Volume 3, No. 2 | 2007

STANDARD &POOR'S

Greenwich Roundtable Quarterly

Exploring New Frontiers Of Investing

The Psychology Of Investing

Standard & Poor's
Greenwich Roundtable *Quarterly*

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ISSN 1557-2390

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The Psychology Of Investing

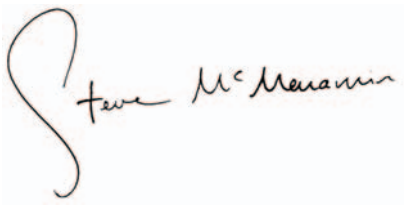
Inside this edition of the Greenwich Roundtable Quarterly we try to come to grips with the "soft" forces that influence market movements and investor actions. Greed and fear are no longer adequate explanations for all possible emotions experienced by market participants.

Behavioral finance is the psychology of financial markets. It has predictive qualities but they are not precise. It is not a moneymaking strategy but rather a framework whereby psychologists are better than economists in understanding how people deal with emotions. Behavioral finance also recognizes the need to fuse the interdisciplinary insights of economists, anthropologists, psychologists, sociologists, and historians.

Bob Shiller, the popular author and Yale professor, described "downward feedback loops" and the rise of the Internet as causing the crash of 2000. An amplification mechanism (the news media) was fundamental to this speculative bubble. His *Irrational Exuberance* described investors confusing their intuition with overconfidence. Dick Geist at Harvard was the first to isolate specific emotions. Anxiety is a very disruptive emotion. It changes our holistic way of decision making. Self-esteem influences our propensity to make mistakes. Feelings of injury lower our self-esteem, which causes us to react irrationally. The psychology of going against the crowd is contrarian investing. Peter Bernstein is a wonderful sage. He observed that being contrarian is very difficult for professionals to execute by themselves. David Swensen's portfolio was underwater for several years. He never fired his managers, managed to keep his own job, and later outperformed by a wide margin. The real hero was the Yale Investment Committee. It was the buffer between the administration, the alumni, and the appearance of imprudence. Being contrarian takes the courage to be wrong and alone for a long time. Mike Mauboussin is an original thinker who surprised us by claiming the crowd will outperform a vast majority of individuals, including experts. He also postulated that contrarian investing isn't about going against the grain; it's about exploiting expectations. Finally, he identified a new disorder—myopic loss aversion, the idea that the more frequently you assess your portfolio, the more likely you will see losses and feel a need to do something.

Once again I find myself writing about the late Hunt Taylor who recently passed in a tragic motorcycle accident. Hunt was obsessed with the role of emotion in the search for the "alternative alternative investment." Most of the sessions included in this edition were researched and moderated by Hunt. He always said that his due diligence process started by asking a hedge fund manager "where did you grow up…tell me about yourself."

Our mission at the Greenwich Roundtable is to educate sophisticated investors. We are devoted to education and best practices in the field of non-traditional investing.



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Emotions And Intelligence In Investing

Rising Above The Expectations Of The Unexpected

Joseph C. Becker, American Red Cross | July 26, 2006

I will address how the American Red Cross deals with risk and uncertainty. What are the stresses on the system and the stresses in the system? What is the uncertainty on the system and in the system?

The American Red Cross is not part of government, and typically not funded by the government, but works very closely with government. It is a non-profit that is in the government's response plan to a disaster. The Red Cross feeds, shelters, as well as other functions in the national response plan. It works with local, state, and federal government agencies, so we have a fairly good view of the system. I will speak more for the sector and less about our own specific organization when addressing the uncertainties.

Federal, state, county, and parish disaster response plans are written very generally. When you read these plans, you may wonder: "Is that all there is? Can't you be more specific?" That vagueness speaks to the uncertainty. We can not predict the specifics of a disaster scenario.

I believe what we count on is a leadership cadre that rises above plans, procedures, and rules to lead the country in times of response. We count on politicians to do the same.

What uncertainty or risk are we trying to mitigate? Obviously, it is the risk of non-performance. What if my phone does not work in a disaster? I will use the satellite phone. We have to keep asking the question in our planning, "What if that doesn't work?" In our world, you keep asking, "What's the next right answer?" You have to come up with a menu of responses, because any one could fail. In the 2005 hurricane season, most failed at any given time, particularly communications. You resort to putting people in a car and say, "Go tell John this." That is what you have to do when your systems fail.

Some of those uncertainties can be mitigated. Some we struggle to mitigate—we being the Red Cross or we being the country.

I will share a laundry list of those frightening things. What keeps a lot of very good people up very late at night worrying? In our world, given those probabilities and given the systems that have to respond, what might not work? What might happen in the system or to the system?

I start with what seems like a very obvious one: the first response community. What if they do not show up? What if the New Orleans police choose not to report for duty? In our world, our service is delivered by volunteers. What if the volunteers are frightened?

There is good data that first responders will respond even if they feel they are putting themselves in harm's way. You saw it firsthand on Sept. 11. I will rush in and I will do what I need to do. I will rise above my fears and respond. But we have not really experienced that on a large scale, for instance, in a chemical, nuclear, biological, or radiological event.

One of the things that we are deeply worried about is an influenza pandemic. What if the health professionals are frightened and will not respond?

One of the things that we are deeply worried about is an influenza pandemic. What if the health professionals are frightened and will not respond? What if they can not respond? So you have to ask: What is the next right answer? How do we structure systems to have redundancy built in so that we can respond some way?

I start with the people because they are first and foremost in our world. We have highly trained Red Cross volunteers who move around the country in times of disaster. There are about 52,000 of them: mental health professionals, case workers, people who run kitchens. You will always hear us say in the media: "We need volunteers." But we are not going to put you on a plane and fly you across

the country to go feed somebody. We will ask people from the community to do that.

Our bar was always Hurricane Andrew—it took 15,000 Red Cross workers and we thought that was big. Then we had hurricanes that hit Florida in 2004. That took 35,000 Red Cross workers and stressed us like never before. With Hurricane Katrina, we used 240,000 volunteers and more than half of those volunteers were not with the Red Cross before Katrina hit. Take spontaneous volunteers and put them to work—that is what is unique about America. We count on volunteers in time of disaster. Other countries do not necessarily do that.

The Red Cross has to review who is showing up to serve. Do you have people volunteering for the wrong reasons? Do you have people volunteering for personal gain? Do con artists show up? Now, we can do background checks in a matter of hours. We are trying to do background checks even for spontaneous volunteers, because we have to mitigate that uncertainty.

With Hurricane Katrina, we used 240,000 volunteers and more than half of those volunteers were not with the Red Cross before Katrina hit.

Our first area of risk or uncertainty is around the people. I do not think we know whether our first responders are going to show up in a large-scale nuclear or chemical attack when they are frightened. And it does not have to be the big one. We have hazardous material spills constantly. We had one in South Carolina not long ago. The first responders rushed in. They ended up in the hospital, too, because they did not know the situation. We worry about our people.

I would say second area of uncertainty is around whether or not our systems will work. I will give you an example from our organization. One of the things we do for people during disasters is give stuff away—diapers, bottled water, baby food—the things that people need. Those are the Red Cross trucks driving through neighborhoods. We are feeding people and giving stuff away.

There are some things that are better handled not with stuff, but with money: clothing where sizes matter or gas for the car. We give financial assistance to people. In the 2004 storms, we gave financial assistance to about 73,000 families. We tested our systems with helping 100,000 families. Are we ready? Are we ready to go? They passed the test and we felt good.

I have some vivid memories, obviously, of Katrina. One is of the damage assessment team that came to me the night the storm hit. They said: "Joe, you're not going to have 70,000 families that need assistance. It's going to be somewhere between 800,000 and 1.2 million."

We knew at that point the systems we had to give people financial assistance were not going to work. A volunteer in a high school gym working one-on-one with you was not going to get us where we needed to go to give people immediate emergency assistance. We would still be doing it if we used that system. The systems did not work.

So we called all the tech companies we could, brought them to Washington, D.C., and gave them three days and said, "We've got to create a new way to move money."

Nobody can move money better than Western Union, so we built call centers. But we had long lines because of the stress on the systems. The systems did not perform as expected because we did not build big enough.

I spent a lot of that day on the phone with our federal partners. We were still deeply concerned with how we were going to evacuate the Gulf Coast and Louisiana. We had hundreds of thousands of people with no way to get out of harm's way—living in Federal Emergency Management Agency trailer parks, for example. We had all kinds of planning assumptions about getting people out by bus and train. Taxpayer dollars are going to build great systems to do that, and the plans are incredible and quite thick. But they are all based on assumptions.

Where will the other people go when they evacuate? We have some history to refer to. They went to Texas. They went north. They went east. But where will they go next time? If those fundamental planning assumptions are wrong, the systems will not work. So we have to make sure we have got the flexibility and multiple assumptions. I have to tell you: as a sector we are not very good at that. We like to stick with the right answer. We like to come up with the assumption and then move. We have an assumption today that 255,000 people are going to require shelter if we evacuate southern Louisiana again. What keeps me up at night is that there are 165,000 shelter spaces in the state. So how do we get the people to Texas where we can provide for them?

We have a behavioral risk that is very difficult to mitigate. There are going to be eight fires tonight in New York City, on average, that will require the response of Red Cross volunteers. That is how we work: volunteers show up before the fire department leaves and we make sure the people have a place to stay. We make sure they are fed and have clothes on their back. We are meeting those immediate emergency needs.

The Red Cross has a congressional charter. What that means is that we do not pick and choose which disasters we show up at. We show up at a single-family home fire. We

show up at the big fires. We handle about 73,000 disasters a year, most of them single-family home fires.

If it is bigger than a single-family home or maybe an apartment fire, you will hear us talk about shelters. We put people in congregate shelters such as a high school gym or a church hall. And when you put 1,000 people in a big public building many stresses are present. Among them is uncertainty of what will happen next. Babies are born in shelters, but laws also are broken in shelters. People die in shelters.

We do what we can to mitigate these stresses, but there are trade offs we need to balance. We had heavily armed National Guardsmen patrolling the shelters in Louisiana last year. I am not sure we needed that, but we have to keep public order in a shelter. How do you keep order among people who are frightened and do not know how they are going to recover?

That relates to another uncertainty. How do we ensure that public officials, particularly elected public officials, say the right things and behave properly? Because what we have not seen yet, except on a small scale in New York City on Sept. 11, was public panic. What should the governor say? What should that mayor say? Who should be talking? Who should be keeping quiet?

That is what we are going to see in a chemical or nuclear attack. Am I supposed to stay home? Am I supposed to evacuate? Which way am I supposed to go? Love them or not, the media will play a huge role. The talking heads will be telling America something that might be different from what the governor just said, which may be different from what the mayor just said, which may be different from what the police chief just said. That is a huge risk for us.

And in Homeland Security and in Department of Health and Human Services, they have actually developed curricula for public officials on how to behave and what to say in a disaster. Not everybody last fall had taken the course. I think we paid a price for that, but I do not think we have seen it in a terror incident, and I think it is going to weigh very heavily on our country.

Assumptions that we make about people behaving according to predictions tie into that. I will give you a great example. We have a National Response Plan. The National Response Plan has a catastrophic supplement, which had an assumption in it that people would evacuate and we would build shelter capacity in concentric circles. So if New York City evacuates, how are we in Philadelphia? How are we in Washington, D.C.? How are we in Boston? What capacity do we have? Because people are going to evacuate in concentric circles

When we evacuated New Orleans, people went everywhere, not in concentric circles. We sheltered in 26 states and served people in 49 states and Puerto Rico. People did not go where they were supposed to go. They went home to mom. They went to dad. They went to relatives. They went where somebody would take them. It blew all the assumptions of the catastrophic supplement of the National Response Plan. So the plan is being rewritten.

> We need, as a country, to apply better thinking. We did not imagine well. Our organization imagined too small.

We have to ask ourselves: did we imagine well? Not only in relation to scenarios, but did we imagine the impact on people? We take part in a lot of federal, state, and local drills. The drills last about three days. You wait until they catch the bad guys, they open the roads, and the drill is over. You do not really think about what a family is going to go through for the next six months. What is a family going to go through for the next three years? We do not imagine the impact on people well.

One of the things we recognize is that nobody has a better imagination in our country than Hollywood. We are starting to engage Hollywood in scenario planning. Give me another movie idea about what the bad guys are going to do next?

We need, as a country, to apply better thinking. We did not imagine well. Our organization imagined too small. We sheltered fine. We fed fine. But when it came time to give the financial assistance to people, our systems were not ready. Our IT systems started to collapse and we had to create new ones on the fly. We did not imagine big enough.

In the non-profit sector we do not know the high end of how much America will give in response to a disaster. The most expensive natural disasters the Red Cross ever responded to were the four hurricanes in Florida in 2004. It cost us $127 million.

Another one of my vivid memories from Katrina was meeting with President George Bush and saying: “We have about a million families. If we give each one $1,000 in financial assistance average, that part of our work alone is going to cost $1 billion. This thing could cost $1.5 billion or $2 billion.” And our fund that responds to disasters had about $40 million.

Could we afford to do what we do? The conversations went late into the night and early into the morning. Can we afford to do it? I remember Bob McDonald, CFO of the American Red Cross, scrambling to line up a $1 billion line of credit for the Red Cross. I remember borrowing hundreds of millions of dollars, trusting that America was going to give us the money. And America did. By February we had the $2.1 billion that we

spent on Katrina. But what if it had cost $4 billion? What if it had cost $6 billion? We do not know the upper limit. That is a fear we have. That is a risk we have.

I will close with an observation. We have a lot of wonderful, very talented people working on our country's disaster-response system. One of the biggest lessons our organization learned last fall was that we need people from outside of our system studying our system. We need Hollywood's imagination. We need people like you making predictions and applying them to our sector—not just the non-profit sector, but the government sector. How do we bring that thinking to the system?

I have a challenge for you. Part of what makes first response incredibly difficult or incredibly easy are the people that we serve. Do they know what they need in a disaster?

Despite a lot of money and a lot of effort, we are right where we were post-Sept. 11. No more families have an emergency kit or plan today than after Sept. 11.

Are they sitting there saying: "What are they going to do for me next? How are they going to get me out of here? How are they going to feed me? How are they going to care for me?"

How many families in this country have a disaster plan? How many families have a kit that they can grab and throw in a car and go? How many families know what they are going to do? Despite a lot of money and a lot of effort, we are right where we were post-Sept. 11. No more families have an emergency kit or plan today than after Sept. 11.

So my challenge to you is: I know you will take care of yourself, but do you have a kit? Do you have a plan? Do you know what you are going to do? Do your families and the people that you love have a plan? I think that is very important. ●

Joseph C. Becker is the senior vice president of preparedness and response for the American Red Cross, a human service organization founded in 1881. The American Red Cross is dedicated to providing relief to victims of disasters and helping people prevent, prepare for, and respond to emergencies. Mr. Becker leads the organization's disaster preparedness and relief, as well as its services to the military and their families. Mr. Becker joined the national headquarters staff on Jan. 1, 2004, as the vice president of response. Before assuming this role, he was the executive director of the Greater Carolinas Chapter of the American Red Cross starting in February 1997. His Red Cross involvement started much earlier as a member of the chapter Board of Directors from 1992 to 1996.

Prior to his employment with the Red Cross, Mr. Becker was part of the management group of Kings Entertainment Co., which had five regional theme parks in the U.S. and Canada. Kings Entertainment was acquired by Paramount in 1992. At the end of his 23-year career with the company, Mr. Becker was the vice president of operations at Paramount's Carowinds.

Born and raised in Cincinnati, Ohio, Mr. Becker received a degree in business administration from Miami University in Oxford, Ohio in 1979.

Non-Linear Systems And The Lack Of Proportionality

Michael Mauboussin, Legg Mason Capital Management | July 26, 2006

I would like to break my comments into three parts. First, is to underscore the classic distinction between risk and uncertainty. I believe this distinction remains very useful today, especially when thinking about managing risk. Second, there are some mechanisms behind risk and uncertainty. I am going to place a particular emphasis on differentiating between complex systems where risk or uncertainty is endogenous, which is internal to the system, versus situations where risk is exogenous, or external to the system. Finally, is to share some thoughts about managing risk, including a brief look at probability assessment.

In our day-to-day language, and certainly in the world of finance, people tend to use the terms "risk" and "uncertainty" interchangeably. But in the 1920s an economist, Frank Knight, made a distinction I still find very useful. He argued that risk describes a system where we do not know what the outcome is going to be, but we do know what the underlying probability distribution looks like. You can imagine a roulette wheel. When the croupier spins the wheel and drops the ball, you do not know where the ball is going to land, but you know every possible outcome and its associated probability. Risk also typically incorporates the notion of harm, meaning you can lose—there is some downside.

In contrast, uncertainty reflects a situation where you do not know what the outcome is, but you also do not know what the underlying distribution looks like. Uncertainty also does not necessarily imply harm, although it often includes a notion of harm.

So it is not difficult to see that most of the systems we deal with are really uncertain and not necessarily risky. Uncertainty definitely describes things like terrorism, the avian flu, or even the markets.

> When we discuss risk or uncertaintly, we are not really interested in the boring events, like the market going up a little or a rain shower. What we are interested in, of course, are the extreme events.

Now, here is why I am stressing this distinction. We can model risk using probability calculus. In fact, the statistics of risk are relatively straightforward. In contrast, we can not model uncertainty very easily. The real trouble arises when we model uncertain systems using the mathematical tools of risk. Yet, for the most part, this is precisely what we do in the financial markets and other domains. We will return to this issue of risk and uncertainty in quantification later.

Let me now turn to the second topic. Over the past decade or so I have had the pleasure to be affiliated with the Santa Fe Institute (SFI), which is a multidisciplinary research institute dedicated to the study of complex systems.

My interaction at SFI with scientists, including physicists, biologists, and network theorists, has encouraged me to think much more about the mechanisms behind risk and uncertainty. To be frank, these mechanisms can really only describe what is going on; they are still of limited predictive value. But I think these mechanisms provide insights into how these systems work and how we might think about dealing with them.

Let me be very clear about a point. When we discuss risk or uncertainty, we are not really interested in the boring events, like the market going up a little or a rain shower. What we are interested in, of course, are the extreme events: the stock market crashes and the devastating hurricanes. So the real question is: how do these extreme events come about?

A distinction I find useful is between endogenous and exogenous sources of risk. As the word implies, endogenous means it rises within the system. Endogenous risk is inherent in a complex system, yet it remains poorly understood.

Exogenous risk comes from outside the system. It is basically a condition imposed on the system. I think a lot of things the American Red Cross deals with, for example, would be exogenous factors. By its nature, exogenous risk is an interdisciplinary topic.

When you take away diversity, the system becomes fragile and in some cases will lead to large-scale changes and disasters.

The first structure in the framework is the wisdom of crowds. That is an idea that the writer Jim Surowiecki laid out a couple years ago in his book "*The Wisdom of Crowds*." The basic idea of the wisdom of crowds is simple but very counterintuitive for people. That idea is that if you get a diverse group of people together to solve a problem, the group's answer will typically be better than that of any individual or even any expert of that system.

The wisdom of crowds is a more common way of describing complex adaptive systems, which are at the heart of the SFI's work and a very apt description of the stock market. The key is: the crowd is only wise when there is diversity. When you take away diversity, the system becomes fragile and in some cases will lead to large-scale changes and disasters. Booms and crashes are a great example of diversity breakdowns in markets. Fads and fashions are examples in the real world, and that all leads to the second leg of the framework, which is diffusion theory.

Technologies, ideas, and illnesses all tend to diffuse following an S-curve pattern, which you have seen at some point. For example, a new technology will start off with a few adopters. It will grow at a relatively slow rate early on. Then the rate accelerates to some degree and the technology starts to take off. Once the demand for the technology is saturated, the growth rate slows again. This is a field that has been studied in some detail and is of prime interest to epidemiologists and technologists, just to name a few. The key is that the growth rate is not stable. It starts slow, accelerates, and then slows down again.

It also is important to note that most technologies, ideas, or fads do not diffuse. They imply sputtering out before getting to that key point. That leads to the third and final leg of the framework; network theory, which is about how the individual nodes in a network are connected. Network theory bears on a wide variety of phenomena, including networks of friends, business associates, power transmitters, or disease. In recent years, scientists have made major advances in understanding the nature of networks. We now know how the structure of a network is very important to understanding how things get transmitted over that network.

There are two key features of all these frameworks. First, these are non-linear systems. For example, in the case of the wisdom of crowds, you can reduce the diversity and nothing happens. Then you reduce the diversity just a bit more and the system reacts violently. It is the proverbial straw that breaks the camel's back. Malcolm Gladwell popularized it: the tipping point.

This leads to the second feature, which is a lack of proportionality. The size of the perturbation and the outcome are not always linked to one another. Sometimes you have small perturbations that lead to very large outcomes, and vice versa. When you combine a lack of linearity and a lack of proportionality, it is not hard to see that predictions are very difficult to make, and cause and effect thinking is often futile.

An example of this is the Long-Term Capital Management (LTCM) fiasco. The firm used statistical arbitrage to vacuum up nickels, as Myron Scholes described it. One essential component of its portfolio was that it was highly diversified. LTCM calculated that the correlations between its positions were historically quite low—10% correlations or less.

Now, to be conservative in its value-to-risk models, LTCM assumed correlations that could jump up to 30%, which was vastly higher than anything ever seen in its historical data. However, in the summer of 1998 we saw a real contagion—a diversity breakdown of epic proportions. Notwithstanding the substantial arbitrage opportunities that existed, there were no arbitrageurs to be found at that time, and correlations rocketed higher. As it turns out, the correlations for LTCM got to 70%. Add correlations that are high, leverage, and declining asset prices, and you have the story in a nutshell.

Another example is the large East Coast blackout in August 2003. The blackout started with a fairly routine power problem in Ohio. In fact, it was a problem that happens pretty regularly all over the country. It was a fairly unremarkable beginning. Since our national power grid is on a network, a failure in one spot is typically absorbed by the neighboring node, so such a problem is usually not a big deal.

In 2003, Ohio had a problem that meant it required energy from Michigan. But Michigan had a slight problem that day as well. It could not handle it, so it demanded power from Canada. Canada could not handle that demand either, so Canada went to New York State and we had this cascading effect. All along the chain things got worse until we ended up with that widespread breakout. It was a classic example of a cascading failure.

Now here are just a couple points to make on these examples. First, the outcomes in both instances were grossly out of proportion with the perturbation. In both cases there were real issues that triggered the events, but the catalysts were not out of the ordinary, only the outcomes. The second point is actually very important from a psychological perspective, and it is also true of the crash of 1987. After the events, people automatically seek to understand the causes and effects and try to fix the problem. As I previously mentioned, there is no easy way to understand cause and effect in these types of systems, and these behaviors, these patterns, are part and parcel to complex systems.

As long as these systems exist, we are going to suffer periodic catastrophic failures. Now, the good news is these systems bring a lot of value to society. They are good ways to solve lots of problems.

The other kind of risk, which I will not touch on in much detail, involves factors that are exogenous. Examples include the threat of avian flu, terrorism, and hurricanes, just to name a few. Each is a complex system. We can often think of these things as happening to us, rather than arising from our day-to-day activities.

What shall we do about all this? Here are some thoughts. A couple of them are constructive, while some of them not so constructive or concerning. On the constructive side, it is useful to note that the outcomes of complex systems often have a statistical signature, and that is a power law distribution. Now a power law, which is colloquially known as the 80-20 rule, says that large events happen infrequently and small events happen very frequently. What is elegant about power laws in particular is that there is a specific mathematical formula that it can express that relationship.

What is elegant about power laws in particular is that there is a specific mathematical formula that it can express that relationship.

Power laws describe a wide range of phenomena, from the number of deaths in wars over history, to earthquakes, to the size of blackouts, to stock price changes, to city sizes, to the metabolic rate of animals. Awareness of these statistical properties, even though they may have limited predictive ability, is very useful.

Next on the constructive side, we have so-called prediction markets. For those who have not seen these, I would strongly encourage you to do a little dive into this area: decision markets or prediction markets. These things can at least help us assess the probabilities of various events. We would ideally have done this as a survey, but I am going to give you some statistics on this. Let me just read off some of the probabilities I found on prediction markets this morning. These are real markets, real dollars changing hands, predicting specific events.

The first was the probability of a confirmed case of human H5N1 virus—the avian flu—occurring in the U.S. by the end of this calendar year. The probability for that is 33%. The probability of a confirmed case in the EU before a case in the U.S. is 88%. So there is a sense it is going to happen in

Michael Mauboussin joined the Legg Mason Capital Management as chief investment strategist in March 2004. Prior to joining Legg Mason, he served as managing director and chief U.S. investment strategist at Credit Suisse First Boston. He joined CSFB in 1992 as an analyst of the packaged food industry.

Mr. Mauboussin is a former president of the Consumer Analyst Group of New York. He co-authored *Expectations Investing: Reading Stock Prices for Better Returns*. He was repeatedly named to *Institutional Investor*'s All-America Research Team and the *Wall Street Journal* All-Star survey in the food industry group. *SmartMoney* magazine has named him as one of its Power 30, a list of "the most influential people on Wall Street."

Mr. Mauboussin received his B.A. from Georgetown University. He is an adjunct professor in finance and economics at Columbia Business School, and serves on the board of trustees of the Santa Fe Institute, a leading center for multidisciplinary research in complex systems theory.

Europe first. The probability of an avian flu vaccine by the end of this year—it did not specify the efficacy of that—was also 33%. The probability of an Islamic terrorist attack on U.S. soil prior to the end of President Bush's term: 54%. The probability of a terrorist act in the EU before it happens in the U.S. is 69%. The probability of nine of more Atlantic hurricanes in the 2006 hurricane season: 43%.

Now, naturally, some understanding of the distributions and probabilities allows for some form of insurance or preparedness to protect against one or more of these events. But if you ask the average American if he or she is worried about the avian flu this year, I suspect no one would guess that it is a one-third probability, at least as suggested by this market.

This all leads to my final thought, which is not an optimistic thought. Psychologists have demonstrated events that are not vivid in our minds get assigned very low probabilities, much lower, in fact, than the facts warrant. So I suspect for us to mobilize as a society to address risks like global warming or energy constraints, we are going to need another tragic, Sept. 11-type event that reveals what is really going on.

In summary, I just want to leave you with a notion that we humans are still not very good at dealing with risk or uncertainty. We are still linear thinkers. We have a nearly insatiable need to link cause and effect, and we assess probabilities poorly. Unfortunately, we live in a world that is largely comprised of a bunch of complex systems. However, the good news is we now better understand some of the mechanisms that underlie these complex systems. That knowledge can be very helpful in preparation for future catastrophic events. ●

The Nature And Nurture Of Those Who March To Their Own Beat

Peter Bernstein, Peter Bernstein, Inc. | Feb. 24, 2005

John Cochran, a professor of finance at the University of Chicago Business School, said, "the classic theory of finance (the efficient market hypothesis) has no volume at all. Prices adjust until investors are happy to continue doing what they were doing all along—holding the market portfolio."

The classic theory of finance predicts that the NYSE and NASDAQ do not exist. These markets are at the bottom. They are markets of information—or some might say opinion—not really markets for stocks and bonds. If we were not trading information, we would not be trading. If prices immediately reflected all available information, there would be no trades. But because they do not, the whole thing ticks.

The title of my talk really should be "The Nature and Nurture of Contrarian Investors." I want to emphasize the "nurture" part. This is a process that is very difficult for professionals to execute by themselves. The client-manager relationship is critical to this process.

By contrarian, I mean earning alpha by going against the crowd—beta is what the crowd is doing. Beta is a benchmark risk. It exists in a lot of places where we do not officially recognize it. When a lot of different managers start following the same strategies, what was originally an alpha strategy then becomes a beta. Cliff Asness, managing and founding principal of AQR Capital Management, pointed this out and it is very important to keep in mind.

If you are investing in the same thing as other people, you are part of the crowd. This is true even if it is not an officially named asset class and even though you may be beating the S&P 500 index or some other benchmark. In the end, you are involved in beta risk and you have to outperform that group before you really have alpha—before you are really a contrarian.

Alpha comes only from strategies that break away from a benchmark, that take the risk of tracking error. Alpha means that you have to take the risk of being wrong and alone more often than other managers. It also means that you will have higher volatility than the benchmark. It is a lonely business, and if it is not lonely, you are probably not being a contrarian investor—you are going with the crowd.

Alpha comes only from strategies that break away from a benchmark, that take the risk of tracking error. Alpha means that you have to take the risk of being wrong and alone more often than other managers.

To illustrate that nurture is as important as the talent involved, I will use an example of a money manager and a client.

The manager, Bill Miller, runs Legg Mason's Value Trust Fund and has beaten the S&P 500 for 14 consecutive years. Bill has an alpha of 3.1 and he is measured against the large varied group that has an alpha of negative 0.5. His mean returns and his Sharpe Ratio are double the group's average, and he has beaten the S&P by 573 basis points per year versus negative 169 basis points by the group.

The interesting part is how he achieved this success. He is a very thoughtful and well-organized man, but he took risks. He has a beta of 125, whereas these benchmark followers have beta of 94. He has a standard deviation of returns of 22.6 versus 15 from the other group. He has had a 14-year run of calendar out-performance, but the streak is just luck. As Stephen J. Gould said, "streaks are luck imposed on skill." He has lagged the S&P 500 25% of the time. He was not beating it every day. He achieved this against two major drags. One is an expense

ratio of 1.75, which is about double or more what the Vanguard funds show, and the second is $10 billion in assets, which is not very easy to move around. Nevertheless, he has a turnover rate of 2% last year against 75% for his group.

The client is the Yale University Endowment Fund managed by David Swenson. When Swenson took over this job in 1985, he took the usual 60% equity/40% fixed-income portfolio. Within a few years, he had transformed it into something that did not look conventional at the time. In his book, *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment*, he wrote "active management strategies demand un-institutional behavior from institutions, creating a paradox that few can unravel. Establishing and maintaining an unconventional investment profile requires acceptance of uncomfortably idiosyncratic portfolios that frequently appear downright imprudent in the eyes of conventional wisdom."

Establishing and maintaining an unconventional investment profile requires acceptance of uncomfortably idiosyncratic portfolios that frequently appear downright imprudent.

For example, Yale's U.S. equity component was around 60% when Swenson took over and it is now about 20%. It is frequently under 20% of the total portfolio, which in itself is unorthodox. Swenson retains a small number of managers, most of whom are not big name people. Each is highly specialized with concentrated portfolios, some with as few as four positions in the portfolio. In December 1994, this portfolio was worth $800 million and it began to lag its benchmark. By January 1999, the portfolio was $295 million and under water. Three years later, at $1.154 billion, it was almost $700 million ahead of the benchmark. Thus, it was enormously ahead, but it had been under water for a period of years. But not one manager was fired and not one manager was changed. Swenson kept his job. The managers kept their jobs. It was very important that Swenson had the faith of the managers and that the investment committee had the faith in Swenson.

What happened to Bill Miller during the down years is in some ways even more dramatic. Between 1999 and 2002, Bill lost $5.3 billion in assets and the account shrank by about 40% in value. The market value went down almost as much as the S&P 500—about 30%. Withdrawals made the difference. Bill did not have totally steadfast clients in his fund. There were withdrawals because he had an open-ended structure. He lost about a billion dollars, but then everybody else stayed in.

What would have happened to Miller's fund in those years if he had just started in the industry, or if his previous years had not been so good? Building up a good track record in the beginning is essential if you have an open-ended or a one-year renewal arrangement with clients, because they will be willing to stick with you much longer.

Now consider Swenson. Miller has thousands of shareholders. Swenson has one—the Yale University Investment Committee. Lurking behind the committee are

Peter Bernstein is the founder and president of Peter L. Bernstein, Inc., established in 1973 as economic consultants to institutional investors and corporations. He writes and publishes an analysis of the capital markets and the real economy, *Economics and Portfolio Strategy.* A Harvard graduate and former member of the research staff of the Federal Reserve Bank of New York, Mr. Bernstein was an Air Force captain, serving in OSS (Office of Strategic Services) in World War II. In 1951, after teaching economics at Williams College, he joined a nationally known investment advisory firm where he managed large individual and institutional portfolios. For many years he taught as an adjunct professor of the Graduate Faculty of the New School in New York. Mr. Bernstein was the first editor of *The Journal of Portfolio Management,* and is now its consulting editor. He lectures widely throughout the U.S. and abroad, and has authored 10 books, the most recent of which are *Capital Ideas Evolving*; *Wedding of the Waters: The Erie Canal and the Making of a Great Nation; The Power of Gold: The History of an Obsession; Against The Gods: The Remarkable Story of Risk;* and *Capital Ideas: The Improbable Origins of Modern Wall Street.* In 1997, Mr. Bernstein received the Association for Investment Management and Research's (AIMR) highest award for professional excellence, the Graham and Dodd Award for Excellence in Financial Writing in 1998 and 2003, and most recently AIMR's James R. Vertin Award for highest quality research of lasting importance.

the administration and a lot of fat-cat alumni givers with fat pockets but short attention spans. We know from the Harvard experience what kind of pressures those kinds of people can bring on the performance of a portfolio.

Swenson had very little wiggle room compared to Miller because of this kind of one-client background. He was brave, he was bold, he was creative, and he was imaginative. But to me, the real hero of this story is the Yale University Investment Committee because it was the buffer between Swenson and the administration and the alumni. It was the one that gave him the stiff back to keep going when the going was rough. He could not have done what he did without that kind of committee.

The dynamics of that relationship is very strange, critical, and important. If you can not manage the relationship correctly, you can not manage the portfolio. It does not matter how much skill is brought into the business. If you do not have the right kind of relationship with the clients, or the right kind of clients who will stay during the periods when you are running it alone, this is no game to be played.

If you are going to be a contrarian investor, you must have the courage to be wrong and alone for extended periods of time.

There are some very simple conclusions from my examples, but they are worth repeating every day. If you are going to be a contrarian investor, you must have the courage to be wrong and alone for extended periods of time. You must have unshakable support from clients or some kind of a lock-up agreement. I am a believer in having closed-end investment companies that provide full freedom of action and that having this unshakable support is just as important as being smart and being courageous. ●

When The Gap Between Fundamentals And Expectations Warrants The Bet

Michael Mauboussin, Legg Mason Capital Management | Feb. 24, 2005

In addressing this topic, I'd like to make three points: First, I will try to define what contrarian investing means; at least I'll try to offer one way to think about it. This part will define one of the hardest parts of investing and one of the most common errors: a failure to distinguish between fundamentals and expectations.

Second, I'll spend a few moments on market efficiency, a terribly important issue that most active managers don't seem to think about much. This section will propose some ideas on how and why markets are efficient, which will lead us to a discussion of how and why markets periodically become inefficient.

Finally, I'd like to touch on why it's so hard to be a contrarian investor. I will argue that there are two types of constraints: institutional and psychological. Clearing either one of these hurdles is difficult for an investor; clearing both is nearly impossible.

Let me start with an obvious statement: the simple act of being a contrarian will make no one rich. In fact, conforming generally makes the most strategic sense. If you're in a movie theater that catches on fire, you'd be best served to run out of the theater in contrast to the contrarian tack to run into the theater.

This point may seem trivial, but it has very deep-seated psychological roots. Many survival strategies in the animal kingdom rely on cooperation. One simple example is flocking—schools of fish or flocks of sparrows act in unison to minimize the threat of a predator.

If being different—not conforming—is not the sole goal, what should the aspiring contrarian focus on? Here I turn to a common sense distinction that I would argue is the single most common error in the investment business: failure to distinguish between the fundamentals of the situation (for example, the fundamentals of a company in the case of stocks) and the expectations reflected in the asset price.

Horse racing provides a good metaphor for this distinction. There are two issues: how well the horse will likely run—to figure out the fundamentals you'd look at the horse's record, the stable it came from, the jockey, the track conditions, etc.—and the expectations, which show up as the odds posted on the board.

A contrarian investor focuses not only on the general sentiment, but more importantly on how that sentiment can lead to disconnects between fundamentals and expectations.

Evidence shows that horse racing is a pretty efficient market. According to "The Economics of Wagering Markets" in the *Journal of Economic Literature*, Prof. Ray Sauer of Clemson University concludes that "prices set in these markets to a first approximation are efficient forecasts of outcomes."

A contrarian investor focuses not only on the general sentiment, but more importantly on how that sentiment can lead to disconnects between fundamentals and expectations.

To continue with the horseracing theme, I'd like to read a quotation from Steven Crist, now chairman of the *Daily Racing Form* and for many years the *New York Times* reporter covering horse racing. Crist contributed a chapter to a book called *Bet with the Best*. Crist's 13-page chapter "Crist on Value" is fabulous reading and stacks right up against Warren Buffett and Ben Graham.

Here's Crist's comment, and please mentally strike out "horse" and insert "stock":

"The issue is not which horse in the race is the most likely winner, but which horse or horses are offering odds that exceed their actual chances of victory…This may sound elementary, and many players may think that they are follow-

ing this principle, but few actually do. Under this mindset, everything but the odds fades from view. There is no such thing as 'liking' a horse to win a race, only an attractive discrepancy between his chances and his price."

The successful hedge fund manager, Michael Steinhardt, shared a very similar view in his 2001 autobiography *No Bull: My Life In and Out of Markets*. He states: "I defined variant perception as holding a well-founded view that was meaningfully different than the market consensus…Understanding market expectation was at least as important as, and often different from, the fundamental knowledge."

Now ask yourself, very honestly, how clearly do you distinguish between fundamentals and expectations? If you're like most people, not very clearly. I quote a psychologist Robert Zajonc from *Feeling and Thinking: Preferences Need No Inferences*, who sums it up pretty well:

"We sometimes delude ourselves that we proceed in a rational manner and weigh all of the pros and cons of various alternatives. But this is seldom the actual case. Quite often 'I decided in favor of X' is no more than 'I liked X'… We buy the cars we 'like,' choose the jobs and houses we find 'attractive,' and then justify these choices by various reasons."

Moreover, what we like is heavily influenced by what other people like. Successful contrarian investing isn't about going against the grain per se, it's about exploiting expectations gaps. If this assertion is true, it leads to an obvious question: how do these expectations gaps arise? Or, more basically, how and why are markets inefficient?

In his excellent book, *Inefficient Markets*, Harvard Prof. Andrei Shleifer summarizes the three arguments that underpin the efficient market hypothesis (EMH):

- Investors are rational, and value securities rationally. This is the basis for so-called general equilibrium models;
- Investors are not rational, but their errors are independent, and hence cancel out, leaving us with an "efficient solution;" and
- The no-arbitrage assumption—even if some investors are irrational, rational arbitrageurs swoop in and eliminate those inefficiencies.

The burgeoning behavioral finance field takes aim at the efficient market hypothesis, focusing it's efforts on undermining number one, the rational agent model, and number three, the no-arbitrage assumption. By and large, though, behavioral finance dismisses the second alternative out-of-hand. We'll come back to that in a moment.

Successful contrarian investing isn't about going against the grain per se, it's about exploiting expectations gaps.

No one really believes the rational agent model any more—or at least no one takes it too literally—although it does provide some very elegant solutions. The main focus of the behavioral finance attacks on EMH has been on the limits to arbitrage—that since arbitrage is nowhere close to costless, riskless, and there are no perfect substitutes—many inefficiencies exist—even if they can't be exploited profitably.

Let's revisit the second way to achieve market efficiency—the interaction of heterogeneous investors. Over the past 20 years some important developments occurred in this area, generally put under the larger rubric of "complex adaptive systems." Complex adaptive systems are ubiquitous, and have some common features:

- The system starts with a group of heterogeneous agents, be they ants, or cells, or investors;
- The agents interact, leading to a feature called "emergence;" and
- A global system results.

Importantly, the features and attributes of the global system are distinct from the underlying agents. The sum is greater than the addition of the parts. Reductionism doesn't work; you can't understand the global system by understanding each individual part.

A classic example of a complex adaptive system is an ant colony—study the system at the colony level and you will observe an adaptive and robust system with a life cycle vastly beyond the lifespan of any ant. But interview the individual ants and they will have no idea what's going on at the global level—they operate with local information and local interaction.

We can easily view the stock market as a good example of a complex adaptive system. You have investor diversity—growth versus value, long-term versus short-term, fundamental versus technical, and tips from Uncle Bob. You have an aggregation mechanism called the stock exchange, and you have a global system, or output, in stock prices.

But not all is perfect in complex adaptive system land. You need certain conditions in place for efficiency to prevail. We believe these conditions are:

- Agent diversity,
- An aggregation mechanism, and
- Incentives.

Jim Surowiecki deftly articulated this line of thinking in his delightful book, *The Wisdom of Crowds*. Surowiecki argued that when these conditions are in place, the crowd will outperform a vast majority of individuals, including

experts. Perhaps I can put this more bluntly: When these conditions are in place, markets are efficient.

Just to close the loop on behavioral finance, some critics claim investors are not diverse because they make errors in exactly the same way. About investor diversity, Prof. Shleifer writes in his book *Inefficient Markets* that "it is this argument that the Kahneman and Tversky theories dispose of entirely." I don't know if Prof. Shleifer has spent much time with real investors, but to suggest they all act in concert all the time presses the limit of credibility.

If markets are efficient when these conditions prevail, when do they become inefficient? The answer, I believe, is when one of the three conditions is violated. By far the most likely is investor diversity.

We know from studying social psychology that diversity breakdowns occur periodically. As humans, we like to belong to the group, but we're willing to join in with the group to varying degrees: more formally, we all have different adoption thresholds.

The one point I'll add, but won't develop, is that these systems are non-linear. They are subject to critical points. So you can see diversity breakdowns start but without any notable influence on prices. Then, there's the proverbial "straw that broke the camel's back" and the system changes states very quickly.

Returning to the power of being part of the group, psychology Prof. Solomon Asch performed a series of experiments at Yale in the 1950s. Asch's experimental groups had eight members—seven were in on the experiment and the eighth was the subject. Each member of the group had to identify which line (of three choices) was of the same length as the sample line. The task was very simple, and in trial runs subjects effectively got 100% correct.

Asch then signaled the seven in the know to offer wrong answers. Thirty-five percent of the subjects went with the majority, even when the answer was obviously wrong! [7]

If markets are efficient when these conditions prevail, when do they become inefficient? The answer, I believe, is when one of the three conditions is violated. By far the most likely is investor diversity.

So the key is to find diversity breakdowns and make sure the "odds" compensate you for the risk you are assuming. Neither of these tasks is easy.

There is no doubt that diversity breakdowns occur. This means stock market risk is endogenous and exogenous. Still, diversity breakdowns are more the exception than the rule.

Ned Davis's book, *The Triumph of Contrarian Investing*, offers a host of indicators that help identify sentiment extremes, or diversity breakdowns.

One of my favorite examples is called the "Curse of Lyford Cay." For the past 20 years or so, Morgan Stanley has hosted a conference of the smartest investors around to discuss markets and stocks. Barton Biggs, the long-time head of strategy at Morgan Stanley, noted that the Lyford Cay consensus often proved to be a great signal to bet the other way. For example, the overwhelming majority of investors in late 2003 felt that rates were going higher in 2004. When the dust settled in 2004, yields on the 10-year government note were actually lower.

Even if you've accepted my arguments up to this point, you might ask why don't more people try to do this? In this case, two significant types of constraint act on investors.

Michael Mauboussin joined the Legg Mason Capital Management Group as chief investment strategist in March 2004. Prior to joining Legg Mason, he served as managing director and chief U.S. investment strategist at Credit Suisse First Boston. He joined CSFB in 1992 as an analyst of the packaged food industry.

Mr. Mauboussin is a former president of the Consumer Analyst Group of New York. He co-authored *Expectations Investing: Reading Stock Prices for Better Returns*. He was repeatedly named to *Institutional Investor*'s All-America Research Team and the *Wall Street Journal* All-Star survey in the food industry group. *SmartMoney* magazine has named him as one of its Power 30, a list of "the most influential people on Wall Street."

Mr. Mauboussin received his B.A. from Georgetown University. He is an adjunct professor in finance and economics at Columbia Business School, and serves on the board of trustees of the Santa Fe Institute, a leading center for multidisciplinary research in complex systems theory.

The first I call organizational constraints, but they basically emanate from agency problems. I think Charles Ellis framed it best when he contrasted the "business" from the "profession" of investing. The business is about generating fees; while there's nothing wrong with having a vibrant business, actions that seek solely to maximize fees (or keep them from dropping) can be detrimental to performance. The profession is about delivering superior long-term results for your shareholders.

The challenge is that the pendulum feels like it has swung from the profession to the business. The number of mutual funds and hedge funds has massively proliferated in recent years, and the new funds are often launched precisely where performance has been best in the recent past! For example, Jack Bogle notes that 44 equity mutual funds advertised in the March 2000 issue of *Money* magazine—mostly hot tech funds—had average one-year results of 85.6%. This is the exact opposite of what contrarian investing is all about, although it is arguably good business—at least for the short-term.

Another example is that fees over the years have been rising, not falling. Many mutual funds companies seek to maintain assets, so they ask their portfolio managers to minimize tracking error. Many portfolio managers complain that too much of their time is dedicated to bringing in assets versus delivering financial performance.

Hedge funds are not immune to these agency issues. The recent popularity of absolute return strategies may cause some managers to make shorter-term bets than what makes ideal economic sense. The recent introduction of long-only funds by some prominent hedge funds raises some interesting questions, as well.

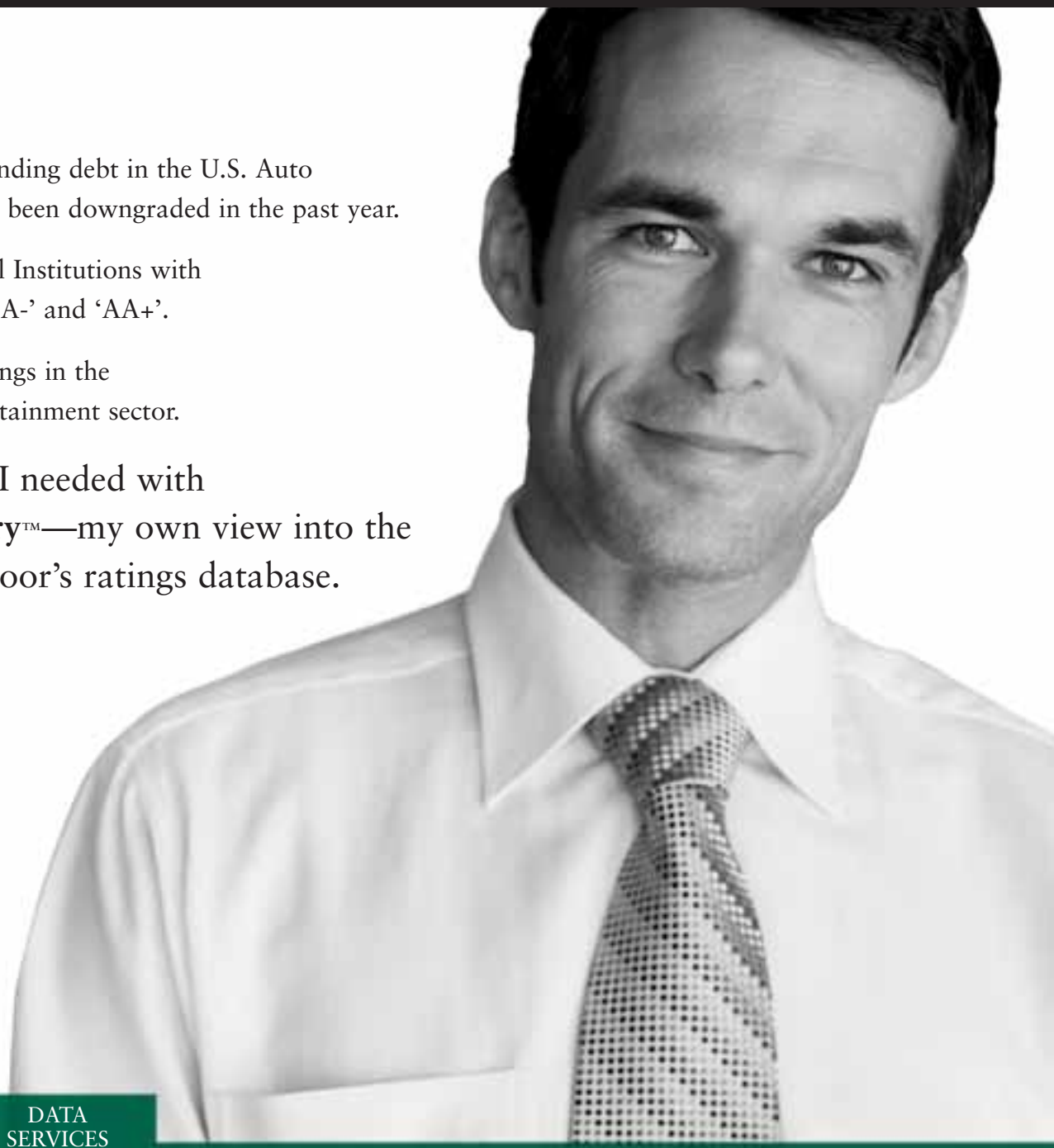
Contrarian investing is clearly very difficult. The first step toward successful investing is clarifying the issues and how best to think about them.

Even if an investor operates in an environment focused on the profession, successful contrarian investing requires a certain psychological makeup.

One of John Maynard Keynes's many great lines from *The General Theory of Employment, Interest and Money* is that "worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally." There is no better lead in for the significant psychological constraints of contrarian investing. Without dwelling on the various subpoints, two major psychological requirements capture the idea:

- *Independence*. Again, the goal is not to be a contrarian just to be a contrarian, but rather to feel comfortable betting against the crowd when the gap between fundamentals and expectations warrants it. This independence is difficult because the widest gap often coincides with the strongest urge to be part of the group. Independence also incorporates the notion of objectivity—an ability to assess the odds without being swayed by outside factors. After all, prices not only inform investors, they also influence investors.
- *Long-term orientation*. Investing is inherently a probabilistic exercise, where process should be the focus versus short-term outcomes. Contrarian investors acknowledge that it may take some time for the market to revise expectations. This problem is compounded by myopic loss aversion, the idea that the more frequently you assess your portfolio, the more likely you are to see losses and hence suffer loss aversion.

To conclude, contrarian investing is clearly very difficult. The first step toward successful investing is clarifying the issues and how best to think about them. These comments are my attempt to do just that. ●



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Fundamentals, Technicals, And Psychologicals

Woody Dorsey, Semiotics Partners LLC | May 15, 2003

The ancient Greeks developed a system of medical diagnosis that they called semiotics. In the financial context, the market is our patient and our occupational hazard is to diagnose market disequilibrium. Our job, essentially, is to diagnose the symptoms or the errors of the markets.

Humans have always tried to interpret the behaviors around them, whether it was the habits of the wooly mammoth, the exchange of beads, or changes in options volatility. Behavioral finance is partly just a rediscovery of our basic competitive motivations, our common sense, and perhaps our common cunning.

Contrarianism in popular investment philosophy, which pre-dates modern behavioral finance theory, is really quite ill-defined. It has been a convenient catchall for a variety of perspectives about outsmarting the herd. Of course, all successful investors are contrarians by default. To do better than the crowd, one has to be ahead of it. There is a persistent behavioral thread that stretches from ancient human knowledge through the market lore of contrary opinion all the way to behavioral finance. When Homer spoke of Odysseus, he was talking about our hard-wired human characteristic for trying to outwit our competitors. Plato's famous allegory of "The Cave" is an equally apt illustration of these ideas.

The projections of Wall Street continue to seduce us. The herd is still fascinated with the shadows on the cave wall, or perhaps fascinated by the pixels on their Bloomberg screen. Adam Smith, the pop star of economics, also known as the invisible hand man, came by his behavioral ideas from the physiocrats and the philosophers of France who preceded him. These ideas have always existed and have always been borrowed or passed on precisely because human motivations are immutable. There is no difference between Smith's invisible hand, John Maynard Keyne's animal spirits, and the idea of a Mr. Market. These are all descriptions of the same mysterious motivations of man and the marketplace.

Let's fast forward to Daniel Kahneman and Amos Tversky who are referred to as the prospectors, since they mined the early behavioral ore. Their prospect theory officially initiated the study of economic man rather than of economics. When we study man, we enter the realm of psychology. Behavioral finance is not about price-to-earnings multiples or the behavior of distressed securities. Rather, it is about the study of distressed securities traders. To paraphrase the ancient dictum of "man is the measure of all things," we might say: "man is also the measure of all markets." Thus, any and all information regarding man—from anthropology to perhaps even zoology—may provide new fodder for behavioral finance.

Behavioral finance is not about price-to-earnings multiples or the behavior of distressed securities. Rather, it is about the study of distressed securities traders.

We landed man on the moon and we have mastered the genetic code. We have a language, mechanics, and knowledge of these things. But show any equally precise language mechanics or knowledge of the market. It does not exist. We are woefully in the dark about markets and teenage daughters! This is the dirty, little secret of the dismal science—there is no cohesive economic science about making money in the market. Robert Ruben said, "Everything I have experienced suggests that at the core, economic conditions and markets are grounded in the human psyche." That's Robert Rubin. The reason why we have so little experience, so little expertise in markets, is because of the persistent

denial of the psychological component. We are taught to believe that markets can be understood from a purely rational perspective. We are, in fact, all steeped in a Cartesian conceptualization of financial culture. Rene Descartes came down rather heavily on the mind side of the mind/body problem when he concluded, "I think, therefore I am." This may partly explain the preference for rational markets.

Perhaps the peak in this one-sided cognitive concept of efficient markets and man as a purely rational economic robot reached its acme in what I called the wrongly termed capital hedge fund bubble, in which the best of the mathematical rationality team managed to lose the majority of the investors' money. If that did not signal the end of the efficiency era, the dot com bubble, which I called E*greed, certainly did.

So how do we proceed? New strides in behavioral finance, in my view, lie in the direction of cognitive science. My research initiative has been to look at the cognitive structure of man as a guide to the markets. And the primary fact of cognitive science, and the simplest one, is that man is composed of three distinct brains that perform three distinct functions. Now, market analysis to date has generally mirrored the bipolar duality of Descartes. There are the fundamentals on one side, definitely opposed by the technicals on the other side. Something may be missing. The missing link is what I have coined as the psychologicals.

The psychologicals are how we feel about the market. This is quite distinct from the fundamentals, which are what we think about the market, and distinct from the technicals, which are how we act in the market. We are all rational people, are we not? But we are also all irrational people. And we are also all instinctive people. These three functions are as present in markets as they are in man and are in a perpetual interplay. My innovation, which I call Tri-unity theory, is a reflection of these three components.

The idea of irrationality may be considered the pith of behavioral finance. But what is it? For most people, irrationality has a negative connotation. It infers that feeling is taking precedence over thinking which is, of course, bad. Irrationality is considered fuzzy and unmanageable unless, of course, we are in love or our market position is suddenly making a lot of money.

Alan Greenspan said, "There is one important caveat to the notion that we live in a new economy, and that is human psychology—which appears to be essentially immutable."

OK, but why aren't these immutable laws of psychology, whatever they are, in any graduate school curriculum?

To quantify the psychological component of the market, I propose a basic unit of emotion that I call an "emotum" or "emota" in the plural. I have for some time conducted a polling process that simply collects positive and negative emota from about 100 listening posts that represent what I call the semi-professional cast of investors. This sentiment database is the source for various semiotic sentiment studies.

The notion that investors must conquer their emotions is equally as absurd. In fact, it is impossible. We are always and will always be emotional. Irrationality rules and it may have rules.

A white paper that Andreas Calianos and I wrote shows how a very simple sentiment model outperformed the S&P 500 by 257% from 1998 to 2003. This is rather amazing. It is hard to believe that such a simple sentiment model could be so robust. But that is the point, after all. We like to believe in complex rational models and we do not necessarily understand market emotions very well.

The sentiment model is based on the observation that price highs and price lows are characterized by quite different correlations between price and sentiment. This goes very much against the prevailing and parochial notion that fear and greed are the only two market emotions and that they are polar opposites. The notion that investors must conquer their emotions is equally as absurd. In fact, it is impossible. We are always and will always be emotional. Irrationality rules and it may have rules.

Fundamentals are whatever market participants are thinking about the market. These ever-changing fundamentals may be better described as being transient investment themes. The history of markets demonstrates that the extreme of every economic era is defined by a compelling concept that becomes so simple and so popular that it effectively becomes a slogan. Memetics, which is the study of the propagation of information, provides some insight into this phenomenon. A meme, similar to a gene, is an information code that is transmitted from person to person. The semiotics memetics model suggests that when these transient investment themes enter the propaganda realm, they finally lose their power to attract new investors into their paradigm. This understanding has identified extremes such as the fantasia deflationary climax in the fall of 1998, the E*greed extreme of 2000, and what I call the "equaphobia" extreme of recent months.

These themes can be identified and measured through what we call a slogan search. For instance, from January 2001 to April 2003, a slogan search for Iraq as a media headline had a

negative 85% correlation with the S&P 500. In fact, extreme readings in the Iraq slogan corresponded almost exactly to the stock market lows of October 2002 and in March 2003.

Memetics works and it makes ideas such as information cascades and viral propagations more practical. Now, there are many interpretations of technicals. My own definition is quite different than moving averages or chart patterns. Technicals are simply all of the physical facts or vital statistics of the market. All technical systems from Dow theory to Elliot wave theory, etc., try to answer a simple question: what is the trend of the market. I made a direct study of market trends called trend duration analysis. When we talk about the persistence of bidders or the exhaustion of sellers, we are all alluding to the physical nature of these attention spans in the market. The duration characteristics of market trends do demonstrate discreet repetitive trend duration modes. Yes, the market repeats itself, too.

> Observe everything, believe nothing, and invest solely based on the behavioral errors of others.

The essence of behavioral finance is this systemic repetition of habitual errors. These trending habits are the physical heuristics of the market. In the same way that memes are the metrics of the fundamentals and emota are the metrics of the psychologicals, price bars are the metrics of the technicals. These three functions of the market, with their metrics and models that I call Tri-unity theory, may lead toward a more optimized behavioral finance that may be able to predict some of the markets some of the time. The invisible hand does leave some fingerprints. The herd leaves footprints. The risk to the adulterated development of the behavioral finance school, however, is that there will be a rapid and probably vapid co-opting of behavioral finance schemes by Wall Street. After all, the rational market era ended as a pocket-lining paradigm for Wall Street once it was suitably rendered as a buy and hold bullish story.

Behavioral finance is already at risk of being simplified and conveniently packaged. There are hosts of behavioral departments working on behavioral ideas that will eventually blossom into behavioral funds of all sorts. So expect to see lots of behavioral shingles blowing in the wind. I say this is the risk, but it is a practical certainty that the language techniques that appeal to behavioral ideas, great and small, will move to the herd. After all, one of the behavioral tenets is that we are all herders; we are all hardwired to imitate whatever we perceive as accepted and useful. The opportunity for the behavioral school lies in the higher ground of potential societal benefits. The issue is the degree to which there is an evolutionary aspect to man as an economic animal. My own view is that the efficient market's era, and even the Cartesian world view, was a deviation for a more integrated understanding of humanity.

Behavioral finance is an enormous opportunity for an intellectual and practical redirection of how we understand ourselves, and by extension, how capitalism can be both better understood and better managed. How these risks will interweave in the narrative of intellectual history is difficult to say, but there are parallels to the prior paradigms in which the alternative asset industry may be where random walk and the mutual fund industry were, say 20 years ago. l

There is much more to learn about both human and market behavior. There are also things that we may never learn about. To conclude with a semiotics meme: observe everything, believe nothing, and invest solely based on the behavioral errors of others. ●

Woody Dorsey is the president of the research firm Market Semiotics Inc. Market Semiotics publishes a weekly research service based on the behavioral and emotional influences of the market. Mr. Dorsey has developed a new hypothesis of behavioral finance analysis which he calls Tri-unity theory. Mr. Dorsey published *Behavioral Trading: Methods for Measuring Investor Confidence and Expectation* in 2003. He also publishes a total return trading service called AlphaBips. His insights are original and his strategy is a unique one. Mr. Dorsey studied economics at Amherst College and he's never worked for a Wall Street firm. He lives and works in rural Vermont.

Six Impossible Things That Are Possible

Robert Shiller, Yale University | May 15, 2003

The efficient markets revolution that came in the 1970s was an important scientific revolution because it brought a discipline called mathematical finance. For example, we now understand derivatives pricing and the capital asset pricing model. These are important. People in the mathematical fields feel and act threatened by behavioral finance. But they should not feel threatened because this new behavioral research is needed to apply their insights. We have to understand how their insights do not fit before they can be used. The best approach is to combine both mathematical finance and behavioral finance at the same time.

My book, *The New Financial Order,* is motivated by several things. One of them is behavioral finance; another one is mathematical finance that gives us a sense of how to manage risks. The whole capital asset pricing model was a wonderful description of how the world should work.

There is the sense that new information technology—computers, Internet, and teleconferencing—are wreaking fundamental changes in our world. Over the past 10 years, it has been amazing what has happened, and over the next 10 or even 20 years what fundamental changes will occur in our society, among them in finance. The whole finance profession will be transformed.

The book puts behavioral finance, mathematical finance, and the new information technology together—laying a possible path down for the future. So this is a futuristic book that is not really aimed at portfolio managers, but rather the finance community because it addresses new products and new ways of doing things that are likely to come in the future.

Part of my discussion concerns a financial order—it is about Rene Descartes who thought that the world and the mind could be rational and that the brain is really organized into a rational and irrational system, which is important for human motivation. People find it difficult to take account of big abstract risks that are not obvious. By our nature, when a wild animal approaches us, our adrenalin starts flowing and we take quick action. We are quite reliable at that. But when it is just some vague possibility, it is emotionally difficult to grasp the situation and most will postpone and not think about it.

When it is just some vague possibility, it is emotionally difficult to grasp the situation and most will postpone and not think about it.

Behavioral finance gives some idea of how we can readjust our institutions so that these things are taken into account. There are six ideas for a new financial order. Each of them may sound futuristic or implausible, but I believe that things are changing quickly and it may often be in little details. Behavioral finance can make new things possible in a non-dramatic way. That is often the way of progress. Some inventions, such as airplanes, were not feasible until the right internal combustion engine was ready. Then, suddenly, an idea becomes reality. And so it may be the same for many ideas. Some little obstacle disappears and then suddenly things that were blithely assumed impossible suddenly become possible.

So I give my six impossible things. The first one is aimed at the insurance industry and it has two parts. We should create insurance for our ordinary riches, the things that matter to individuals. Call it livelihood insurance, which is really an extension of disability insurance to cover labor market risk.

Right now you can buy an insurance policy that will pay an income for life in case of a disability, but it will not pay an income for life if you are an analyst who suddenly got laid off because of the change in that profession or because you are an auto worker laid off because a Chinese factory can do it cheaper. These are risks we can insure just like anything else and new information technology makes it more possible.

Also, there is home equity insurance. Fire insurance insures homeowners against loss of value. But there are no insurance policies against the devaluation of a house because of declining economic conditions, which is a much bigger risk. These things are becoming possible now.

The second idea is for the securities industry—we should create new securities that represent claims on income flows. The stock market is a market for claims on corporate profits. But corporate profits are about 10% of GDP after tax. They are not very big. We can create markets for claims on the other 90% and if we do that we will have a market for risks that is much more comprehensive. And it makes many more things possible. For example, it might help with livelihood insurance because insurance companies can use these new securities markets to get rid of the risk they had undertaken by taking on policies.

You can buy an insurance policy that will pay an income for life in case of a disability, but it will not pay an income for life if you are an analyst who suddenly got laid off.

The third idea is for the banking sector of the lending community, and that is that we should make loans and interest contingent on the income of the borrower or on an index of incomes of people in the same occupation or category as the borrower. This would not just reduce bankruptcy risk—it would make just for better risk management. This idea goes back to Milton Freidman. Friedman said people should sell shares in their income as a way of reducing risk. That is basically the idea of making or changing our lending institutions so that you are essentially selling a share.

But he said it is not possible for two reasons. One is public condemnation—irrational public condemnation. The other thing is that it would be too costly to administer. How can you track people through their lives? The cost of administering these kinds of things has gone way down because of new information technology

The fourth idea is for the government and its so-called inequality insurance. It is a way of protecting the society from a gratuitous increase in the level of inequality.

The fifth idea is inter-generational Social Security. This is an idea motivated by mathematical theories of finance that in order to apply risk management, you have to look at big risks that are not shared. That is where you get the welfare gains. If risks are already shared, there is not much to be gained. However, if they are not shared, you can move. So I think a big opportunity is between the generations—between elderly, middle-aged, and working, and young people. The Social Security system should be reframed on that concept.

The last idea is one that receives the most opposition. The idea is for international agreements for risk control. The idea is that you take world leaders, government leaders, and you give them a little lesson in basic finance and you teach them about risk management. So what they would do then is make risk-managing deals between countries, just like companies do. So when the president of the United States meets with the president of China, the first thing on their agenda would be arranging a swap between the two countries, a GDP swap. The mathematical theory has enormous social welfare benefits.

In history there have been a number of major changes in financial institutions that were truly radical and seemed impossible. One of them is life insurance. Life insurance was invented in the 1600s in London, and it was made possible by some academic Russian professors or probability theorists. They invented this whole idea of probability theory and then someone in the 1600s said we should develop life tables and then we can create an actuarial science and we can create a whole business that manages the risk of early death. But life insurance did not rise in importance until the 19th century. Few people bought life insurance, just a few intellectuals. The problem was that people could not understand the concept. A few intellectuals understood it but most people did not.

Most people do not conceive the need for life insurance. You have to be sold it, and in the 18th century there was hardly anyone who would say they needed life insurance. They would not get on their horse and ride into town to buy life insurance. They would get on their horse and ride into town for many different things, but not life insurance. You had to be sold it. So the advances in marketing and in packaging developed in the 19th century overcame resistance. And now, everybody has life insurance. It is an obsolete institution. It used to be very expensive and a serious thing to buy because the life expectancy was 45 years and you had these young children to worry about. It was a big decision to buy life insurance. Now with the life expectancy up to 75 or 80 years, it is cheap. Nobody even thinks about it—we just buy

it as a reflex action. However, it is an obsolete institution mostly because it is not addressing the big risks that we face today. It is not early death. The big risk is the risk of economic change that can affect all of us in unpredictable ways.

The final example is Social Security, which came in Germany in the 1880s. Our current system in the U.S. is almost a carbon copy of it. It took the U.S. until 1934 to adopt it. Social Security protects the elderly against extreme poverty. It solved the problem. That is why everybody in the world adopted it. It was all copied from the German model.

What made this safety net possible in Germany in 1889? It was information technology. We do not think of the 19th century as a century of rapid progress in information technology, but in fact, the 19th century was a time of stunning progress in information technology. And it was simple things that we take for granted. It was the invention of cheap paper. Paper in the 18th century was made out of cloth by hand and was very expensive. It was said that a subscription to a newspaper in 1800s, bought in today's dollars, would cost about $9,000 a year. It was because paper and printing were so expensive. So they invented wood pulp paper; they invented carbon paper so they could make copies; they invented printed forms; they invented filing cabinets; they invented a better civil bureaucracy; and they invented a better postal service. The cost of mailing a letter in 1800 would be equal to today's Federal Express costs. People were not as rich then, so the typical person would only get three or four letters per year.

But people in 1889 had doubts when they set up the Social Security system. They did not think the government could do it. They doubted that the system would transfer the regular contributions to the government; that the government would keep track of the payments for all those years; that when a person retired, there would be records; and that someone would calculate the correct monthly payments. People doubted it could be done because of its expense. Well, it would have been practically impossible in 1800, but in 1889 it was possible and it happened. ●

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His 1989 book *Market Volatility* (MIT Press) is a mathematical and behavioral analysis of price fluctuations in speculative markets. His 1993 book *Macro Markets: Creating Institutions for Managing Society's Largest Economic Risks* (Oxford University Press) proposes a variety of new risk-management contracts, such as futures contracts in national incomes or in real estate that would permit the management of risks to standards of living. His book *Irrational Exuberance* (Princeton 2000, Broadway Books 2001, 2nd edition Princeton 2005, and in 15 foreign language editions) is an analysis and explication of speculative bubbles, with special reference to the stock market and real estate. His book *The New Financial Order: Risk in the 21st Century* (Princeton University Press, 2003, 2004, and in eight foreign language editions) is an analysis of an expanding role of finance, insurance, and public finance in our future.

He has been research associate, National Bureau of Economic Research (NBER) since 1980, and has been co-organizer of NBER workshops: on behavioral finance with Richard Thaler since 1991, and on macroeconomics and individual decision making with George Akerlof since 1994.

He is co-founder, with Karl Case and Allan Weiss, of Case Shiller Weiss, Inc., an economics research and information firm that was sold in 2002 and renamed Fiserv CSW, Inc. He is also co-founder and principal, with Allan Weiss and Samuel Masucci, of Macro Markets LLC, a firm devoted to the development of innovative risk-management devices for our largest risks.

He served as vice president of the American Economic Association, 2005, and president of the Eastern Economic Association, 2006-07. He writes a column "Finance in the 21st Century" for Project Syndicate, which publishes around the world.

Mistakes Lie Not In The Stars But In Ourselves

Richard Geist, Institute of Psychology and Investing | June 1, 2000

If we want understand the psychology of investing, we need to adopt an inter-disciplinary approach and look at the market from different perspectives. For the past eight years, I have been interviewing individual and institutional investors asking them how they make decisions. At Putnam, I asked analysts about their biggest mistakes and their psychological origins.

Over the years, a dominant theme that has emerged is that it no longer depends on how smart we are, how many degrees we have, how much experience we have, or whether we use technical or fundamental systems. What really matters is how we handle our emotions at the time of buying or selling and how we respond to what others are doing in the market. The general consensus from the feedback I received is that the Internet is changing the psychology of investing, for better or for worse. That change does not mean that this time is different in the traditional sense applied by those who are naively optimistic or complacent. But when fundamental valuation methods change, when market volatility increases, when one-out-of-two retail trades is done on the Internet without a broker, when E-commerce begins to shift the way a whole culture does business, when investors in different parts of the world can communicate in a split second, or when more and more investors assume a trading mentality, all of those factors have to impact on our emotional state when trying to make investments. These factors also have a dramatic effect on how institutional firms market their products and how we begin to structure the relationship between advisors and clients.

What really matters is how we handle our emotions at the time of buying or selling and how we respond to what others are doing in the market.

I would like to address the psychology of how institutional and individual investors have told me they make mistakes. Some factors are instructive and offer insights into why investing seems to be changing in the Internet age. There are many arguments on rational and irrational markets and whether people are rational or irrational in how they make decisions. Behavioral finance has helped us to understand that markets are not as rational as was widely believed. When people make investment decisions, they are not Mr. Spock in *Star Trek,* who is unemotional, unencumbered by relationships, rational, and logical. We are neither rational nor irrational investors. We are subjective investors. Because of the Internet, we all have access to the same information.

People are overwhelmed by the amount of information available. But we all have idiosyncratic lenses that filter that information. Those lenses, which I call psychological organizing principles, enable us to filter information and then interpret it in particular ways that leads to certain decisions.

What is helpful for investors is to begin to understand our own subjective organizing patterns. For example, a money manager bought a small stock at $18 a share. She then watched the stock go to $25. Then the company announced that it was transferring its sales force from an outside group to an inside group. It was taking charges and predicted that earnings would be hurt for two quarters. The stock dropped to $13. She wanted to sell all her shares at that point. When we talked about it she had an incredibly good understanding of the fundamentals of the company that, in essence, had not changed. What was prompting her to sell at that point? It was one of the filters that she used to understand data. We all have them and most of them are unconscious. Her organizing lens told her that when something good happens, something bad is sure to follow. For that stock, something good had happened, it had started to go up. Something bad had happened and it dropped. Therefore, she should sell.

Once she realized that she was operating according to that organizing pattern, she went back to her fundamentals and did not sell. In fact, the company was bought out six months later at $30 a share.

Another common error made by institutions and individuals has to do with anxiety. The amount of information and the volatility in correcting markets creates enormous anxiety. What happens when we experience anxiety? There are two important things that happen. The first is what I call jigsaw puzzle thinking. In other words, when we are making an investment, we generally look at something holistically. We try to get as much information from as many different perspectives as possible. When we experience anxiety, that holistic way of thinking changes and we tend to pick one or two variables to make the decision. We forget about our holistic view of what originally caused us to buy or sell it.

Another common error made by institutions and individuals has to do with anxiety. The amount of information and the volatility in correcting markets creates enormous anxiety.

For example, an institutional investor bought Express Scripts at its IPO price of $13. The stock went to $30 very quickly. Then there was a corrective phase as the stock fell back to $20. The investor wanted to sell his holdings although he had a comprehensive understanding of Express Scripts and the pharmacy benefit group. What he began to focus on was the price and the volume of the stock and that told him to sell. The fundamentals of the company and the industry would have told him to buy more. He sold out at $20 and Express Scripts then went on to over $100 pre-split. His decision was made on the basis of a couple of factors that had nothing to do with the holistic way of thinking. The more we understand the symptoms that represent our anxiety, whether they are physical, cognitive, or emotional, the less we fall into that kind of trap. When we feel anxious our thinking processes tend to regress from logical, rational ones to more emotional ones. If I asked you to tell me the first word that comes into your mind when I say "mother," your first reaction will not be the description that you would find in the dictionary. Mother is an emotionally loaded term. Your thinking process would connect words and thoughts by emotions rather than logic. That is exactly what happens when we feel anxious. It is easy for people to be taken in by Internet chat rooms and the media because we feel anxious and begin to connect our thoughts by emotions rather than logic. And we act on those much more quickly.

Another primary reason for mistakes is the connection between our self-esteem and the market's performance. When we make an investment, we are holding ourselves up for some kind of validation and affirmation in which our intellectual and judgments are sound. When the market goes against us there is an injury to our self-esteem and there are a number of reactions that tend to occur. One example is a well-known analyst from a major brokerage firm who lowered his rating on a stock to "hold" from "buy." When I asked him what caused him to lower that rating, he said, "the company's earning came in three cents under what they led me to believe and predict the earnings would be. They really screwed me. They had no right to do that. To teach them a lesson, I put their stock on hold." Institutional and individual investors were selling it off.

Later, he came back with a strong buy on the stock. But it was the effect on his self-esteem and feeling injured by management that caused him to lower the rating on the stock. This happens over and over again in the market. People need experts to look up to and to merge with. Saying that I dinner yesterday with Warren Buffet makes me feel good. The Internet economy has really promoted that kind of herd behavior because it is much easier to connect with people in chat rooms.

I am optimistic about the future. Today's investors are more educated about the stock market than ever before. Ten years ago, there was not a business radio talk station in every major city in the country as there is today. People want to learn about investing. They have to learn about the market. There is no other way for baby boomers to retire or send their kids through college. Investing has become a cultural phenomenon. People have found that the market can be fun. It can be intellectually and emotionally challenging. It is the equivalent of sports in this society at this point. Time will tell whether that is something positive or negative.

The baby boomers are growing older. What happens to your sense of time when you grow older? It goes more quickly. If you ask a child how long something takes, it is often very slow. Once you pass 40, time begins to move quickly. That has a dramatic effect on how people invest. When your sense of time increases, you have an inordinately higher tolerance for risk. In other words, when time is moving slowly, you feel when your stocks are down that you are in the doldrums forever. When your sense of time is moving quickly, you do not feel that this drop is going to last forever. You are much more likely to buy on the dips. You are more likely to sit through corrections and bear markets.

Since 1993, I have predicted that baby boomers would not abandon the market in the face of severe pullbacks. And

so far they have not. Money has been pouring into this market. People have been on the sidelines, but there have not been redemptions. There are trillions of dollars sitting in money market funds waiting to come back. People also have gone from investing in the market to niche investing. Baby boomers are not investing randomly. They are investing in areas that they know. The original investors in Amazon.com were people who understood technology. They had some notion of how the Internet was going to affect this economy. We are also seeing, because of the Internet, much more interpersonal investing.

An example of this would be the symbiosis between Buffet and Charles Munger. The two work together enhancing each other's understanding of certain aspects of the market. Because of the Internet there is more of that small group and partnering investing. I have found from my interviews that this kind of interpersonal investing produces better returns than individual investing. It also produces better returns than large group investing.

We will see an intergenerational transfer of wealth of $10.4 trillion which, remember, will go to baby boomers over the next 20 years in the form of inheritance money, and wind up into the stock market. Baby boomers love the stock market. They need the stock market. They want to be in the stock market. They will learn as much as they can about the stock market. ●

Dr. Richard Geist is president of the Institute of Psychology and Investing, Inc., established to provide consultation to brokerage firms, money managers, financial planners, and small companies in the areas of management consultation, psychological stress, impact of psychology on investor performance, risk, public relations and marketing, and planner or broker/client relationships.

He is co-editor of *The Psychology of Investing* (1999), and the author of *Investor Therapy* (2003). Dr. Geist serves on the board of directors of the David Derman's Institute of Psychology and Financial Markets and on the editorial board of the *Journal of Psychology and Financial Markets*. He is a member of Dick Davis Publishing Editor's Roundtable. Dr. Geist is also co-director of Harvard Medical School's Annual Psychology of the Investor Conference. He writes independent research reports for small and emerging companies. Dr. Geist's recommendations have been in *Dick Davis Digest, Investors Digest, Business Week, Fortune Magazine, Bull and Bear, The Wall Street Journal, Barron's, Harvard Magazine, Financial Planning Magazine, Forbes, The New York Times,* and *USA Today.* He is frequent commentator for CNN, CNBC, NBC, PBS, Fox Network, and Bloomberg Television.

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Factors Driving Our Irrational Exuberance

Robert Shiller, Yale University | June 1, 2000

I will take an academic perspective as one who has been organizing the National Bureau of Economic Research, a regular conference of college professors on what we call behavioral finance. Behavioral finance attempts to understand the psychology of financial markets. It seems that we in the academic community move in groups that never communicate. I have always been struck at how the different departments all have their own chorus. It is particularly striking that the economics department has no communications with the psychology department, the medical school, the sociology department, the anthropology department, or the history department. It seems fundamental to good work that we incorporate the insights from the various disciplines.

My motivation is based on the notion that conventional economic theory is extremely valuable, but it does not take into account the other social sciences like psychology. I recently wrote a book called *Irrational Exuberance*. It is a scholarly book, but in many ways it is a popularization of behavioral finance.

To get a broader public interested in this field, it is important to tie it in with a national event of some concern to people. The book is built around the current level of the stock market, which is a source of obvious concern to many people. It analyzes the current stock market situation in terms of both the conventional economics and the behavioral finance standpoints. The title comes from a talk Federal Reserve Board Chairman Alan Greenspan gave in December of 1996 where he used the term to frame a question: "how do we know if the financial markets show irrational exuberance?" Despite the fact that it was such a nebulous question, stock markets all around the world immediately dropped sharply.

> The savings rate is very low. People are borrowing against their homes to buy stocks. We are neglecting some of the important issues like Social Security.

Why did people react to that statement? Many of us are concerned that some kind of investor psychology has been driving the markets. Yet, most of us are ambiguous. We do not know whether we believe it or not. We feel that it has not been shown one way or the other. In this book, I wrote an authoritative treatise, as authoritative as I could make it, arguing the case. The position is that irrational exuberance is actually a very good term to describe what is going on in the stock markets. It is a national policy issue of great importance.

The overpricing of the market is affecting our decisions and distorting economic decisions in many ways. It encourages people to invest too much in new startups and business expansions and maybe too little in other things like our own human capital, education, or preserving our jobs. We have the sense that we are all rich, or going to be rich, and that the stock market will continue to grow our investments and as individuals we will retire as millionaires. That is an unfortunate delusion. The savings rate is very low. People are borrowing against their

homes to buy stocks. We are neglecting some of the important issues like Social Security. It is really a debate about how we, as a society, are going to share our risk. The question in some corridors is how we should take advantage of the stock market. There is growing popularity to the notion that the stock market is the solution to all of our problems.

When I began work on this book in 1987, the market had just crashed and I sent out a questionnaire to survey both individual and institutional investors asking two questions: what were you thinking on that day and why did you buy or sell on that day?

It always puzzled me why no one asks people why they did something. Economists will tell you that no one can give you a straight answer. It seems to me that maybe people can, in fact, tell why they did something. So it happens that mine was the only survey sent within the week of the crash. My conclusion may sound too simple—a major element in the crash was a feedback loop or people's reactions to price changes. Prices started going down, people saw them going down, so they decided to sell. That caused prices to go down further and so on. People were not reacting to any news. Maybe a better way to say it is they were reacting to all news, as they always do. When asked about specific news stories they blandly said that they are all important. They said they could not get any answers. No one could explain. There was some crazy psychology happening and so many of them decided to sell. That is a downward feedback loop, while 1982 was an upward feedback loop with cascading price increases.

How does the current stock market situation compare to the past? The real inflation-corrected S&P 500 or the Dow both tripled to record levels in the five years from 1995 to 2000. The NASDAQ went up six-fold over the same time. But I am addressing a broader index. When in American history has the stock market tripled to a record level in real terms? Only once and that was in the 1924-1929 period. Incidentally, earnings have not performed as well.

What caused the stock market to shoot up and while earnings have not? There is no simple answer. If you look at other major historic events that have attracted the interest of scholars, usually there is not a single, simple story. Historians will tend to list many factors and argue that the event occurred because of the confluence of many factors. It is unfortunate that history is so complicated.

In *Irrational Exuberance,* I list 12 precipitating factors. The first one, maybe the most important, is the invention of the Web. That came in 1994, with the Mosaic browser and then the Netscape browser. That is just about the time that the stock market really shot up. What is so important is that it is a significant technological advance. History points to many technological advances whose importance is arguably greater. Why would the Web outshine them all? Think of the railroad, the automobile, the airplane, the radio, the computer, and the television, many examples as that creating fundamental restructuring of our economy and were very important inventions.

When in American history has the stock market tripled to a record level in real terms? Only once and that was in the 1924-1929 period.

What is different about the Web? First, it is a user-friendly device for linking computers and it encourages participation by so many people. It is something that you spend hours a day on. You get a hands-on experience or what psychologists call learning by doing, which is the most fundamental form of learning. You are actually doing things on the Web so you appreciate the importance of it. I think it was this and the Web's random association with the recovery from the recession of 1991 that created growth in profits. It created the impression of a new era.

Second is the amplification mechanism, the feedback loop, a way of amplifying the effects of the precipitating factors. The consequence of feedback loops is that people have very high expectations for stock returns and also high confidence. Confidence in the market is at historic highs. All the stories about "buy on dips" as a philosophy of investing are right. People now believe that there is a strong tendency for reversal. Since 1982, any major dip has been reversed. The 1987 crash was the first. The experience of seeing it actually rebound from dips has created a strong psychological impression. It is something that has become intuitive and deep in our consciousness.

Third are cultural factors such as the news media that are essential to any speculative boom. The financial markets generate millions of prices and the volume of daily data in the newspapers is mind-boggling. People do not know what to make of it. The newspapers tell a story. They are in the business of attracting our attention and telling a story. The human mind is much more attuned to stories with human interest than they are to abstract data. The news media then creates a mindset that alters and encourages the feedback.

Fourth is the new era of thinking. Whenever there is a speculative bubble, there is some expert who claims we are entering a new era where the economy will be better than before. Today it is the Internet. Historically, there were always impressive sounding new era theories and it is useful to read them. In 1901, 1929, and 1966, the three main stock market peaks, you had writers who could be very, very convincing that the economy was entering a new era.

Fifth are psychological factors. What I refer to here are not panics or euphoria, but errors in judgment that are characteristic of people.

The first error is anchoring. When people are asked to answer ambiguous questions, they tend to anchor their answers on whatever comes to mind. Today, no one knows what the Dow should be. Should it be at 4,000 or 14,000? We are prepared to believe anything the market comes up with. And once we have seen it, it sounds about right.

The second error is overconfidence. Psychologists have documented something called an inferiority complex. There are some people who think that they are below average and have no confidence in themselves. However, psychologists have also shown that a far more common syndrome is overconfidence. The overconfident people outnumber the less confident. Most of us think we are above average. If we did not, most of us would not want to trade. But I believe that a very interesting human characteristic is overconfidence in intuitive judgments. People feel very strongly that they know whether the market is going to go up or not. These intuitive judgments are very deep in our psyche. Ultimately, the plausibility that stories or theories are reinforced by our underlying intuitive judgment.

The third error is inattention. If you recall the biggest errors you made as an individual, they probably have an inattention aspect. Usually we make errors because we are not paying attention to something. Attention is an important psychological mechanism that is basic to intelligence, but it is not perfect. One aspect of attention is its social component. We tend to pay attention to the same things and neglect the same things that others are neglecting. As a society, there is a pronounced tendency to watch the same things. When the O.J. Simpson trial happened, a great many of us were watching that. It was remarkable. But we were neglecting other things.

Today, we are experiencing a period of enormous attention to the stock market. You can almost feel it in the air. I

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His 1989 book *Market Volatility* (MIT Press) is a mathematical and behavioral analysis of price fluctuations in speculative markets. His 1993 book *Macro Markets: Creating Institutions for Managing Society's Largest Economic Risks* (Oxford University Press) proposes a variety of new risk-management contracts, such as futures contracts in national incomes or in real estate that would permit the management of risks to standards of living. His book *Irrational Exuberance* (Princeton 2000, Broadway Books 2001, 2nd edition Princeton 2005, and in 15 foreign language editions) is an analysis and explication of speculative bubbles, with special reference to the stock market and real estate. His book *The New Financial Order: Risk in the 21st Century* (Princeton University Press, 2003, 2004, and in eight foreign language editions) is an analysis of an expanding role of finance, insurance, and public finance in our future.

He has been research associate, National Bureau of Economic Research (NBER) since 1980, and has been co-organizer of NBER workshops: on behavioral finance with Richard Thaler since 1991, and on macroeconomics and individual decision making with George Akerlof since 1994.

He is co-founder, with Karl Case and Allan Weiss, of Case Shiller Weiss, Inc., an economics research and information firm that was sold in 2002 and renamed Fiserv CSW, Inc. He is also co-founder and principal, with Allan Weiss and Samuel Masucci, of Macro Markets LLC, a firm devoted to the development of innovative risk-management devices for our largest risks.

He served as vice president of the American Economic Association, 2005, and president of the Eastern Economic Association, 2006-07. He writes a column "Finance in the 21st Century" for Project Syndicate, which publishes around the world.

play a game with my wife when we are at a restaurant—we keep one ear cocked to the other tables. We see how long it takes for conversation on the stock market to come up.

Now what should we do? The financial advice that you should invest in the stock market, diversify, and then buy and hold for the long term is wrong. If the long term is defined as five, 10, 15, or 20 years, stocks will not do well because they are presently so overpriced. I can not say this with any great assurance, but I would believe that over that span of time, this over-confidence will erode. The high market levels are partly because of the "buy on the dips" feedback loop and partly because of exaggerated attention given to stocks.

One last word on what to do is to consider plans to launch and create new markets to allow people to invest more widely. I think we have to expand our financial markets. We must allow people to invest in other assets—not currently available—such as single-family homes around the world. I would like to give people the ability to hedge, to spin off their own risk by shorting their own real estate markets. Moreover, we should have markets for national incomes, for claims on national incomes. It is a mistake to assume that an investment in the Nikkei is an investment in Japan. It ought to be possible to invest in Japan and also to hedge your own risk. Finally, we need to have markets in claims on occupational incomes. ●

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The Behavioral Traps In Investing

Whitney Tilson, T2 Partners LLC | Feb. 16, 2006

I believe Warren Buffett has the final and best word on behavioral finance. He once said something to the effect that investing is not a game where the guy with the 160 IQ beats the guy with the 130 IQ. Once you have ordinary intelligence, what you need is the temperament to control the urges that get other people into trouble.

Let me talk about some of those urges and human foibles that affect people when it comes to investing.

One of the all-time biggies is overconfidence. There are all sorts of funny statistics and studies that show how overconfident we all are. For example, 19% of Americans think they are in the top 1% of wealthiest households; 80% of students think they will finish in the top half of their class; and 80% of drivers think they are better than average. And here is my all-time favorite: at my fifth Harvard Business School reunion, one of the questions was: Do you think you are better looking than the average classmate of yours and 86% said yes! (When I have been asked how I voted, I always take the fifth.)

I guarantee if I asked you to write down two numbers, your net worth when you die and the average net worth of everyone in this room when they die, the ratio would be two-to-one. No matter what group, no matter what the actual numbers are, the ratio between them is always two-to-one. People think they are going to be twice as wealthy when they die as the average person sitting next to them. Obviously, that cannot be true.

Every study of overconfidence shows that people in the investment business are among the most overconfident of all professionals (doctors are up there as well). This is hardly surprising, given that pretty much the only people who go into this business are highly confident, if not wildly overconfident. Yet I would argue that the key to successful investing is humility. You have to have the humility to understand that the wisdom of crowds is immense and that the market, while prone to occasional bursts of terrible inefficiency, is by and large extremely efficient. It is very hard to find mispriced securities. If you are really good or really lucky, you might find one or two per month or, as Buffett argues, one or two per year. You need to understand your circle of competence and not stray outside it. Investing outside your circle of competence is the biggest mistake due to overconfidence. Using excessive leverage, trading excessively, and concentrating portfolios excessively are some of the other manifestations of overconfidence.

Using excessive leverage, trading excessively, and concentrating portfolios excessively are some of the other manifestations of overconfidence.

A second behavioral trap is chasing performance. I am going to let you in on a little secret: 10% of all money managers will be in the top 10% and 1% will be in the top 1%. It is a mathematical truism. Of course, money just pours in to the people who, for whatever short period of time, are in those top percentiles, even though the past does not necessarily predict future performance. One of the most compelling studies that shows this on a macro scale is the study of mutual funds from 1984 to 1995, which were 12 very good years in the stock markets. The S&P 500 was up 15.4% compounded and the average mutual fund was up 12.6%, yet he average investor in the average mutual fund was only up 6.3%.

How is that possible? At first blush, it sounds like I just told you the average airliner flies at 30,000 feet, yet the average passenger on the average airliner flies at 15,000 feet. But in investing, people do not have all their assets in mutual funds—they have assets in bonds, sitting in their bank

account, in real estate, etc. On average, mutual fund investors pile into whatever is hot right at the top, get burned, and then take out whatever is left of their money out right at the bottom. They were investing in tech stocks in March 2000 and then they were selling in October 2002. I have never seen such a study done on funds-of-funds, but I believe that those statistics would be equally if not more true.

Loss aversion is another big behavioral trap. It is one of the hardest things in the world to buy at stock at $10, see it go down to $8, and then sell it. The same is true in the fund-of-funds business. Philip Fisher once said more money has been lost clinging to an investment that has declined in the hope that it will return to the purchase price so you can exit with your dignity intact than any other mistake that investors make.

Here's another example of loss aversion: imagine two six-sided dice. One has a two on each side, and thus has an expected payoff of two. The other has a one on five sides and a 13 on the sixth side, which gives you an expected payoff of three. Even though you have a 50% higher payoff with the unusual die, and even if you let people throw those two dice hundreds of times, the overwhelming majority of people will prefer the die that guarantees a payoff of two. I see this all the time in the investment world where the fund that compounds at 50 basis points a month with very little variability is preferred over someone who is more volatile over shorter periods of time, but yields a much higher return over time.

Another foible is commitment. Once we commit to something, especially if we do so publicly, we will virtually never change that position even in light of the most overwhelming evidence to the contrary. There was a study of racetrack bettors who were asked what the odds were that their horse would win. As they approached the betting area, the odds on the horse were, say, 5-to-1, and they would say that they thought the odds were actually 4-to-1. That is why they were making the bet—because a 5-to-1 payoff was a good bet. Then the bettors were surveyed a few seconds later, after they had wagered their money. Walking away, holding their chit, suddenly they thought the odds on their horse was actually 2-to-1. Nothing had changed. The race had not been run yet, but the mere fact that they had now committed their capital made them more confident in their choice.

In summary, if you were to boil down the two areas that will account for every mistake someone in our businesses will commit, it is failing to invest when you should invest and failing to sell when you should sell. What are the dynamics that cause those two mistakes? This is where you get what Charles Munger calls "Lollapalooza effects"—multiple factors, all piling on top of each other, creating overwhelmingly powerful effects.

What is going on in the failure to buy? Look back at the times you missed an opportunity. In hindsight, it was obvious, but you did not act. There are very powerful emotional forces at work that compelled you not to act. Let me summarize them.

One is anchoring. Let us say you started looking at a money manager and you liked him, and then six months later when you are about to invest, the manager is up 20%. Now you have anchored on the price when you first started looking at the manager, and you have this regret that you did not invest back then. So you decide to wait until the price comes back down to the level it was when you first started looking.

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Another is regret aversion—the fear that your stock investment or manager will go down.

Another is the status quo bias. Not investing in a stock or not investing in a manager is adhering to the status quo, which is a very powerful effect.

Another very powerful effect is choice paralysis. There are thousands and thousands of managers to invest with, so why should I invest in this manager today, when tomorrow I might be able to analyze a few more managers and find a better one?

Then there is information overload. Multiple studies have shown that after a certain point, more information does not add any value to the end decision, and in fact can result in a suboptimal decision. But in today's world there is an infinite amount of information you can collect on a particular manager or a particular stock so, again, why would I invest today when I can collect more information and invest with more information tomorrow?

All of those factors are at work compelling you not to make an investment today. Similar factors are at work in why you do not sell. Once you own something, the commitment and status quo biases work in favor of maintaining your investment in what may be a terrible stock or a terrible manager. And the regret aversion kicks in. Often the reason you are thinking of selling is because it has done badly and you do not want to lock in those losses—you do not want to feel the regret that if you sell today it might go up tomorrow. Again you have information overload. Have I made a mistake here or do I just need to do some more research and collect more information? Maybe I will make a better decision tomorrow.

There is also the factor of vivid, recent evidence where people tend to overweigh recent information and discount things that have not happened in a while. For example, when Enron and WorldCom blew up, all of a sudden every investor was convinced that every company in America was corrupt and crooked. It was a great time for guys like me, because we knew that was not the case, and we could invest in some great companies that were thrown out with the bad ones.

Let us say the stock or the manager has done very well for you. Well, the vivid recent evidence is success, so why would you sell? Similarly, if the manager or the stock has been going down recently, at that point you think it is obvious that you should sell. But then you have loss aversion kicking in on that dynamic.

When you add up these five to seven factors that conspire to paralyze us, it is a wonder we ever make any decisions! ●

Whitney Tilson is the founder and Managing Partner of T2 Partners LLC and the Tilson Mutual Funds. The former manages three value-oriented private investment partnerships, while the latter is comprised of two value-based mutual funds, Tilson Focus Fund and Tilson Dividend Fund. The Tilson Focus Fund, with a 25.68% return, was the No. 1 fund among 867 funds in the Multicap Core category in 2006.

Mr. Tilson is also the co-founder, chairman and co-editor-in-chief of *Value Investor Insight*, an investment newsletter, and is the co-founder and chairman of the *Value Investing Congress*, a biannual investment conference in New York City and Los Angeles.

Mr. Tilson writes a regular column on value investing for the *Financial Times*, has written for the *Motley Fool* and *TheStreet.com*, was one of the authors of *Poor Charlie's Almanack*, the definitive book on Charlie Munger, and teaches financial statement analysis and business valuation for the Dickie Group. He was one of five investors included in SmartMoney's Power 30, has appeared on CNBC, Bloomberg TV, *Lou Dobbs Moneyline* and *Wall $treet Week*, has been profiled by the *Wall Street Journal* and the *Washington Post*, and has spoken widely on value investing and behavioral finance. He serves on the Board of Directors of Cutter & Buck, a public company that designs and markets upscale sportswear.

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Mr. Tilson spent much of his childhood in Tanzania and Nicaragua. He is a member of the Young Presidents' Organization, is vice chairman of the KIPP Academy, which operates four charter schools in New York City, served on the Finance Committee of Cory Booker, the recently elected mayor of Newark, is on the board of the Fistula Foundation and is vice chairman of the Thorn Tree Project, which focuses on educating Samburu children in Kenya. Mr. Tilson lives in Manhattan with his wife and three daughters.

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In addition to regular members, associate memberships are available and are designed as a web-based membership intended for those qualified investors who reside 75 miles beyond Greenwich, Connecticut. Candidates for associate membership must be actively allocating capital to alternative investments, or be an advisor. Associate members have access to the Greenwich Roundtable website with audio recordings, written transcriptions and summaries of symposiums, as well as *Standard & Poor's Greenwich Roundtable Quarterly*, the *Roundtable Newsletter* and the *Best Practices in Hedge Fund Investing* series. We extend to associate members invitations to our monthly symposiums on a space-available basis and every Founders Council evening session.

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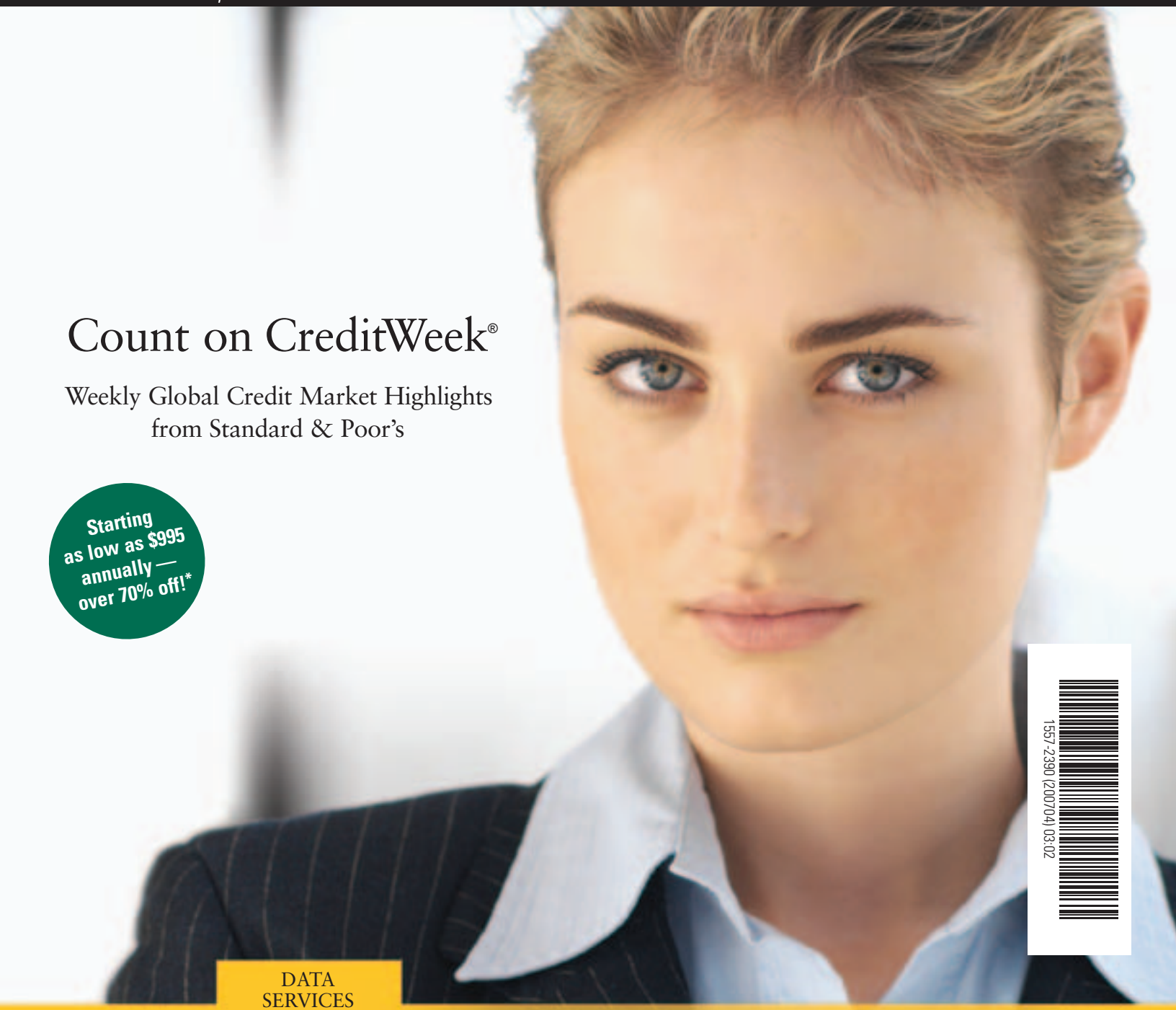
Periodicals postage paid at New York, NY 10004 and other mailing offices. POSTMASTER: Send address changes to *Greenwich Roundtable Quarterly*, c/o Standard & Poor's, a division of The McGraw-Hill Companies, Inc. Attn. Mail Prep. 55 Water Street, New York, NY 10041.



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