observable artifacts, espoused values, and unspoken assumptions (Schein 2004, 26). In

the pure economist's view, this is much too touchy-feely. An economist will measure observables but look askance at self-reported values and ignore unspoken assumptions in favor of revealed preferences. Gordon Gekko's motivation—and his appeal to moviegoers—is simple: wealth and power. He is *Homo economicus*—the financial equivalent of John Galt in Ayn Rand's *Atlas Shrugged*—optimizing his expected utility, subject to constraints. From the economist's perspective, Gekko's only fault is optimizing with fewer constraints than those imposed by the legal system.

However, the economist's view of rational self-interest is not simply axiomatic: Economic self-interest is a learned and symbolically transmitted behavior. We do not expect children or the mentally impaired to pursue their rational self-interest, nor do we expect the financially misinformed to be able to maximize their self-interest correctly. Therefore, this view of economic behavior fulfills the textbook definition of a cultural trait, albeit one that economists believe is universal and all-encompassing, as the term *Homo economicus* suggests.

Through the cultural lens of an economist, individuals are good if they have an incentive to be good. The same motivation of self-interest that drives a manager to excel at measurable tasks in the Wall Street bonus culture may also induce the manager to shirk the less observable components of job performance, such as following ethical guidelines (Bénabou and Tirole 2015). Yet, the same manager might behave impeccably under different circumstances—in other words, when faced with different incentives.

There are a few notable exceptions to this cultural bias against culture in economics. Hermalin (2001) presents an excellent overview of economic models of corporate culture, citing the work of several researchers who have modeled culture as

1. game-theoretic interactions involving incomplete contracts, coordination, reputation, unforeseen contingencies, and multiple equilibria (Kreps 1990);
2. a store of common knowledge that provides efficiencies in communication within the firm (Crémer 1993);
3. an evolutionary process in which preferences are genetically transmitted to descendants and shaped by senior management, like horse breeders seeking to produce championship thoroughbreds (Lazear 1995);
4. and the impact of situations on agents' perceptions and preferences (Hodgson 1996).

Despite these early efforts, and Hermalin's compelling illustrations of the potential intellectual gains from trade between economics and culture, the study of culture by economists is still the exception rather than the rule. One reason is that the notion of rational self-interest, and its rich quantitative implications for behavior, has made economics the most analytically powerful of the social sciences. The assumption that individuals respond to incentives according to their self-interest leads to concrete predictions about behavior, rendering other cultural explanations unnecessary. In this framework, phenomena such as tournament salaries and Wall Street bonuses are a natural and efficient way to increase a firm's productivity, especially in a high-risk/high-reward industry in which it is nearly impossible to infer performance differences between individuals in advance.⁶ If a corporate culture appears "greedy" to the outside world, it is because the world does not understand the economic environment in which the culture operates. The economist's view of culture—reducing differences in behavior to different structures of incentives—can even be made to fit group phenomena that do not appear guided by rational self-interest, such as self-deception, over-optimism, willful blindness, and other forms of groupthink (Bénabou 2013). Greed is not only good, it is efficient and predictive. Therefore, individual misbehavior and corporate malfeasance are simply incentive problems that can be corrected by an intelligently designed system of financial rewards and punishments.

This description is, of course, a caricature of the economist's perspective, but it is no exaggeration that the first line of inquiry in any economic analysis of misbehavior is to investigate incentives. A case in point is the rise in mortgage defaults by U.S. homeowners during the financial crisis of 2007-2009. Debt default has been a common occurrence since the beginning of debt markets, but after the peak of the U.S. housing market in 2006, a growing number of homeowners engaged in *strategic defaults*—defaults driven by rational economic considerations rather than the inability to pay. The rationale is simple. As housing prices decline, a homeowner's equity declines in lockstep. When a homeowner's equity becomes negative, there is a much larger economic incentive to default, irrespective of income or wealth. This tendency to default under conditions of negative home equity has been confirmed empirically.⁷ In a sample of homeowners holding mortgages in 2006 and 2007, Cohen-Cole and Morse (2010) find that 74 percent of those households that became delinquent on their mortgage payments were nevertheless current on their credit card pay-

⁶ However, see Burns, Minnick, and Starks (2013) for links between culture and compensation in a tournament framework.

⁷ See, for example, Deng, Quigley, and Van Order (2000) and Elul et al. (2010).

ments, behavior consistent with strategic default. Moreover, homeowners with negative equity are found to be more likely to re-default, even when offered a mortgage modification that initially lowers their monthly payments (Quercia and Ding 2009). As Geanakoplos and Koniak observe in the aftermath of the bursting of the housing bubble:

Every month, another 8 percent of the subprime homeowners whose mortgages . . . are 160 percent of the estimated value of their houses become seriously delinquent. On the other hand, subprime homeowners whose loans are worth 60 percent of the current value of their house become delinquent at a rate of only 1 percent per month. Despite all the job losses and economic uncertainty, almost all owners with real equity in their homes are finding a way to pay off their loans. It is those "underwater" on their mortgages—with homes worth less than their loans—who are defaulting, but who, given equity in their homes, will find a way to pay. They are not evil or irresponsible; they are defaulting because . . . it is the economically prudent thing to do.⁸

Economists can confidently point to these facts when debating the relative importance of culture versus incentives in determining consumer behavior.

However, the narrative becomes more complex the further we dig into the determinants of strategic default. In survey data of one thousand U.S. households from December 2008 to September 2010, Guiso, Sapienza, and Zingales (2013, Table VI) show that respondents who know someone who strategically defaulted are 51 percent more likely to declare their willingness to default strategically. This contagion effect is confirmed by Goodstein et al. (2013), who, in a sample of more than thirty million mortgages originated between 2000 and 2008 that were observed from 2005 to 2009, find that mortgage defaults are influenced by the delinquency rates in surrounding ZIP codes, even after controlling for income-related factors. The authors' estimates suggest that a 1 percent increase in the surrounding delinquency rate increases the probability of a strategic default by up to 16.5 percent.

These results show that there is no simple dichotomy between incentives and culture. Neither explanation is complete because the two factors are inextricably intertwined and jointly affect human behavior in complex ways. Reacting to a change in incentives follows naturally from the unspoken assumptions of the economist. Economic incentives certainly influence human decisions, but they do not explain all behavior in all contexts. They cannot do so, because

⁸ John Geanakoplos and Susan Koniak, "Matters of Principal," *New York Times*, March 5, 2009.

humans are incentivized by a number of forces that are nonpecuniary and difficult to measure quantitatively. As Hill and Painter (2015) observe, these forces may include status, pride, mystique, and excitement. In addition, “what confers status is contingent, and may change over time.”⁹ These cultural forces often vary over time and across circumstances, causing individual and group behavior to adapt in response to such changes.

However, economists rarely focus on the adaptation of economic behavior to time-varying, nonstationary environments—our discipline is far more comfortable with comparative statics and general equilibria than it is with dynamics and phase transitions. Yet, changes in the economic, political, and social environment have important implications for the behavior of individual employees and corporations alike, as Hermalin (2001) underscores. To resolve this problem, we need a broader theory, one capable of reconciling the analytical precision of *Homo economicus* with the cultural tendencies of *Homo sapiens*.

7. VALUES FROM EVOLUTION: THE ADAPTIVE MARKETS HYPOTHESIS

If corporate culture is shaped from the top down, from the bottom up, and through incentives in a given environment, the natural question to ask next is, how? A corporation’s leadership may exert its authority to establish norms of behavior within the firm, but a corporation’s employees also bring their preexisting values to the workplace, and all of the actors in this drama have some resistance to cultural sway for noncultural, internal reasons. None of them are perfectly malleable individuals waiting to be molded by external forces. This resistance has never stopped corporate authority from trying, however. In one notorious case, Henry Ford employed hundreds of investigators in his company’s Sociological Department to monitor the private lives of his employees in order to ensure that they followed his preferred standard of behavior inside the factory and out (Snow 2013). The success or failure of such efforts depends critically on understanding the broader framework in which culture emerges and evolves over time and across circumstances.

Determining the origin of culture, ethics, and morality may seem to be a hopeless task, and one more suited to philosophers than economists. However, there has been surprising progress in the fields of anthropology, evolutionary biology, psychology, and the cognitive neurosciences that has

⁹ Hill and Painter (2015, p. 111).

important implications for economic theories of culture. For example, evolutionary biologists have shown that cultural norms such as altruism, fairness, reciprocity, charity, and cooperation can lead to advantages in survival and reproductive success among individuals in certain settings.¹⁰ E. O. Wilson argued even more forcefully that social conventions and interactions are, in fact, the product of evolution, coining the term “sociobiology” in the 1970s. More recent observational and experimental evidence from other animal species, such as our close cousins the chimpanzees, has confirmed

Determining the origin of culture, ethics, and morality may seem to be a hopeless task, and one more suited to philosophers than economists. However, there has been surprising progress. . . that has important implications for economic theories of culture.

the commonality of certain cultural norms, suggesting that they are adaptive traits passed down across many generations and species. A concrete illustration is the notion of fairness, a seemingly innate moral compass that exists in children as young as fifteen months as well as in chimpanzees.¹¹

This evolutionary perspective of culture arises naturally in financial economics as part of the adaptive markets hypothesis (Lo 2004, 2013), an alternative to the efficient markets hypothesis. In the adaptive markets hypothesis, financial market dynamics are the result of a population of individuals competing for scarce resources and adapting to past and current environments. This hypothesis recognizes that competition, adaptation, and selection occur at multiple levels—from the subtle methylation of sequences in an individual’s DNA, to the transmission of cultural traits from one generation to the next—and they can occur simultaneously, each level operating at speeds dictated by specific environmental forces. To understand what individuals value, and how they will behave in various contexts, we have to understand how they interacted with the environments of their past.

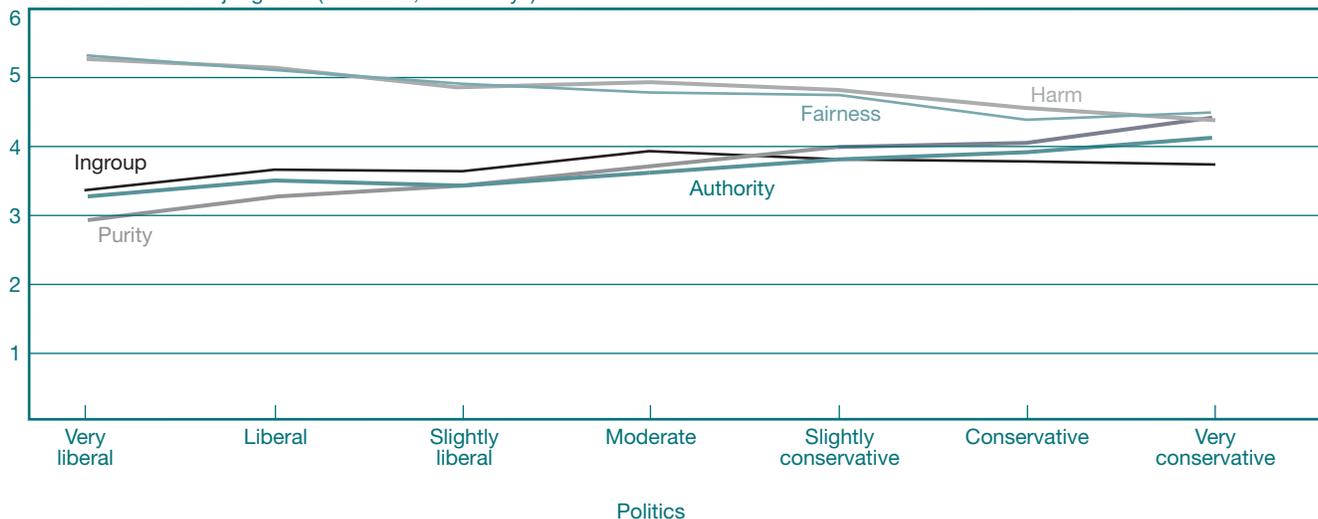
¹⁰ See, for example, Hamilton (1964); Trivers (1971); and Nowak and Highfield (2011).

¹¹ See Burns and Sommerville (2014) for recent experimental evidence of fairness with fifteen-month-old babies, and de Waal (2006) for similar experimental evidence for capuchin monkeys and chimpanzees.

CHART 1

The Importance of Haidt's Five Moral Dimensions among Individuals of Various Political Views

How relevant to moral judgment (1 = never, 6 = always)



Source: Haidt, J. 2007. "The New Synthesis in Moral Psychology." *Science* 316, no. 5827 (May): 998-1002. Figure 1. Reprinted with permission from AAAS.

The adaptive markets hypothesis explains why analogies to biological reasoning are often effective in the social sciences. Darwinian evolution is not the same process as cultural evolution, but the two processes occur under similar constraints of selection and differential survival. As a result, one can fruitfully use biological analogies, as well as biology itself, to explain aspects of culture—even of corporate culture, a concept that did not exist until the late nineteenth and early twentieth centuries. These explanations fall into two categories: explanations of individual behavior by itself, and explanations of the interactions between individuals that lead to group dynamics.

Viewing behavior at the level of the individual, recent research in the cognitive neurosciences has refined insights into the nature of moral and ethical judgments. These judgments arise from one of two possible neural mechanisms: one instinctive, immediate, and based on emotion; and the other more deliberative, measured, and based on logic and reasoning (Greene 2014). The former is fast, virtually impossible to override, and relatively inflexible, while the latter is slow, much more nuanced, and highly adaptive. This "dual-process theory" of moral and ethical decision making—which is supported by a growing body of evidence from detailed, experimental neuroimaging studies—speaks directly to the question at hand of the origin of culture. At this level of examination, culture is the combination of hardwired responses embedded in our neural circuitry, many innate and not easily reprogrammed, and more

detailed complex analytic behaviors that are path-dependent on life history, which *can* be reprogrammed (slowly) and are more in tune with our social environment.

Apart from its pure scientific value, the dual-process theory has several important practical implications. Current efforts to shape culture may be placing too much emphasis on the analytical process while ignoring the less malleable and, therefore, more persistent innate process. A deeper understanding of this innate process is essential to answering questions about whether and how culture can be changed. One starting point is the work of social psychologist Jonathan Haidt, who proposed five moral dimensions that are innately determined and whose relative weightings yield distinct cultural mores and value systems: harm versus care, fairness versus cheating, loyalty versus betrayal, authority versus subversion, and purity versus degradation.¹² Since the relative importance of these moral dimensions is innately determined, their presence in the population naturally varies along with hair color, height, and other traits.

Haidt and his colleagues discovered that, far from being distributed across the population in a uniformly random way, these traits had strong correlations to political beliefs (see Chart 1).¹³ For example, people in the United States who identified them-

¹² Haidt (2007). In more recent writings, Haidt has added a sixth dimension, liberty versus oppression.

¹³ Graham, Haidt, and Nosek (2009); Iyer et al. (2012).

selves as liberal believed that questions of harm/care and fairness/cheating were almost always relevant to making moral decisions. The other three moral foundations Haidt identified—loyalty/betrayal, authority/subversion, and purity/degradation—were much less important to liberals. However, those who identified themselves as conservative believed that all five moral foundations were equally important, although conservatives did not place as high an importance on any of the factors as liberals placed on fairness/cheating or harm/care. These traits had predisposed people to sort themselves into different political factions.

It takes little imagination to see this sorting process at work across professions. People who believe that fairness is the highest moral value will want to choose a vocation in which they can exert this value, perhaps as a public defender, a teacher of underprivileged children, or a sports referee. Those who believe, instead, that fairness is less important than other values might find themselves drawn to high-pressure sales, or indeed, Gordon Gekko's caricature of predatory finance. This is not to say that everyone in those professions shares those values, of course, but rather that individuals with those values may find such professions more congenial—a form of natural selection bias—and will, therefore, eventually be statistically overrepresented in that subpopulation.

At the same time that evolution shapes individual behavior, it also acts on how individuals relate to one another. We call the collective behavior that ultimately emerges from these interactions “culture.” It has been conceptually difficult for classical evolutionary theory to explain many forms of collective and group behavior because evolutionary theory is primarily centered on the reproductive success of the individual or, even more reductively, of the gene. Recent research in evolutionary biology, however, has revived the controversial notion of “group selection” (Nowak, Tarnita, and Wilson 2010), in which groups, not just individuals or genes, are the targets of natural selection. Although many evolutionary biologists have rejected this idea (Abbott et al. 2011), arguing that selection can occur only at the level of the gene, an application of the adaptive markets hypothesis can reconcile this controversy and also provide an explanation for the origins of culture.

The key insight is that individual behavior that appears to be coordinated is simply the result of certain common factors in the environment—“systematic risk” in the terminology of financial economics—that impose a common threat to a particular subset of individuals. Within specific groups under systematic risk, natural selection on individuals can sometimes produce group-like behavior. In such cases, a standard application of natural selection to

individuals can produce behaviors that may seem like the result of group selection but that are, in fact, merely a reflection of systematic risk in the environment (Zhang, Brennan, and Lo 2014).

For example, consider the extraordinary behavior of Specialist Ross A. McGinnis, a nineteen-year-old machine-gunner in the U.S. Army who, during the Iraq war, sacrificed himself when a fragmentation grenade was tossed into a Humvee during a routine patrol in Baghdad on December 4, 2006. McGinnis reacted immediately by yelling “grenade” to alert the others in the vehicle, and then pushed his back onto the grenade, pinning it to the Humvee's radio mount and absorbing the impact of the explosion with his body. His actions saved the lives of his four crewmates.¹⁴

Although this was a remarkable act of bravery and sacrifice, it is not an isolated incident. Acts of bravery and sacrifice have always been part of the military tradition, as documented

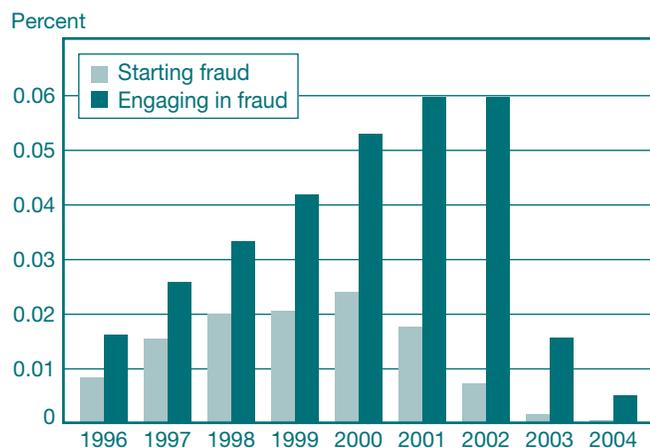
Individual behavior that appears to be coordinated is simply the result of certain common factors in the environment—“systematic risk” in the terminology of financial economics—that impose a common threat to a particular subset of individuals.

by the medals and other honors awarded to military heroes. Part of the explanation may be selection bias—the military may simply attract a larger proportion of altruistic individuals, people who sincerely believe that “the needs of the many outweigh the needs of the few.”

A more direct explanation, however, may be that altruistic behavior is produced by natural selection operating in the face of military conflict. Put another way, selfish behavior on the battlefield is a recipe for defeat. Military conflict is an extreme form of systematic risk, and over time and across many similar circumstances, the military has learned this lesson. However, altruistic behavior confers survival benefits for the population on the battlefield, even if it does not benefit the individual. Accordingly, military training instills these values in individuals—through bonding exercises like boot camp, stories of heroism passed down from seasoned veterans to new recruits, and medals and honors for

¹⁴ <http://www.army.mil/medalofhonor/mcginnis/profile/> (accessed March 20, 2015).

Chart 2
Estimated Percentage of Large Corporations Starting and Engaging in Fraud from 1996 to 2004



Source: Dyck, Morse, and Zingales (2013, Figure 1). Used by permission.

courageous acts—so as to increase the likelihood of success for the entire troop. Military culture is the evolutionary product of the environment of war.

Now consider an entirely different environment: Imagine a live grenade being tossed into a New York City subway car. Would we expect any of the passengers to behave in a manner similar to Specialist McGinnis in Baghdad? Context matters. And culture is shaped by context, as Milgram and Zimbardo discovered in their experiments with ordinary subjects placed in extraordinary circumstances (see Section 3).

Context matters not only on the battlefield but also in the financial industry. Cohn, Fehr, and Maréchal (2014) document the impact of context on financial culture in an experiment involving 128 human subjects recruited from a large international bank. These subjects were asked to engage in a task that measured their honesty, using a simple coin-tossing exercise in which self-reported outcomes determined whether they would receive a cash prize. Prior to this exercise, subjects were split into two groups. In one group, participants were asked seven questions pertaining to their banking jobs; in the other, participants were asked seven non-banking-related questions. By bringing the banking industry to the forefront of the subjects' minds just prior to the exercise, the authors induced the subjects to apply the cultural standards of that industry to the task at hand. The subjects in the former group showed significantly more dishonest behavior than the subjects in the latter group, who exhibited the same level of honesty as participants from

CHART 3
Frequency of SEC-Prosecuted Ponzi Schemes by Year from 1988 to 2012



Source: Deason, Rajgopal, and Waymire (2015, Figure 1). Used by permission.

non-banking industries. The authors concluded that “the prevailing business culture in the banking industry weakens and undermines the honesty norm, implying that measures to re-establish an honest culture are very important.”¹⁵

However, innate variation determines how much the individual is influenced by context. Gibson, Tanner, and Wagner (2015) show that even in cultures where there has been a crowding-out of honest behavior by situational norms, individuals with strong intrinsic preferences to honesty as a “protected” value resist the bad norm, and may potentially be able to form the nucleus of a good norm in an altered situation.

Two recent empirical studies of fraud provide additional support for the impact of context on financial culture. Dyck, Morse, and Zingales (2013) use historical data on securities class action lawsuits to estimate the incidence of fraud from 1996 to 2004 in U.S. publicly traded companies with at least \$750 million in market capitalization. They document an increasing amount of fraud as the stock market rose in the first five or six years of the period, but find that the fraud eventually declined in the wake of the bursting of the Internet bubble in 2001-02 (see Chart 2). This interesting pattern suggests that the business environment may be related to changes in corporate culture that involve fraudulent activity and corporate risk-taking behavior. Deason, Rajgopal, and Waymire (2015) find a similar pattern in the number of Ponzi schemes prosecuted by the U.S. Securities and

¹⁵ Cohn, Fehr, and Maréchal (2014, p. 86).

Exchange Commission (SEC) between 1988 and 2012 (see Chart 3). The number of schemes shows an upward trend during the bull market of the late 1990s, a decrease in the aftermath of the Internet bust of 2001-2002, and another increase as the market climbed until the financial crisis in 2007-2009, after which the number of Ponzi schemes fell sharply. In fact, Deason, Rajgopal, and Waymire estimate a correlation of 47.9 percent between the quarterly return on the S&P 500 index and the number of SEC-prosecuted Ponzi schemes per quarter, which they attribute to several factors: Ponzi schemes are harder to sustain in declining markets, and SEC enforcement budgets tend to increase after bubbles burst, owing to more demand for enforcement by politicians and the public. The authors also find that Ponzi schemes are more likely when there is some affinity link between the perpetrator and the victim, such as a common religious background or shared membership in an ethnic group, or when the victim group tends to place more trust in others (senior citizens, for example)—reminding us that culture can also be exploited maliciously.

These two studies confirm what many already knew instinctively: Culture is very much a product of the environment, and as environments change, so, too, does culture. Therefore, if we wish to change culture, we must first understand the forces that shape it over time and across circumstances. This broader contextual, environmental framework—informed by psychology, evolutionary theory, and neuroscience, and quantified through empirical measurement—will play a key role in Section 11, where we consider what can be done about culture from a practical perspective.

8. EXAMPLES FROM THE FINANCIAL INDUSTRY

Moving from the general to the specific, we now explore several recent financial debacles that demonstrate the role of corporate culture in financial failure. Let us start with a control case, the fall of Long-Term Capital Management (LTCM). In organizational theorist Charles Perrow's terminology, LTCM's collapse was a "normal accident" (Perrow 1999). That is, it was caused by a combination of "tight coupling" in the engineering sense—in which the execution of one process depends critically on the successful completion of another—and complex interactions within the financial system. To summarize a well-known story very briefly, LTCM's sophisticated models were caught off-guard by the aftermath of Russia's default on its

short-term government bonds, or GKO, on August 17, 1998, triggering a short and vicious cycle of losses and flights to liquidity and ultimately leading to LTCM's bailout on September 23, 1998.¹⁶

On paper, LTCM's corporate culture was excellent. The firm's composition was elite, as LTCM was founded by John Meriwether, the former head of bond trading at Salomon Brothers, and future Nobel Prize winners Robert C. Merton and Myron Scholes. Its culture was individualistic, as the cultures of many trading groups are, but the firm derived its authority from a legal-rational basis—the superiority of its mathematics. Its corporate culture played little direct role in its failure. In fact, with much of their personal fortunes invested in the business, LTCM's managing partners were perfectly aligned with their investors. Not a single client has sued them for inappropriate behavior. Not a single regulator has cited them for violations of any sort.

Because of this excellence, however, the general culture of Wall Street was caught off-guard by LTCM's predicament. LTCM's counterparties perceived the impressive firm to be a paragon of the industry's highest values—a combination of intelligence, market savvy, and ambition that was sure to succeed—when a more accurate assessment of LTCM might have been as an experimental engineering firm, working daringly (or hubristically, as some have argued) on the cutting edge. LTCM's creditors notoriously gave it virtually no "haircut" on loans, on the assumption that its trades were essentially risk free. In addition to these very low, or even zero, margin requirements, LTCM was able to negotiate other favorable credit enhancements with its counterparties, including two-way collateral requirements, rehypothecation rights, and high thresholds for loss.¹⁷ These were often made on the strength of the firm's reputation rather than on a detailed examination of its methods. Daniel Napoli, Merrill Lynch's head of risk management at the time, was quoted as saying, "We had no idea they would have trouble—these people were known for risk management. They had taught it; they *designed* it [emphasis in original]."¹⁸ (Napoli himself lost his position shortly after LTCM's collapse.) And so, while LTCM's failure may be viewed as akin to the failure of a bridge whose experimental materials were exposed to an unfamiliar stress, the behavior of LTCM's creditors is more likely a failure of their own corporate cultures.

¹⁶ See, for example, General Accounting Office (1999, 38-45).

¹⁷ GAO (1999, 42).

¹⁸ Lowenstein (2000, 179).

Corporate cultures can be overconfident in their abilities to assess risk. This overconfidence can be seen in the fall of the large multinational insurer American International Group (AIG) in 2008. Under its original chairman, Maurice “Hank” Greenberg, AIG was run not merely hierarchically, but almost feudally, with reciprocal chains of loyalty and obligation centered on Greenberg.¹⁹ In fact, Greenberg had deliberately structured AIG’s compensation plan to promote lifetime loyalty to the firm. Greenberg was, in Weberian terms, a charismatic authority, overseeing each division of his large, multinational organization personally. In regular questioning sessions, Greenberg demanded to know exactly what risks each unit of AIG was taking and what measures were being used to reduce them. Many observers ascribed AIG’s continued growth to the firm’s excellent practice in insurance underwriting, closely monitored by Greenberg.

However, the “headline risk” of Greenberg’s possible role in financial irregularities caused AIG’s board of directors to replace him with Martin Sullivan in early 2005. Sullivan had risen through the ranks of AIG, originally starting as a teenage office assistant. Sullivan assumed that AIG’s vigorous culture of risk management would maintain itself without Greenberg at the helm. Meanwhile, Joseph Cassano, the head of AIG’s Financial Products (AIGFP) unit, had a working relationship with Greenberg that did not transfer to Sullivan. Cassano’s conduct grew more aggressive without Greenberg’s check on his behavior (Boyd 2011, 161).

AIGFP’s portfolio contained billions of dollars of credit default swaps (CDS) on “toxic” collateralized debt obligations. These CDS were not the only toxic items on AIG’s balance sheet, which also reflected significant problems in the company’s securities lending program, but they were the largest, and they created the most visible effects during the financially dangerous autumn of 2008. While AIGFP’s first sales of CDS on collateralized debt obligations began in 2004, during Greenberg’s tenure, they accelerated into 2005, before executives within AIGFP convinced Cassano about declining standards in the subprime mortgage market. AIGFP’s final sale of CDS took place in early 2006, leaving a multibillion-dollar time bomb on AIG’s balance sheet, which the prolonged downturn in the housing market started ticking. Cassano defended his actions in an increasingly adverse environment until his ouster from AIG in early 2008 (Boyd 2011, 258-62).

It is probably too easy to ascribe AIGFP’s extended period of CDS sales to Greenberg’s departure. As noted, Cassano’s unit began selling CDS well before Greenberg’s exit. However,

¹⁹ Boyd (2011) and Shelp and Ehrbar (2009) provide two viewpoints of AIG’s culture from which a triangulation can be made.

Robert Shiller’s insight into the Milgram experiment is pertinent here. Greenberg’s culture of risk management, which was accompanied by consistently high growth in the traditionally low-growth insurance industry, led Cassano and Sullivan to believe that AIG’s risk management procedures were consistently reliable under conditions where they were not. Paradoxically, the moral hazard of past success may have led AIG to make much riskier investments than a company with a poorer track record of risk management would have made.

Some corporate cultures actively conceal their flaws and irregularities, not only from the public or from regulators but also from others within the corporation itself because of the risk that wider knowledge of these issues might

Some corporate cultures actively conceal their flaws and irregularities, not only from the public or from regulators but also from others within the corporation itself because of the risk that wider knowledge of these issues might undermine the firm’s position.

undermine the firm’s position. For example, let us look at Lehman Brothers’ use of the “Repo 105” accounting trick.²⁰ Briefly, this was a repo, or repurchase agreement, valued at \$1.05 for every dollar, that was designed to look like a sale. Lehman Brothers paid more than five cents on the dollar to temporarily pay down the liabilities on its balance sheet before it repurchased the asset. The firm used this accounting trick in amounts totaling \$50 billion in late 2007 and 2008 to give itself a greater appearance of financial health—which, of course, was ultimately a failure.

Was this tactic legal? Because no American law firm would agree to endorse it, Lehman Brothers engaged in regulatory arbitrage and found a distinguished British law firm, Linklaters, willing to give the practice its imprimatur. Linklaters’ endorsement of Repo 105 was kept secret from the outside world (except for Lehman’s auditors, Ernst and Young, who also allowed the practice to pass²¹) and also from Lehman’s

²⁰ Valukas (2010).

²¹ Valukas (2010, 782-6 and 948-51). See also Nolder and Riley (2014) for the impact of cultural differences on auditors.

board members.²² Lehman Brothers omitted its use of Repo 105 in its quarterly disclosures to the SEC and also neglected to tell its outside disclosure counsel.²³

In contrast to LTCM, the corporate culture at Lehman Brothers less resembled a cutting-edge engineering firm experiencing an unforeseen design failure than it did Zimbaro's Stanford experiment. An internal hierarchy within Lehman's management deliberately withheld information about the firm's misleading accounting practices from outsiders who might have objected, as well as from those within the firm, because this internal hierarchy believed that was its proper role. When Lehman's global financial controller reported to two consecutive chief financial officers his misgivings that Repo 105 might be a significant "reputational risk" to the company, his concerns were ignored.²⁴ Lehman's hierarchical culture defended its values against voices from its border, even though these voices occupied central positions on its organizational chart. Instead of taking measures to avoid headline risk, the firm buried its practices in secrecy.

The case of rogue trader Jérôme Kerviel illustrates another possible type of failure of corporate culture, that of neglect. Unauthorized, or rogue, trading is necessarily a form of fraud, since it deliberately evades the legal responsibilities of proper financial management. In January 2008, Kerviel, a trader in the corporate and investment banking division of the French bank Société Générale, built up a €49 billion long position on index futures before his trades were detected (Société Générale 2008, 2). For comparison purposes, Société Générale's total capital at the time was only €26 billion. Unwinding his unauthorized position cost Société Générale €6.4 billion, an immense loss that threatened to take down the bank. Kerviel's legal difficulties are still ongoing, but he has stated that Société Générale turned a blind eye to his activities when they were making money—and Société Générale's own internal investigation reports that he made €1.5 billion for the bank on his unauthorized trades in 2007.

However, the internal investigation paints a very different, if equally unflattering, picture of Société Générale's corporate culture. Kerviel's first supervisor did not notice his early fraudulent trades or the cover-up of those trades but, in fact, allowed Kerviel to make intraday trades, a privilege well above Kerviel's status as a junior trader. In January 2007, Kerviel's supervisor quit, and his trading desk was left effectively unsupervised for three months. During this time, Kerviel built up a futures position of €5.5 billion, his first very large position. His new desk

manager, hired in April 2007, had no prior knowledge of Kerviel's trading activities and did not use the monitoring programs that would have detected his trades. Moreover, Kerviel's new manager was not supported by his own supervisor in assisting or supervising Kerviel's new activities. The Société Générale report found that a culture of inattention and managerial neglect existed up to four levels above Kerviel's position, to the head of Société Générale's arbitrage activities (Société Générale 2008, 3-8). Ultimately, it was the attention and perseverance of a monitor in Société Générale's accounting and regulatory reporting division that caught Kerviel, after the monitor noticed an unhedged €1.5 billion position while calculating the Cooke ratio for Société Générale's Basel compliance requirements (Société Générale 2008, 31-4).

This is Douglas's individualistic culture taken to a point of absurdity. Mark Hunter and N. Craig Smith believe that the roots of Société Générale's Corporate and Investment Banking division's inept management culture can be found in the firm's complex corporate history (Hunter and Smith 2011). Société Générale was a private retail bank nationalized after the Second World War and then privatized again in 1986. Throughout its postwar history, however, the bank was a proving ground for elite French graduates, similar to the way Wall Street investment banks recruit from Ivy League universities in the United States. The key difference is that the elite focused its oversight on Société Générale's retail banking business, because of its close connection to French policymakers in the public and private sectors, rather than its proprietary trading desks. Société Générale's corporate culture viewed the Corporate and Investment Banking division as a "cash machine," not central to the bank's elite outcomes. Kerviel, a graduate of provincial universities, was not expected to rise in the elite hierarchy. Therefore, little attention was paid to his activities, even when he made surprisingly large amounts of money.

9. REGULATORY CULTURE

Regulatory culture is hardly immune to these challenges. Consider the unraveling of the mother of all Ponzi schemes: Bernard Madoff's. The SEC formally charged Madoff with securities fraud on December 11, 2008, the day after Madoff's sons turned him in to the Federal Bureau of Investigation. Justice was swift in this case; on March 12, 2009, Madoff pleaded guilty to all charges.²⁵ However, although justice was swift, the SEC's internal Office of Investigations discovered

²² Valukas (2010, 945-7).

²³ Valukas (2010, 853-6).

²⁴ Valukas (2010, 884-7).

²⁵ SEC (2009, 1).

that the SEC was not. The Office of Investigations learned that the SEC had received six “red flag” complaints about Madoff’s hedge fund operations, dating as far back as 1992, and had been presented with two reputable articles in the trade and financial press from 2001 that questioned Madoff’s abnormally consistent returns.²⁶

It is instructive to consider how the SEC’s culture dealt with these claims. A portfolio manager named Harry Markopolos submitted the earliest of the analytical complaints about Madoff’s performance to the SEC. Markopolos, originally with Rampart Investment Management, found he could not replicate Madoff’s returns without making impossible assumptions. Markopolos submitted his findings to the SEC several times to no avail: in 2000, through its Boston office, a complaint that was never recorded as reaching the SEC’s Northeast Regional Office (NERO);²⁷ in 2001, a submission that NERO decided not to pursue after one day’s analysis;²⁸ in 2005, which I will discuss in further detail below; a significant follow-up e-mail in 2007, which was “ignored,” in the words of the Office of Investigations report;²⁹ and in April 2008, which failed to arrive owing to an incorrect e-mail address.³⁰

Two similar analyses were brought to the SEC’s attention, one directly and one indirectly. In May 2003, an unnamed hedge fund manager contacted the SEC’s Office of Compliance Inspections and Examinations (OCIE) with a parallel analysis.³¹ In November 2003, upper management at hedge fund Renaissance Technologies became concerned that Madoff’s returns were “highly unusual” and that “none of it seems to add up.” In April 2004, this Renaissance correspondence was flagged for attention by a compliance examiner at NERO during a routine examination.³²

OCIE and NERO conducted two separate, independent examinations of Madoff. Each examination was unaware of the other, until Madoff himself informed examiners of their mutual existence. (OCIE had not used the SEC’s tracking system to update the status of its examination; however, NERO had not checked the system, rendering the point moot.)³³ OCIE passed its unresolved examination

²⁶ SEC (2009, 21-2); Michael Ocrant, “Madoff Tops Charts; Skeptics Ask How,” *MARHedge*, May 2001; Erin Arvedlund, “Don’t Ask, Don’t Tell,” *Barron’s*, May 7, 2001.

²⁷ SEC (2009, 61-7).

²⁸ SEC (2009, 67-74).

²⁹ SEC (2009, 61 and 354).

³⁰ SEC (2009, 361-3).

³¹ SEC (2009, 77-80).

³² SEC (2009, 145-9).

³³ SEC (2009, 195-7).

documents to NERO and made no further communication with NERO about the case.³⁴ Although NERO examiners still had important questions about Madoff’s actions, NERO closed the examination before they were answered because of cultural time constraints. “There’s no hard and fast rule about field work but . . . field work cannot go on indefinitely because people have a hunch,” one NERO assistant director later testified.³⁵

Markopolos’ 2005 complaint reached NERO with the strong endorsement of the SEC’s Boston office.³⁶ However, the previous fruitless examination of claims against Madoff biased the NERO examiners against Markopolos’ claim.³⁷ The examiners quickly discounted Markopolos’ idea that Madoff was running a Ponzi scheme. The staff attorney involved with the examination wrote at the beginning of the investigation that there wasn’t “any *real* reason to suspect some kind of wrongdoing . . . all we suspect is disclosure problems [emphasis in original].”³⁸ The Office of Investigations was harsh in its verdict: “As a result of this initial failure, the Enforcement staff never really conducted an adequate and thorough investigation of Markopolos’ claim that Madoff was operating a Ponzi scheme.”³⁹

The Madoff failure, summarized above in a necessarily streamlined account, was only one of many events that caused the internal culture of the SEC to fall under scrutiny. An extensive study of the SEC by the Government Accountability Office (GAO) in 2012 and 2013 found systemic problems throughout its organizational culture:⁴⁰

Based on analysis of views from Securities and Exchange Commission (SEC) employees and previous studies from GAO, SEC, and third parties, GAO determined that SEC’s organizational culture is not constructive and could hinder its ability to effectively fulfill its mission. Organizations with constructive cultures are more effective and employees also exhibit a stronger commitment to mission focus. In describing SEC’s culture, many current and former SEC employees cited low morale, distrust of management, and the compartmentalized, hierarchical, and risk-averse nature of the organization. According to an Office of Personnel Management (OPM) survey

³⁴ SEC (2009, 136-8).

³⁵ SEC (2009, 223).

³⁶ SEC (2009, 240-4).

³⁷ SEC (2009, 255-9).

³⁸ SEC (2009, 266-8).

³⁹ SEC (2009, 368).

⁴⁰ Government Accountability Office (2013).

of federal employees, SEC currently ranks 19th of 22 similarly sized federal agencies based on employee satisfaction and commitment. GAO's past work on managing for results indicates that an effective personnel management system will be critical for transforming SEC's organizational culture.

Apparently, the SEC's hierarchical culture was hardened into "silos," which not only prevented the flow of information from one division to another but also hindered the flow of information between management and staff.⁴¹ Morale, the sense of shared purpose, was low among staff, but management believed it was much higher.⁴² Despite earlier initiatives, the SEC's culture had grown more risk-averse over time, and a majority of both staff and senior officers explicitly agreed that this was owing to the fear of public scandal. Some staff members anonymously reported that "managers have been afraid to close cases or make decisions because senior officers want to minimize the chances that they would be criticized later."⁴³

The GAO concluded its report with seven specific recommendations for changing the SEC's culture. These included improvements in coordination and communication across internal departments and other agencies—presumably to prevent future cases like Madoff's from slipping through the cracks—and changes in personnel management practices to better align job performance with compensation and promotions. The SEC agreed with all seven recommendations. By its own account, it has made significant progress in addressing each of them since then. For example:⁴⁴

Based on GAO's recommendations, SEC made significant efforts to improve communication and collaboration. In an effort to optimize communications and collaboration, the SEC benchmarked and implemented a variety of best practices used both within the public and private sector, including cross-agency working groups, an agency-wide culture change initiative, and a more robust internal communication strategy. Work continues in this area to ensure that employees across the SEC are sharing critical information. . . . The purpose of OPM's audit was to determine SEC's adherence to merit system principles, laws, and regulations, and to assess the efficiency and effectiveness in administering human resources programs under the Talent Management System of the Human Capital

⁴¹ GAO (2013, 33-8).

⁴² GAO (2013, 11). To be clear, low morale was not an issue at the SEC in 2008 but emerged in the wake of the unraveling of the Madoff Ponzi scheme and the realization that the SEC had failed to prevent it.

⁴³ GAO (2013, 16-7).

⁴⁴ SEC (2014, 132).

Framework. OHR is currently in the process of addressing all of the required and recommended actions identified in the OPM audit and anticipates that all recommendations will be resolved by the end of FY 2015.

These changes seem to be having an impact. The SEC's score on the OPM's Global Satisfaction Index—based on the same survey⁴⁵ cited in the GAO's earlier report—improved from 59 in 2012 to 65 in 2014. For comparison, in 2014, the agency with the highest job satisfaction rating was the National Aeronautics and Space Administration (an index value of 74), the agency with the lowest rating was the Department of Homeland Security (an index value of 48), and the government-wide index value was 59.

10. THE ROLE OF FEEDBACK LOOPS

Although the SEC's improvements may seem too little too late to those swindled by Madoff, the process by which these changes were proposed and implemented is a significant mechanism through which culture can be modified. By conducting a thorough, nonpartisan analysis of what happened, how it happened, why it happened, and what can be done to reduce the likelihood of it happening again in the future, the GAO provided important feedback that led to improvements at the SEC, including improvements in its organizational culture. And this is not the only institutional feedback mechanism now in place at the SEC. The SEC Office of the Inspector General—an independent office within the SEC that conducts periodic audits and investigations within the agency—provides ongoing feedback to the SEC's leadership to "prevent and detect fraud, waste, and abuse and to promote integrity, economy, efficiency, and effectiveness in the Commission's programs and operations."⁴⁶ Meanwhile, regular employee surveys conducted by the OPM and the SEC provide objective metrics by which to measure progress and identify problems with morale and culture as they emerge. The well-known adage that "one cannot manage what one does not measure" encapsulates the critical role that metrics and feedback play in managing culture.

Perhaps the best example of the impact that negative feedback can have is the work of the National Transportation Safety Board (NTSB), an independent government agency with no regulatory authority whatsoever. The NTSB's mandate is to investigate accidents, provide careful and conclusive

⁴⁵ Office of Personnel Management (2014).

⁴⁶ http://www.sec.gov/about/offices/inspector_general.shtml (accessed March 18, 2015).

forensic analysis, and make recommendations for avoiding such accidents in the future. When an airplane crashes, the NTSB assembles a pre-arranged team of on-call engineers and flight-safety experts who are immediately dispatched to the crash site to conduct a thorough investigation. This laborious process includes interviewing witnesses, poring over historical flight logs and maintenance records, and sifting through the wreckage to recover the flight recorder, or “black box,” and, if necessary, reassembling the aircraft piece by jigsaw piece to determine the ultimate cause of the crash. Once the team’s work is done, the NTSB publishes a report summarizing the investigation, concluding with specific recommendations for avoiding future occurrences of similar accidents. The report is entered into a searchable, publicly available database.⁴⁷ Despite having no regulatory authority, the NTSB has had enormous impact through these reports, which have been one of the major factors underlying the stunning improvement in the safety record of modern air transportation.

One concrete example of the NTSB’s impact involves the now-standard practice of spraying airplanes with de-icing fluid just prior to takeoff when it is raining or snowing and the temperature is near freezing. This procedure was instituted in the aftermath of the crash of USAir Flight 405 on March 22, 1992. Flight 405 stalled just after becoming airborne because of accumulated ice on its wings. De-icing fluid had been applied just before the aircraft left its gate, but takeoff was delayed because of air traffic when the plane was on its way to the runway, and ice re-accumulated on the plane’s wings while it waited for a departure slot in the freezing rain. The NTSB Aircraft Accident Report AAR-93/02—published February 17, 1993, and available through several websites—summarized the NTSB’s findings:

The National Transportation Safety Board determines that the probable causes of this accident were the failure of the airline industry and the Federal Aviation Administration to provide flightcrews with procedures, requirements, and criteria compatible with departure delays in conditions conducive to airframe icing and the decision by the flightcrew to take off without positive assurance that the airplane’s wings were free of ice accumulation after 35 minutes of exposure to precipitation following de-icing. The ice contamination on the wings resulted in an aerodynamic stall and loss of control after liftoff. Contributing to the cause of the accident were the inappropriate procedures used by, and inadequate coordination between, the flightcrew that led to a takeoff rotation at a lower than prescribed air speed.

⁴⁷ http://ntsb.gov/_layouts/ntsb.aviation/index.aspx.

Rather than placing blame on the technology or on human error, the NTSB conducted a thorough forensic examination and concluded that a systemwide failure to apply the technology correctly—waiting too long after de-icing and not checking for ice buildup just before takeoff—caused the crash. The change in de-icing procedures following this tragedy has no doubt saved many lives, thanks to NTSB Report AAR-93/02, but this particular innovation did not come cheaply. It was paid for with the lives of the twenty-seven individuals who died in the crash of Flight 405. Imagine the waste if the NTSB had not investigated this tragedy and produced concrete recommendations to prevent it from happening again.

Financial crashes are far less deadly, generally involving no immediate loss of life. However, the recent financial crisis and its impact on people’s lives should be enough motivation to create a “Capital Markets Safety Board” (CMSB) dedicated

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to investigating, reporting, and archiving the “accidents” of the financial industry. The CMSB would maintain teams of experienced professionals—forensic accountants, financial engineers from industry and academia, and securities and tax attorneys—who work together on a regular basis. Over the course of many investigations of major financial disasters, a number of new insights, common threads, and key issues would emerge from CMSB analyses. The publicly available reports from the CMSB would yield invaluable insights for those seeking to protect their future investments from similar fates, and, once in the hands of investors, this information would eventually drive financial institutions to improve their “safety records.”

A case in point is the Madoff Ponzi scheme. While several reports have been written on the SEC’s failure to recognize and stop this massive fraud, the forensic analysis on how Bernard Madoff—a highly respected and successful businessman who accumulated a huge fortune long before he began conning investors—came to commit such a crime has yet to be written. What was the cultural

milieu that gave rise to Madoff? How did someone with so many genuine accomplishments come to defraud friends and family, not to mention legions of admiring and (in not a few cases) worshipful investors? Is this an isolated incident that can be forgotten now that the perpetrator is behind bars, or should it serve as a cautionary tale because we each have the capacity for similar crimes within us? And what were the factors that allowed even sophisticated institutional investors to be duped and seduced by Madoff? Greed? Exclusivity? Competitive pressures from a low-yield environment and gyrating stock markets? Madoff's power and wealth? Unless we begin conducting forensic analyses of cultures gone wrong so we can learn what and how to change, we will be condemned to repeat the mistakes of our past. We need a CMSB.

As an aside, consider the cultural features that have led to the NTSB's success. The NTSB's culture of definitive expertise and teamwork has earned the public's trust, and the agency is widely regarded as "the best in the

Skeptics would argue that, like fighting city hall or trying to cheat death, attempting to change a large organization's culture is a Sisyphean task. . . . The adaptive markets hypothesis provides a framework in which we can think systematically about taking on this challenge.

business," not just in the United States but throughout the world (Lebow et al. 1999, 2). If we apply the classification scheme discussed earlier in this article, the NTSB has an individualistic culture with an elite composition and a legal-rational basis for its authority, but with a twist: small teams are the cohesive, accountable unit in the organization, rather than individuals per se. This organizational structure increases the sense of shared purpose during an investigation, while allowing flexibility of assignments at other times. Unlike at other regulatory agencies, a job at the NTSB is considered the capstone of a career, rather than a stepping stone. As a result, the NTSB is that rarest of government agencies: a highly focused, effective organization with strong morale (Fielding, Lo, and Yang 2011, 29-33).

11. PRACTICAL IMPLICATIONS FOR REGULATORS AND RISK MANAGERS

Corporate culture is clearly a relevant factor in financial failure, error, and malfeasance. As we have seen, risk priorities mirror a corporate culture's values, since no corporation has the resources to manage risk perfectly. Société Générale put very little priority on managing its trading desks, which reflected the low value it placed on its traders. Lehman Brothers spent more time concealing the flaws in its balance sheet than it spent remedying them—the risk of disclosure was more important than the risk of bankruptcy. AIG felt so secure in its practice of risk management that it allowed billions of dollars of toxic assets to appear on its balance sheet not once, but twice, the second in its much less publicized but comparably vulnerable securities lending program. These generalizations contain grains of truth, but they offer little guidance on what to change and how to change it.

What is the best way to immunize against the Gordon Gekko effect? The psychologist Philip Zimbardo put it succinctly enough: Resist situational influences (Zimbardo 2007, 451-6). Zimbardo was lucky enough to have a dissenting opinion that he implicitly trusted before his prison experiment spiraled out of control. Since that time, Zimbardo has investigated how the surrounding culture can influence good people to do evil things, much as the character Bud Fox was seduced by Gordon Gekko's culture in *Wall Street*. Zimbardo offers ten key behaviors that he believes will minimize the effectiveness of a destructive culture in spreading its values, whether corporate or otherwise. Among them are the willingness to admit mistakes, the refusal to respect unjust authority, the ability to consider the future rather than the immediate present, and the individual values of honesty, responsibility, and independence of thought. These behaviors may sound hackneyed, but they are no more hackneyed than the instructions to cover one's mouth while coughing or to wash one's hands regularly to prevent the spread of communicable diseases.

However, skeptics would argue that, like fighting city hall or trying to cheat death, attempting to change a large organization's culture is a Sisyphean task. How can any single agent expect to change attitudes and behavioral patterns that can span years and tens of thousands of current and former employees? While I believe such skepticism is misplaced, the dual-process theory of moral and ethical decision making does explain one source of this skepticism: It is indeed hard to change innate behavior, by definition. But the dual-process theory also implies a

path by which culture *can* be changed. More practically, the adaptive markets hypothesis provides a framework in which we can think systematically about taking on this challenge.

The first step is a subtle but important semantic shift. Instead of seeking to “change culture,” which seems naïve and hopelessly ambitious, suppose our objective is to engage in “behavioral risk management.”⁴⁸ Despite the fact that we are referring to essentially the same goal, the latter phrase is more concrete, actionable, and unassailable from a corporate gov-

Human behavior is a factor in virtually every type of corporate malfeasance; hence, it is only prudent to take steps to manage those behaviors most likely to harm the business.

ernance perspective. Human behavior is a factor in virtually every type of corporate malfeasance; hence, it is only prudent to take steps to manage those behaviors most likely to harm the business. Once this semantic leap has been made, it is remarkable how readily more practical implications follow. By drawing on traditional risk management protocols used at all major financial institutions, we can develop a parallel process for managing behavioral risk.

Consider, for example, the typical process used to manage the risk of a financial portfolio (Lo 1999), which can be summarized by the mnemonic SIMON (Select, Identify, Measure, Optimize, Notice). First, select the major risk factors driving portfolio returns; second, identify the objective function to be optimized, along with any constraints that must be satisfied; third, measure the statistical laws of motion governing portfolio-return dynamics; fourth, optimize the objective function subject to the return dynamics and any constraints, which yields the optimal portfolio weights and hedging positions; and finally, notice any change in the system and repeat the previous four steps, as needed. Any systematic financial risk-management protocol must have every element of SIMON represented in some fashion. For example, an emerging market debt fund might select exchange rates and interest rates as the major risk factors affecting the fund; identify the information ratio as the objective to be optimized; measure exchange rate and interest rate dynamics using statistical time series and mathematical term structure models; optimize the information ratio subject to these dynamics and

⁴⁸ I thank Hamid Mehran for suggesting this terminology.

a volatility or tracking-error constraint; and notice when the optimal weights for futures and forward contracts require rebalancing, and start the process all over again. SIMON says “manage your risk!”

Now consider applying SIMON to the management of behavioral risks. First, select the major behavioral risks facing the firm—for example, a lack of appreciation and respect for compliance procedures, senior management’s intolerance for opposing views, the cutting of corners with respect to operational policies and procedures to achieve growth and profitability targets, and so on. Second, identify the objective function and constraints—for example, corporate values, short- and long-run goals, and the firm’s mission statement. Third, measure the statistical “laws of motion” governing behavior—for example, the dual-process theory of moral reasoning, Haidt’s five-factor model, and the OPM’s Global Satisfaction Index. Fourth, optimize the objective function subject to constraints, which yields the optimal compensation structures and hedging instruments—that is to say, compliance procedures, reporting requirements, and supervisory relationship—for aligning the culture with the objectives. Finally, and most importantly, notice any changes in the system to ensure that the behavioral risk management protocol is achieving the desired result, and repeat the previous four steps as often as needed.

The weakest link in this analogical chain is the third: measuring behavioral laws of motion. Our quantitative understanding of human behavior is still in its infancy, and without reasonably accurate predictive analytics, behavioral risk management is more aspirational than operational. In the case of financial risk management, the laws of motion of asset returns are readily available from a multitude of risk management software platforms and real-time data vendors in the form of linear factor models, credit scores, and value-at-risk and loss-probability models. Nothing comparable exists to support behavioral risk managers. Psychological profiles, social network maps, and job satisfaction surveys such as those conducted by the OPM are currently relegated to human resources departments, not risk committees or corporate boards.

However, the starting point for any scientific endeavor is measurement. Psychological profiles, social networks, and human resources data can serve as the basis for constructing behavioral risk models, perhaps along the lines implied by the work of social psychologists such as Haidt (2007), and empirically based models of the systematic and idiosyncratic factors underlying fraud, malfeasance, and excessive risk-taking behavior, as described in Dyck, Morse, and Zingales (2013) and Deason, Rajgopal, and Waymire (2015). But even before attempting to construct such models, we can

learn a great deal by simply documenting the reward structure for individuals within an organization so as to develop an integrated view of the corporate ecosystem. For example, if a financial institution's chief risk officer (CRO) is compensated through bonuses tied only to the firm's profitability and not to its stability, it should be obvious that risk may not be the CRO's primary focus.

From a quantitative perspective, the ultimate achievement would be an empirically based methodology for predicting individual and group behavior to some degree as a function of observable systematic and idiosyncratic factors. For example, imagine being able to quantify the risk appetite of financial executive i by the linear factor model

$$\begin{aligned} \text{Risk Appetite}_i = & \alpha_i + \beta_{i1}(\text{Reward}) + \beta_{i2}(\text{Potential Loss}) \\ & + \beta_{i3}(\text{Career Risk}) + \beta_{i4}(\text{Competitive Pressure}) \\ & + \beta_{i5}(\text{Peer Pressure}) + \beta_{i6}(\text{Self-Image}) \\ & + \beta_{i7}(\text{Regulatory Environment}) + \varepsilon_i \end{aligned}$$

where the coefficients measure how important each factor is to the executive's risk appetite and the factors vary across time, circumstances, and institutions. If we could estimate such a behavioral risk model for each executive, then we would be able to define "culture" quantitatively as a preponderance of individuals with numerically similar factor loadings. A culture of excessive risk taking and blatant disregard for rules and regulations might consist of an entire division of individuals who share very high loadings for the "Reward" and "Competitive Pressure" factors and very low loadings for the "Potential Loss" and "Regulatory Environment" factors. If such a risk model could be empirically estimated, we would begin to understand the Gordon Gekko effect at a more granular level and to develop ways to address it. Moreover, since this framework implicitly acknowledges that the factors driving behavior are time-varying and context-dependent, as competitive pressures increase owing to low yields and increased competition, regulators can expect behavior to change and should adapt accordingly.

Such a framework may seem more like science fiction than science at this point, but its development has already begun. In 2009, in the aftermath of the financial crisis, De Nederlandsche Bank (DNB), the Dutch central bank, proposed a new approach to supervising banks. In a memorandum titled "The Seven Elements of Ethical Culture" (De Nederlandsche Bank 2009), the bank said:

This document presents DNB's strategy on the issue of behaviour and culture. It describes the background and reasons why it is important to include ethical

behaviour and culture in supervision, sets out the legal framework for doing so, and explains what the current situation is, both within institutions and in the exercise of supervision by DNB. In presenting these elements for an ethical culture and sound conduct, this document describes the supervisory model that DNB wishes to follow in determining its supervisory efforts and, in a general sense, the plan of action for 2010-2014.

To support this effort, DNB has created the Expert Centre on Culture, Organisation, and Integrity, hired organizational psychologists and change experts, and launched several internal research projects to develop new supervisory methods specific to corporate culture.⁴⁹

More recently, researchers at the Federal Reserve Bank of New York undertook an important empirical first step in creating a behavioral risk model: They conducted and published a survey about the New York Fed's supervisory activities for large financial institutions, describing how these activities are staffed, organized, and implemented by the New York Fed on a day-to-day basis (Eisenbach et al. 2015). This survey provides an unprecedented level of transparency into bank supervision for the many stakeholders not privy to these policies and procedures. As observed by the authors of the survey, "Understanding how prudential supervision works is a critical precursor to determining how to measure its impact and effectiveness."

Once the specific behaviors, objectives, and value systems in the corporate culture are identified and quantified, the alignment of corporate values . . . with behavior can be facilitated in a number of ways. Economic incentives are the most direct approach, and the one favored by economists and the private sector.

Pan, Siegel, and Wang (2015) provide another example of a new breed of empirical analysis of culture by economists. They define and measure corporate risk culture by determining the risk preferences among corporate founders, executives, and board members at more than

⁴⁹ See Nuijts and de Haan (2013) for further details of DNB's current efforts on supervising bank culture.

6,000 U.S. public firms from 1996 to 2012, using surnames to infer cultural heritage and then linking this heritage to the risk attitude of the country of origin. Although surely imperfect and subject to the obvious critique of overly broad generalizing and cultural stereotyping, this intriguing method of inferring risk culture is worthy of study and, with time and collective effort, can be refined as a better understanding of its strengths and weaknesses is developed. As Knight (1940, 16) instructed, “. . . and when you can't measure, measure anyhow.”

Once the specific behaviors, objectives, and value systems in the corporate culture are identified and quantified, the alignment of corporate values and mission with behavior can be facilitated in a number of ways. Economic incentives are the most direct approach, and the one favored by economists and the private sector (see Section 6). However, other tools are available to the behavioral risk manager, including changes in corporate governance, the use of social networks and peer review, and public recognition or embarrassment.

If, for example, an organization is concerned about insufficient controls owing to a culture that equates risk taking with power and prestige, consider the following three measures: First, the organization can appoint a CRO who (1) reports directly to the company's board of directors, (2) can only be removed by a vote of the board, and (3) has the authority and the responsibility to temporarily relieve the CEO of his or her responsibilities if the CRO determines that the firm's risk levels are unacceptably high and the CEO has not responded to the CRO's request to reduce risk. A second, more radical measure to change the risk-taking culture of an organization is to make all employees who are compensated above some threshold, let's say one million dollars, jointly and severally liable for all lawsuits against the firm. Such a measure would greatly increase the scrutiny that these well-paid individuals place on their firm's activities, reducing the chances of misbehavior. A third, even more extreme, measure is Kane's (2015) proposal to hold individual executives criminally liable for not fulfilling a fiduciary duty to the public, which would no doubt change the corporate culture of important financial institutions.

Of course, such measures would also greatly decrease the amount of risk that the firm is willing to take, which may not sit well with shareholders. Balancing the trade-offs between

various incentives and governance mechanisms will ultimately determine the kind of culture that emerges and whether this culture is consistent with the corporation's core values and mission.

A similar behavioral risk model can, of course, be estimated for regulators. The recent reforms at the SEC provide an opportunity to consider how quantitative metrics, such as those produced by the OPM survey, can be combined with empirical patterns of corporate fraud and malfeasance to produce more adaptive regulation. For example, rising markets should be accompanied by increasing surveillance for potential Ponzi schemes among the most vulnerable affinity groups, and regulatory examinations should target those institutions with cultures most likely—as defined by their behavioral risk models—to violate key regulations.

In addition, the potential exists for regulators to pick up elements of culture from the corporations they regulate that can render them less effective, much like public health workers becoming infected with the disease they are fighting. In some cases, this leads to full-fledged regulatory capture, while in others, it merely leads to an inaccurate bill of good health. It is essential to the goal of regulatory efficacy that regulators remain immune to the values of other corporate cultures while maintaining a sufficiently deep working knowledge of them. This is easier said than done, but measurement of regulatory culture may be a starting point for identifying potential problems before they turn into more serious lapses.

These hypothetical examples show that culture can be a choice, not a fixed constraint. The emerging discipline of behavioral risk management can be the means by which a corporation's culture is measured and managed. And, thanks to advances in the behavioral and social sciences, big data, and human resources management, for the first time in regulatory history, we have the intellectual means to construct behavioral risk models. We just need the will to do so. To paraphrase Reinhold Niebuhr's well-known serenity prayer, the behavioral risk manager must seek the serenity to accept those parts of culture that cannot be changed, the courage and the means to change those parts of culture that can and should be changed, and the behavioral risk models and forensic studies required to distinguish one from the other.

REFERENCES

- Abbot, P. et al. 2011. "Inclusive Fitness Theory and Eusociality." *NATURE* 471, no. 7339 (March): E1–E4.
- Beck, U. 1992. *RISK SOCIETY: TOWARDS A NEW MODERNITY*. London: Sage Publications.
- Bénabou, R. J. 2013. "Groupthink: Collective Delusions in Organizations and Markets." *REVIEW OF ECONOMIC STUDIES* 80, no. 2 (April): 429–62.
- Bénabou, R. J., and J. Tirole. 2016. "Bonus Culture: Competitive Pay, Screening, and Multitasking." *JOURNAL OF POLITICAL ECONOMY* 124, no. 2 (April): 305–70.
- Boyd, R. 2011. *FATAL RISK: A CAUTIONARY TALE OF AIG'S CORPORATE SUICIDE*. Hoboken, N.J.: Wiley.
- Burns, M. P., and J. A. Sommerville. 2014. "'I Pick You': The Impact of Fairness and Race on Infants' Selection of Social Partners." *FRONTIERS IN PSYCHOLOGY* 5, no. 93 (February). doi:10.3389/fpsyg.2014.00093.
- Burns, N., K. Minnick, and L. T. Starks. 2013. "CEO Tournaments: A Cross-Country Analysis of Causes, Cultural Influences and Consequences," August 10. Available at SSRN: <http://ssrn.com/abstract=2261788>.
- Cohen-Cole, E., and J. Morse. 2010. "Your House or Your Credit Card, Which Would You Choose? Personal Delinquency Tradeoffs and Precautionary Liquidity Motives." Available at SSRN: <http://ssrn.com/abstract=1411291> or <http://dx.doi.org/10.2139/ssrn.1411291>
- Cohn, A., E. Fehr, and M. A. Maréchal. 2014. "Business Culture and Dishonesty in the Banking Industry." *NATURE* 516, no. 7529 (December): 86–9.
- Crémer, J. 1993. "Corporate Culture and Shared Knowledge." *INDUSTRIAL AND CORPORATE CHANGE* 2, no. 1: 351–86.
- De Nederlandsche Bank (DNB). 2009. "The Seven Elements of an Ethical Culture." Available at http://www.dnb.nl/en/binaries/The%20Seven%20Elements%20of%20an%20Ethical%20Culture_tcm47-233197.pdf.
- Deason, S., S. Rajgopal, and G. Waymire. 2015. "Who Gets Swindled in Ponzi Schemes?" Unpublished paper, Emory University, Goizeta Business School.
- Deng, Y., J. M. Quigley, and R. Van Order. 2000. "Mortgage Terminations, Heterogeneity, and the Exercise of Mortgage Options." *Econometrica* 68, no. 2 (March): 275–307.
- De Waal, F. 2006. *PRIMATES AND PHILOSOPHERS: HOW MORALITY EVOLVED*. Princeton, N.J.: Princeton University Press.
- Douglas, M., and A. Wildavsky. 1982. *RISK AND CULTURE: AN ESSAY ON THE SELECTION OF TECHNOLOGICAL AND ENVIRONMENTAL DANGERS*. Berkeley, Calif.: University of California Press.
- Durkheim, É. 1893. *THE DIVISION OF LABOR IN SOCIETY*. Trans. W. D. Halls, intro. L. A. Coser, 1997. New York: Free Press.
- Dyck, A., A. Morse, and L. Zingales. 2013. "How Pervasive Is Corporate Fraud?" Working paper, August.
- Eisenbach, T., A. Haughwout, B. Hirtle, A. Kovner, D. Lucca, and M. Plosser. 2015. "Supervising Large, Complex Financial Institutions: What Do Supervisors Do?" Federal Reserve Bank of New York *STAFF REPORTS*, no. 729, May. http://www.ny.frb.org/research/staff_reports/sr729.pdf.
- Elul, R., N. S. Souleles, S. Chomsisengphet, D. Glennon, and R. Hunt. 2010. "What 'Triggers' Mortgage Default?" *AMERICAN ECONOMIC REVIEW* 100, no. 2 (May): 490–4. Papers and Proceedings of the 122nd Annual Meeting of the American Economic Association.
- Fielding, E., A. W. Lo, and J. H. Yang. 2011. "The National Transportation Safety Board: A Model for Systemic Risk Management." *JOURNAL OF INVESTMENT MANAGEMENT* 9, no. 1 (First Quarter): 17–49.
- General Accounting Office (GAO). 1999. "Long-Term Capital Management: Regulators Need to Focus Greater Attention on Systemic Risk." GAO/GGD-00-3. October.
- Gibson, R., C. Tanner, and A. F. Wagner. 2015. "Do Situational Social Norms Crowd Out Intrinsic Preferences? An Experiment Regarding the Choice of Honesty." Swiss Finance Institute Research Paper no. 15-01, April. Available at SSRN: <http://ssrn.com/abstract=2557480>.
- Gordon, G. G., and N. DiTomaso. 1992. "Predicting Corporate Performance from Organizational Culture." *JOURNAL OF MANAGEMENT STUDIES* 29, no. 6 (November): 783–98.

REFERENCES (CONTINUED)

- Goodstein, R., P. Hanouna, C. D. Ramirez, and C. W. Stahel. 2013. "Contagion Effects in Strategic Mortgage Defaults." GMU Working Paper in Economics no. 13-07, January. Available at SSRN: <http://ssrn.com/abstract=2229054> or <http://dx.doi.org/10.2139/ssrn.2229054>.
- Government Accountability Office. 2013. "Securities and Exchange Commission: Improving Personnel Management Is Critical for Agency's Effectiveness." GAO-13-621. July.
- Graham, J., J. Haidt, and B. A. Nosek. 2009. "Liberals and Conservatives Use Different Sets of Moral Foundations." *JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY* 96, no. 5 (May): 1029-46.
- Greene, J. 2014. "Beyond Point-and-Shoot Morality: Why Cognitive (Neuro)science Matters for Ethics." *ETHICS* 124, no. 4 (July): 695-726.
- Guiso, L., P. Sapienza, and L. Zingales. 2006. "Does Culture Affect Economic Outcomes?" *JOURNAL OF ECONOMIC PERSPECTIVES* 20, no. 2 (Spring): 23-48.
- . 2013. "The Determinants of Attitudes toward Strategic Default on Mortgages." *JOURNAL OF FINANCE* 68, no. 4 (August): 1473-515.
- Haidt, J. 2007. "The New Synthesis in Moral Psychology." *SCIENCE* 316, no. 5827 (May): 998-1002.
- Hamilton, W. 1964. "The Genetical Evolution of Social Behavior. I and II." *JOURNAL OF THEORETICAL BIOLOGY* 7, no. 1 (July): 17-52.
- Haney, C., C. Banks, and P. Zimbardo. 1973a. "Interpersonal Dynamics in a Simulated Prison." *INTERNATIONAL JOURNAL OF CRIMINOLOGY AND PENOLOGY* 1: 69-97.
- . 1973b. "Study of Prisoners and Guards in a Simulated Prison." *NAVAL RESEARCH REVIEWS* 9: 1-17.
- Hermalin, B. E. 2001. "Economics and Corporate Culture," in C. L. Cooper, S. Cartwright, and P. C. Earley, eds., *THE INTERNATIONAL HANDBOOK OF ORGANIZATIONAL CULTURE AND CLIMATE*. Chichester, U.K.: John Wiley & Sons.
- Hill, C. A., and R. W. Painter. 2015. *BETTER BANKERS, BETTER BANKS*. Chicago: University of Chicago Press.
- Ho, K. Z. 2009. *LIQUIDATED: AN ETHNOGRAPHY OF WALL STREET*. Durham, N.C.: Duke University Press.
- Hodgson, G. M. 1996. "Corporate Culture and the Nature of the Firm," in John Groenewegen, ed., *TRANSACTION COST ECONOMICS AND BEYOND*. Boston: Kluwer Academic Press.
- Hunter, M., and N. C. Smith. 2011. *SOCIÉTÉ GÉNÉRALE: THE ROGUE TRADER*. Fontainebleau, France: INSEAD. Available at: <http://cases.insead.edu/publishing/case?code=26046>.
- Iyer, R., S. Koleva, J. Graham, P. Ditto, and J. Haidt. 2012. "Understanding Libertarian Morality: The Psychological Dispositions of Self-Identified Libertarians." *PLOS ONE* 7, no. 8: e42366, August. doi:10.1371/journal.pone.0042366
- Janis, I. L. 1982. *GROUPTHINK: PSYCHOLOGICAL STUDIES OF POLICY DECISIONS AND FIASCOES*. Boston: Houghton Mifflin.
- Kane, E. J. 2015. "Unpacking and Reorienting the Executive Subcultures of Megabanks and Their Regulators." Unpublished paper. Available at SSRN: <http://ssrn.com/abstract=2594923>.
- Knight, F. H. 1940. "'What Is Truth' in Economics?" *JOURNAL OF POLITICAL ECONOMY* 48, no. 1 (February): 1-32.
- Kreps, D. M. 1990. "Corporate Culture and Economic Theory." In J. E. Alt and K. A. Shepsle, eds., *PERSPECTIVES ON POSITIVE POLITICAL ECONOMY*. Cambridge: Cambridge University Press.
- Kroeber, A. L., and C. Kluckhohn. 1952. *CULTURE: A CRITICAL REVIEW OF CONCEPTS AND DEFINITIONS*. Cambridge, Mass.: Peabody Museum of American Archaeology.
- Kronman, A. T. 1983. *MAX WEBER*. Stanford, Calif.: Stanford University Press.
- Lazear, E. P. 1995. "Corporate Culture and the Diffusion of Values." In H. Siebert, ed., *TRENDS IN BUSINESS ORGANIZATION*. Tübingen, Germany: J.C.B. Mohr (Paul Siebeck).
- Lebow, C. C., L. P. Sarsfield, W. L. Stanley, and E. Etedgui. 1999. *SAFETY IN THE SKIES: PERSONNEL AND PARTIES IN NTSB AVIATION ACCIDENT INVESTIGATIONS*. Santa Monica, Calif.: RAND Corporation.
- Lo, A. W. 1999. "The Three P's of Total Risk Management." *FINANCIAL ANALYSTS JOURNAL* 55, no. 1 (January/February): 13-26.

REFERENCES (CONTINUED)

- . 2004. “The Adaptive Markets Hypothesis: Market Efficiency from an Evolutionary Perspective.” *JOURNAL OF PORTFOLIO MANAGEMENT* 30, no. 5 (Thirtieth Anniversary Issue): 15-29.
- . 2013. “The Origin of Bounded Rationality and Intelligence.” *PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY* 157, no. 3 (September): 269-80.
- Lowenstein, R.* 2000. *WHEN GENIUS FAILED: THE RISE AND FALL OF LONG-TERM CAPITAL MANAGEMENT*. New York: Random House.
- Lyng, S.* 1990. “Edgework: A Social Psychological Analysis of Voluntary Risk Taking.” *THE AMERICAN JOURNAL OF SOCIOLOGY* 95, no. 4 (January): 851-86.
- Milgram, S.* 1963. “Behavioral Study of Obedience.” *THE JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY* 67, no. 4 (October): 371-8.
- Nolder, C., and T. J. Riley.* 2014. “Effects of Differences in National Culture on Auditors’ Judgments and Decisions: A Literature Review of Cross-Cultural Auditing Studies from a Judgment and Decision Making Perspective.” *AUDITING: A JOURNAL OF PRACTICE AND THEORY* 33, no. 2 (May): 141-64.
- Nowak, M., and R. Highfield.* 2011. *SUPERCOOPERATORS: ALTRUISM, EVOLUTION, AND WHY WE NEED EACH OTHER TO SUCCEED*. New York: Free Press.
- Nowak, M. A., C. E. Tarnita, and E. O. Wilson.* 2010. “The Evolution of Eusociality.” *NATURE* 466, no. 7310 (August): 1057-62.
- Nuijts, W., and J. de Haan.* 2013. “DNB Supervision of Conduct and Culture.” In A. J. Kellermann, J. de Haan, and F. de Vries, eds., *FINANCIAL SUPERVISION IN THE 21ST CENTURY*. Berlin: Springer-Verlag.
- O’Reilly, C. A., and J. Chatman.* 1996. “Culture as Social Control: Corporations, Culture, and Commitment.” In B. M. Staw and L.L. Cummings, eds., *RESEARCH IN ORGANIZATIONAL BEHAVIOR* 18, 157-200. Greenwich, Conn.: JAI Press.
- Office of Personnel Management.* 2014. *2014 FEDERAL EMPLOYEE VIEWPOINT SURVEY: AGENCY RATINGS*. Accessed March 18, 2015. http://www.fedview.opm.gov/2014FILES/Global_Satisfaction_Index_Score_Trends_2014.xls.
- Pan, Y., S. Siegel, and T. Y. Wang.* 2015. “Corporate Risk Culture.” Unpublished paper. Available at SSRN: <http://ssrn.com/abstract=2675594>.
- Perrow, C.* 1999. *NORMAL ACCIDENTS: LIVING WITH HIGH-RISK TECHNOLOGIES*. Princeton, N.J.: Princeton University Press.
- Quercia, R. G., and L. Ding.* 2009. “Loan Modifications and Redefault Risk: An Examination of Short-Term Impact.” *CITYSCAPE* 11, no. 3: 171-93.
- Schein, E. H.* 2004. *ORGANIZATIONAL CULTURE AND LEADERSHIP*. San Francisco: Jossey-Bass.
- Securities and Exchange Commission (SEC). Office of Investigations.* 2009. *INVESTIGATION OF FAILURE OF THE SEC TO UNCOVER BERNARD MADOFF’S PONZI SCHEME*. Public version. Report OIG-509. August 31. Washington, D.C.: Government Printing Office.
- Securities and Exchange Commission (SEC).* 2014. *AGENCY FINANCIAL REPORT: FISCAL YEAR 2014*. Washington, D.C.: Securities and Exchange Commission.
- Shapira, Z.* 1995. *RISK TAKING: A MANAGERIAL PERSPECTIVE*. New York: Russell Sage Foundation.
- Shelp, R. K., and A. Ehrbar.* 2009. *FALLEN GIANT: THE AMAZING STORY OF HANK GREENBERG AND THE HISTORY OF AIG*. 2nd ed. Hoboken, N.J.: Wiley.
- Shiller, R.* 2005. *IRRATIONAL EXUBERANCE*. 2nd ed. Princeton, N.J.: Princeton University Press.
- Simon, H. A.* 1997. *ADMINISTRATIVE BEHAVIOR: A STUDY OF DECISION-MAKING PROCESSES IN ADMINISTRATIVE ORGANIZATIONS*. 4th ed. New York: Free Press.
- Smith, C. W.* 2005. “Financial Edgework: Trading in Market Currents.” In S. Lyng, ed., *EDGEWORK: THE SOCIOLOGY OF RISK TAKING*. London: Routledge.
- Snow, R.* 2013. *I INVENTED THE MODERN AGE: THE RISE OF HENRY FORD*. New York: Scribner.
- Société Générale.* 2008. “Mission Green: Summary Report.” English translation. Accessed September 20, 2014.

REFERENCES (CONTINUED)

- Sorensen, J. B.* 2002. "The Strength of Corporate Culture and the Reliability of Firm Performance." *ADMINISTRATIVE SCIENCE QUARTERLY* 47, no. 1 (March): 70-91.
- Steinberg, L.* 2008. "A Social Neuroscience Perspective on Adolescent Risk-Taking." *DEVELOPMENTAL REVIEW* 28, no. 1 (March): 78-106.
- Trivers, R. L.* 1971. "The Evolution of Reciprocal Altruism." *QUARTERLY REVIEW OF BIOLOGY* 46, no. 1 (March): 35-57.
- Valukas, A. R.* 2010. "Report of Anton R. Valukas, Examiner: Chapter 11, Case No. 08-13555 (JMP), In Re Lehman Brothers Holdings Inc., et al., Debtors." Volume 3. March 11. United States Bankruptcy Court, Southern District Of New York. Accessed September 23, 2014. <http://jenner.com/lehman/VOLUME%203.pdf>.
- Venkatesh, S. A.* 2006. *OFF THE BOOKS: THE UNDERGROUND ECONOMY OF THE URBAN POOR*. Cambridge, Mass.: Harvard University Press.
- Weeks, J.* 2004. *UNPOPULAR CULTURE: THE RITUAL OF COMPLAINT IN A BRITISH BANK*. Chicago, Ill.: University of Chicago Press.
- Wilson, M., and M. Daly.* 1985. "Competitiveness, Risk Taking, and Violence: The Young Male Syndrome." *ETHOLOGY AND SOCIOBIOLOGY* 6, no. 1: 59-73.
- Zhang, R., T. J. Brennan, and A. W. Lo.* 2014. "Group Selection as Behavioral Adaptation to Systematic Risk." *PLoS ONE* 9, no. 10: e110848. doi:10.1371/journal.pone.0110848.
- Zimbardo, P. G.* 2007. *THE LUCIFER EFFECT: UNDERSTANDING HOW GOOD PEOPLE TURN EVIL*. New York: Random House.

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