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**Global Investor 1.11, May 2011**
Expert know-how for Credit Suisse investment clients

## Emotions and markets

Why booms and busts happen

**Jonah Lehrer** Forget excess liquidity or lax regulation: the real cause of financial bubbles may be our greedy brains. **Thorsten Hens** Learning to recognize their mistakes can help investors make better decisions. **Camelia M. Kuhnen** Why traditional finance theory is so bad at predicting what people really do. **Brian Knutson** Science is providing new insights into the interplay between passion and reason.

**Imprint**
Credit Suisse AG, Global Research, P.O. Box 300, CH-8070 Zurich **Publisher** Giles Keating **Editor** Lars Kalbreier, Kevin Lyne-Smith **Editorial deadline** 23 March 2011
**Production management** Markus Kleeb, Katharina Schlatter **Concept, design and realization** www.arnold.inhaltundform.com: Michael Suter, Giselle Weiss, Michele Iseppi, Sacha Steiner (Project management) **Editorial support** www.arnold.inhaltundform.com: Giselle Weiss, Zoe Arnold, Richard Hall, Greg A. Smith **Printer** GDZ print, Zurich

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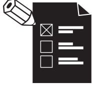

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Almost everyone is influenced by behavioral traits that obstruct the cold logic of rational investment goals. Who can honestly say they are as willing to sell an asset at a loss as they are to sell one at a profit, even if the future outlook is the same for both? Who can really be immune from the collective panic that is so often at its worst when it is probably the best moment to buy, or the collective euphoria which shouts loudest at the market's peak? Who can truly make investment decisions independent of the cultural memory inherited with their nationality, their gender, their community? Academic studies have sought in recent decades to understand the way that such behavioral factors drive markets. In parallel, investment professionals have used these insights to try to improve their judgments about market direction, and to help individual investors understand their own weaknesses and adjust for them. This is not simple, and it is easy to overcompensate. We may feel smart by standing back from an evolving bubble, but in truth, the smart investors move in at an early stage and then out before the bursting point, while those on the sidelines lose an opportunity. In this issue of Global Investor, we address some of these issues. Among a range of articles, Thorsten Hens of the University of Zurich reviews the academic debate on behavioral forces in financial markets. Rolf Bertschi of Credit Suisse discusses some of the insights into investors' behavior that can be obtained by technical analysis of asset price charts. We show some of the ways in which private investors can (by themselves or with help from advisers) recognize and address their own particular behavioral biases in articles by Camelia M. Kuhnen of Northwestern University and Brian Knutson of Stanford University, and by Lars Kalbreier and Roger Signer of Credit Suisse. And we challenge gender stereotypes with interviews from Nahed Taher, Renée Haugerud, Kristin Petursdottir and Lauren Templeton – all founders and CEOs of investment companies – and with historian Jehanne Wake's comments on the skills of wealthy women investors in early 19th-century America.

**Giles Keating**, Head of Research for Private Banking and Asset Management

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The Global Investor received a BCP (Best of Corporate Publishing) award for financial services communications in 2007, 2008, 2009 and 2010.

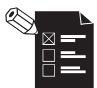
# “A media focus on the company’s losses as opposed to its gains, or vice versa, can color the decisions investors make.”

Analyzing people’s emotional responses to media campaigns has long been a cornerstone of marketing research. Now, the communications sciences are turning their attention to the influence of media news content on financial decision-making. Media effects, both direct and indirect, can lead to behaviors that have profound implications for invidividual investors and the markets alike. > Page 34

## **Werner Wirth** and **Katharina Sommer**

## The emotional investor

Our toleration of stockmarket risk depends to a large extent on our recent experience. If we have had a good run, we may be more risk tolerant, even in a serious downturn. If we have had losses, then we may pull out of stocks prematurely.



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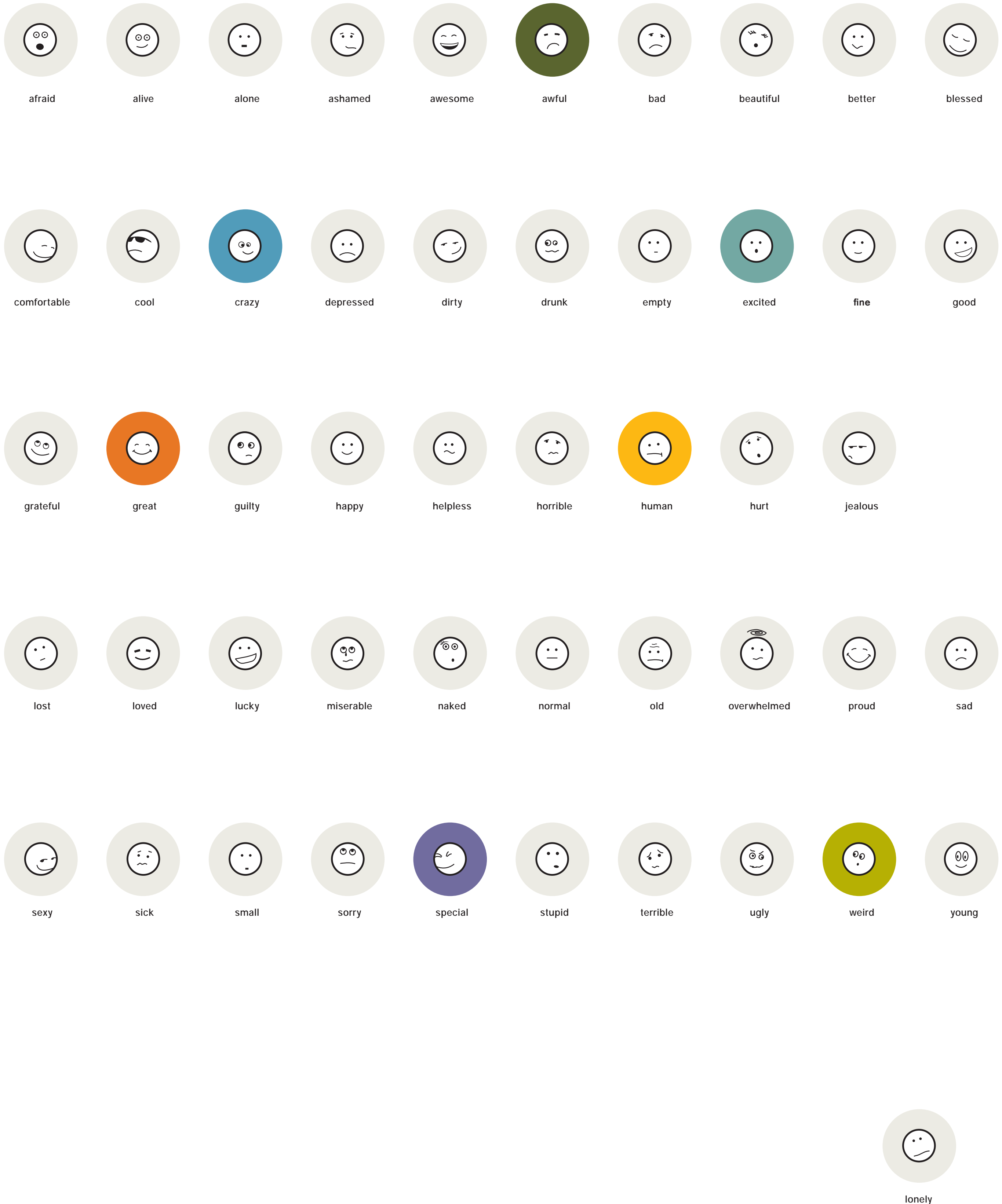


# Emoticons

The (now largely discredited) efficient-markets hypothesis assumes that financial markets are "informationally efficient" and investors make objective decisions based on unbiased data. But bubbles and other price trends show that investors often act inefficiently according to irrational beliefs that ignore underlying value.

# The bounds of rationality

After the huge price swings on financial markets in recent years, many observers would doubtless agree with Benjamin Graham's image of the market as manic depressive – lurching from ecstasy and exuberance one moment to despondency and dejection the next. Our tendency to overreact to unexpected or dramatic news leads to overreactions on the stock markets and causes asset prices to rise above fundamentally justified values.

**Lars Kalbreier**, Head of Global Equity and Alternative Research, **Roger Signer**, Research Analyst

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History shows us that market participants can rarely resist being carried away by collective exuberance or keep a cool head in times of panic. There are many examples of wise men losing fortunes by succumbing to market moods, not least Isaac Newton, one of the most prominent scientists of the 17/18th century, who lost a considerable amount of money in the South Sea Bubble, noting bitterly: "I can calculate the motions of heavenly bodies, but not the madness of people".

Prominent academics and practitioners are increasingly convinced that the "madness of people" – or investor psychology – plays a crucial role in moving markets. Robert Shiller, the author of the best-selling book "Irrational Exuberance,"[1] for example, found that traditional drivers of equity returns, such as interest rates and dividend growth, could not fully explain the volatility that stock prices experience. Indeed, behavioral finance, a relatively new field of financial theory, factors in psychological aspects – the "animal spirits" that motivate investment decisions – and attempts to explain their impact on financial markets.

We believe that this framework can be extremely useful when making investment decisions. It helps to identify our own psychological biases and can steer us towards more rational decisions. Nevertheless, there is still considerable debate among academics as to whether the theory of behavioral finance explains how we actually make decisions any better than traditional finance. Studies that go beyond traditional social science to include insights from neuroscience may ultimately hold the key to a more comprehensive understanding of this highly complex process (see article on page 29).

### The art of not being fooled by yourself

Behavioral finance explicitly assumes that market participants do not act rationally, but succumb to four basic psychological flaws. These flaws are linked to mechanisms of human decision-making, which often relies on rules of thumb in order to process information efficiently. This is not necessarily helpful when it comes to making investment decisions.

The following four psychological features have been identified by behavioral scientists as conflicting with the ability to make sober investment decisions: overconfidence, biased judgments, social pressure and loss aversion.

## 1

Overconfidence is a widely observed phenomenon among market participants, however it is by no means confined to investment activity: 70% of car drivers, for instance, believe that they have above-average driving skills. Similarly, investors often overestimate their stock-picking skills and their sense of superiority is reinforced by >

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selective recollection (bad trades are attributed to bad luck, good trades to skill). Furthermore, market players often overestimate their ability to predict the outcome of future events, such as corporate earnings growth rates, which, in turn, leads them to set overly narrow confidence bands for their estimates. They frequently engage in overtrading – incurring high costs – and are surprised by the discrepancy between projected and actual earnings. Another potentially negative outcome of overconfidence is that diversification guidelines are no longer heeded as investors, who may be very particularly familiar with a given company or industry, fall prey to the belief that they have "cracked" the key drivers of a specific stock. Inevitably, this often leads them to concentrate their wealth in stocks in which they believe themselves to be experts.

# 2

Biased judgments usually involve individuals weighting recent experiences more heavily than they should. For instance, in one experiment [2], a group of candidates was asked to bid for a range of products, such as bottles of wine, books and computer equipment. Before writing down their maximum bid for each product on a bidding form, each candidate was given a two-digit candidate number ranging from 00 to 99 which they had to write onto the bidding form immediately before noting their bidding prices. Curiously, candidates with high candidate numbers bid higher than candidates with low candidate numbers. It seems the candidate number acted as a mental anchor in the subsequent decision-making.

A similar effect can be observed after severe equity-market corrections: investors heavily weight their recent market experience and move out of equities into risk-free assets or cash, disregarding the fact that equities have become increasingly attractive after the fall. Investors only gradually begin to realize that they have become overly cautious and start moving back into riskier assets after an extended period of positive market performance. This phenomenon was observed after the market collapse in 2008/2009, when cash positions remained at record levels for more than a year, during which time equity markets delivered attractive returns.

# 3

Social pressure is one of the most powerful motivators in personal decision-making. Staying out of the market while a bubble inflates may seem extremely painful to many, especially if their friends are ostensibly getting rich quick. This sense of "missing the party" leads investors to invest in markets that are no longer fundamentally attractive. Equally, experienced investors may legitimately decide against taking a contrarian stance and elect to ride the bubble for some time, while carefully managing downside risk.

An experiment conducted by Solomon Asch [3] highlights just how influential social pressure can be: a group of candidates was asked to compare the length of a reference line to the length of three other lines; one was the same length as the reference line and the two others were considerably longer or shorter. The candidates were then asked to say which of the three was equal in length to the reference line – a seemingly simple task. While all participants answered correctly when on their own, roughly 40% failed to do so when in a group where a majority was secretly instructed to give the wrong answer.

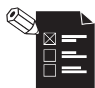

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Photo: Martin Stollenwerk

# 4

Research indicates that converting paper losses into real losses (i.e. selling a stock that has gone down in value) is a uniquely distressing experience for investors. It therefore comes as no surprise that investors tend to hold on to losing positions for too long. A position that has been opened to benefit from a short-term driver, for example, may morph into a long-term investment in the mind of the investor, even after the initial short-term driver has disappeared. This very often keeps market participants away from more promising opportunities. Loss aversion also leads investors to take on larger risks in order to return their portfolio to breakeven.

**Applying behavioral finance to the investment process**

Given the determining role these psychological flaws can have on investment decisions, special attention should be accorded to behavioral finance in the investment process. Establishing strict procedures, such as a rigorous, rule-based investment system that includes strict technical guidelines and profit-taking targets, can help investors and fund managers avoid behavioral traps and keep overconfidence in check. Portfolios should be monitored regularly and risk concentrations flagged to investors. If substantial changes in wealth or personal circumstances have occurred, investors should go back to the drawing board to ascertain the appropriate asset allocation rather than simply making marginal adjustments (status quo bias).

By the same token, taking positions against a major trend (or even a bubble) can be highly risky as the market can be wrong for longer than investors stay liquid. The systematic use of technical analysis, quantitative bubble models and fund-flow data can help investors assess not only how long it may be worth "running with the pack," but when a contrarian stance looks more promising or hedging may become appropriate. Finally, stop-loss rules enforce selling discipline, thereby minimizing the loss aversion created through emotional attachments to certain positions and preventing individuals from holding on to losing stocks for too long.

**Conclusion**

Behavioral finance adds a crucial psychological/emotional dimension to the (often overplayed) rational underpinnings of efficient-markets theory, and investment advisors are increasingly deploying these behavioral insights at various stages in the advisory process. Being aware of the psychological traps into which investors typically stumble can give our clients a clearer picture of the risk/return potential of investments and guide their expectations. Behavioral finance can help client managers identify investors' weaknesses and biases and allow them to calibrate their investment approach accordingly. ■

## "I can calculate the motions of heavenly bodies, but not the madness of people"

Isaac Newton, 1720

[1] R. Shiller, "Irrational Exuberance," Princeton University Press, 2000
[2] D. Prelec, G. Loewenstein, D. Ariely, "Coherent Arbitrariness: Stable Demand Curves without Stable Preferences," Quarterly Journal of Economics (February 2003)
[3] S. Asch, "Opinions and Social Pressure," Scientific American (November 1955)

“Why should
I get left behind?”

“I need to see
my investment
assets grow fast.”

"Before I invest any more, I want to get back in the black."

Photos: Driendl Group, Dan Burn-Fortl, Getty Images | Bernd Vogel/Corbis

“What about you?”

Photo: Shuji Kobayashi, Getty Images

# Making sense of bubbles

The first recorded financial bubble occurred nearly 400 years ago. Over time, these "manias" proliferated, culminating in many market failures worldwide in recent decades. The symptoms of bubbles are familiar, yet the urge to buy near the top and sell near the bottom remains strong. Now, as writer Jonah Lehrer explains, researchers are beginning to look inside the head for the source of the irrational exuberance that drives markets to dizzy heights.

**Jonah Lehrer,** freelance writer

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In the early 1630s, tulips became a fashionable accessory in the Netherlands. This led enterprising gardeners to set up a futures market so that the promise of spring buds could be sold in the winter months. Before long, the tulip market was overwhelmed with speculators, which led to a steep rise in prices. At the peak of "tulip mania," a single bulb was worth ten times the annual salary of a skilled craftsman. And then, in February 1637, the bubble burst, with the value of some rare bulbs declining more than 99%. In many instances, the speculators ended up with expensive futures contracts they were unable to resell. All they got was a pretty flower.

While tulip mania might strike 21st-century investors as a ridiculous affair, the global financial system has proven to be extremely vulnerable to financial bubbles that are just as absurd and far more destructive. In the last decade, we have lived through the aftermath of the dot-com era – in which start-ups without business models were suddenly worth billions of dollars – and the real estate bubble, in which Las Vegas condos and Spanish tract homes tripled in value before they even had roofs.

The question, of course, is why bubbles are such a persistent feature of financial history. Some economists have argued that bubbles are a rational response to the booming market, as investors realize the rising prices are unsustainable, but still seek to profit (of course, not everyone sells before the bust). Other economists see the speculative frenzies as caused by market failures, such as too much liquidity or lax regulation. Unfortunately, these market failures have proven incredibly difficult to diagnose. Even at the peak of the real estate bubble, many serious-minded people insisted that the rising prices were rational. There was no bubble. There was only a boom.

### Markets mirror investors' minds

The inability of economists to fully explain bubbles has led many scientists to turn inwards. Instead of analyzing the macroeconomic indicators, these researchers want to identify the source of speculation inside the head, those mental quirks that lead us to bet everything on tulips and mortgage-backed securities. According to these scientists, financial manias reflect our deep-seated human flaws; the market only fails because the mind fails first.

Daniel Kahneman, a Nobel laureate and professor of psychology at Princeton University, proposes that bubbles begin when our ability to spot patterns goes haywire, so that people extrapolate the immediate past into the distant future. "We are natural pattern detectors," he says. "In fact, we're so good at seeing patterns that we often >

## Mind over mania

Speculative bubbles such as the "tulip mania" of the Dutch Golden Age are as old as the history of finance. They can cause incalculable damage, yet remain difficult to predict. Now, findings from science suggest that the human brain contains the key to both explaining bubbles and, perhaps one day, preventing them.

hallucinate them, which is what happens when we think that the price of something will always go up." And so we convince ourselves that the risky investment is actually risk-free: These sky-high prices could not possibly fall. Thanks to the new tools of modern neuroscience, we are now beginning to see where these errant patterns come from. Read Montague, a neuroscientist at Baylor College of Medicine in Houston, Texas, has spent the last few years trying to decipher the circuitry of irrational exuberance in the brain. His experiments go like this: A subject is given 100 dollars and some basic information about the state of the stock market. After choosing how much money to invest, the player watches as his investments either rise or fall in value. The game continues for 20 rounds, and the subject gets to keep his earnings. One interesting twist is that, instead of using random simulations of the market, Montague and his colleagues rely on real data from past bubbles: People "play" the Dow of 1929, the S&P 500 of 1987 and the NASDAQ of 1998. Because the investing game is played in an fMRI machine (or functional magnetic resonance imager – a brain scanner that measures changes in blood flow), the scientists could monitor the neural responses of investors during real-life bubbles and crashes. Montague's work comes under an experimental branch of behavioral finance called neuroeconomics that deals with how we make economic decisions. For further insight on the science and psychology of investing, see also the articles in this issue by Brian Knutson and Camelia M. Kuhnen on page 29.

#### Greedy brain cells

How did the brain deal with the fluctuations of Wall Street? Montague immediately discovered a strong signal that seemed to be driving many of the investment decisions. This signal emanated from areas of the brain dense with dopamine neurons, a type of brain cell typically associated with the detection of rewards. But these brain cells were not simply monitoring the rising share prices. Instead, they seemed to be scheming for ways to make even more money, to benefit fully from the boom. Consider this situation: A player has decided to wager 10% of his total portfolio in the market, which is a rather small bet. Then, he watches as the market rises dramatically in value. While people enjoy their profits, their ungrateful dopamine neurons seem to be fixated on the profits they missed, as the cells automatically compute the difference between the best possible return and the actual return (this is known as "fictive error learning" because it allows people to learn from "what if" scenarios). A big difference between what was and what might have been is experienced as a feeling of regret, and Montague found that in such cases, people are more likely to do something different the next time around. As a result, investors in the experiment naturally adapted their investments to the ebb and flow of the market. When markets were booming, such as the NASDAQ bubble of the late 1990s, investors perpetually increased their investments. To not invest was to drown in regret, to bemoan all the money that they might have earned if only they had made better decisions.

Montague argues that these computational signals emanating from our dopamine neurons are a main cause of financial bubbles. When the market keeps going up, people are naturally led to make larger and larger investments in the boom. Their greedy brain is convinced that it has solved the stock market – it has found the pattern that matters – and so they forget to think about the possibility of a loss. But then, just when investors are most convinced that the bubble is not a bubble – many of Montague's subjects eventually put all of their money into the booming market – the bubble bursts. The Dow >

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Photos: Mathias Hofstetter | Edward Caldwell

sinks, the NASDAQ implodes, the Nikkei collapses. All of a sudden, the same investors who regretted not fully investing in the market were now despairing of their plummeting net worth. "You get the exact opposite effect when the market heads down," Montague says. "People just can't wait to get out, because their brain doesn't want to regret staying in." At this point, investors race to dump any assets that are declining in value, as their neurons realize that they have made some very expensive prediction errors. This is when you get a financial panic.

### Looking for an early-warning system

While the fMRI data provides an interesting snapshot of brain activity during bubbles, Montague is determined to understand our investing decisions at the most fundamental level possible, which involves studying the activity of individual neurons. At first, these cellular measurements confirmed the obvious: our cells are greedy little information processors, and efficiently try to maximize our profits during the early phases of the bubble. When the cells notice that share prices keep on going up, they increase their rate of firing, which leads us to pour more money into the market. We are convinced the bubble is a boom.

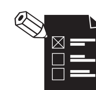
But then Montague discovered something strange. As the bubble continued to swell, a small circuit of dopamine neurons, located in a brain area called the caudate nucleus, started to get anxious. The cells dramatically reduced their rate of firing. And then, right before the bubble burst, these neurons typically stopped firing altogether. It is as if they were trying to warn people of the imminent crash, to get them out of the market. In fact, Montague notes that an investor who listened to these prescient brain cells would earn more than twice as much money as the typical subject, largely because he or she would get out of the market before it was too late. "It's crazy to think that there's a signal in our head that's smarter than we are," Montague says. "But that's what we found. The dang dopamine neurons were tracking the stocks like a glove."

### Knowledge, the best defense

While this data contains plenty of caveats – the scientists could only conduct the experiment with six subjects – it nevertheless provides important insights into how the brain makes sense of the marketplace, and why we sometimes get swept away by speculation. While our reward-seeking dopamine neurons help start the bubble, they are also uniquely able to predict the wretched ending (it remains unclear why these cells stop firing, although Montague thinks they are turned off whenever prices rise too quickly). Unfortunately, by this point, we are too captivated by our profits to care. Instead of listening to our dopamine neurons, we obey the urges of so-called higher brain areas like the prefrontal cortex, which are busy coming up with all sorts of reasons why this bubble will never burst. The mind is an argument, a chamber of competing voices, and a bubble occurs when the bellows of greed drown out those worried neurons telling us to sell.

Moreover, this tendency is exacerbated by other people. Montague has also found, for instance, that subjects in the investment game are extremely vulnerable to what he calls "the country-club effect," which occurs when we try to make more money than someone else (he simulates this effect in his experiments by having subjects compete against each other). "This is what happens when you're sitting around with your friends at the country club or watching cable TV, and everybody is talking about their huge profits," he says. "Those conversations are going to change the way you think about risk." Men seemed especially vulnerable to this foible: when they competed against strangers, they were much more likely to be swept away by the financial speculation.

Montague is virtually alone in studying bubbles from the perspective of the brain, which has not prevented him from publishing his articles in elite scientific journals. He hopes that, one day, the neuroscience of bubbles will help us stop the speculation before it spirals out of control. "The only way we're going to avoid the next bubble is by understanding why people start bubbles in the first place," Montague says. "The Fed should buy a brain scanner." In the meantime, Montague jokes that he could make a killing by using the current stock market in his next set of experiments. "Our dopamine neurons are running some pretty sophisticated algorithms," Montague says. "These experiments suggest that they know better than we do what's going to happen next." ■



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# The world according to Wall Street

Investor reaction to global events between 1925 and 2010 as reflected in the Dow Jones Industrial Average. Historical market patterns are just one among many considerations that go into financial analysis. But predicting market behavior is as much art as science.

Logarithmic scale

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6

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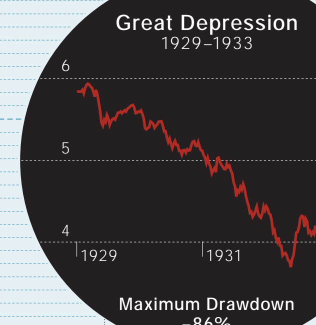

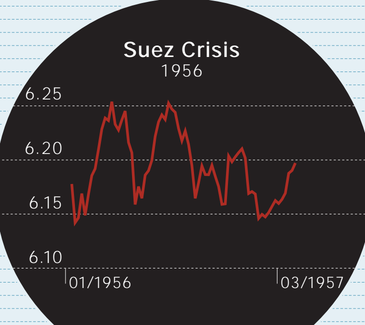


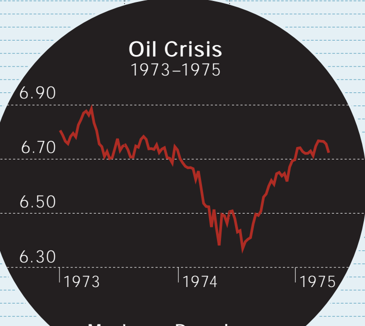

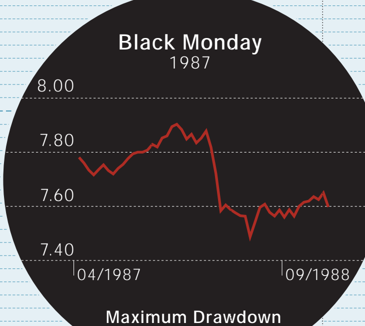


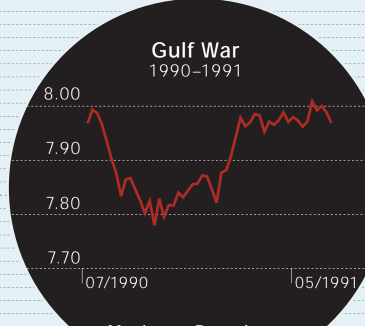

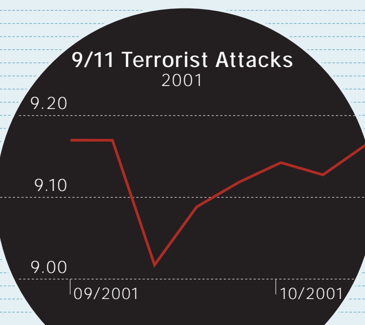


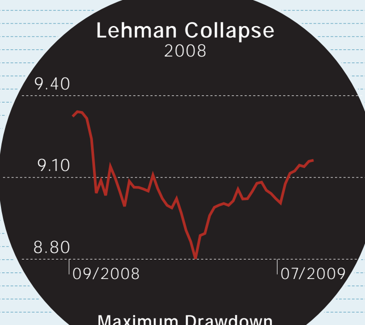


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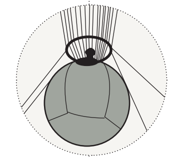
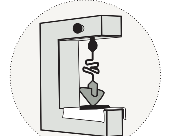


**Auguste Piccard rides to the stratosphere**
Together with Paul Kipfer, Piccard balloons to a record altitude of 15,785 meters in his first of 27 balloon flights. Later, he also pioneers tools for deep ocean exploration.

**John Maynard Keynes**
suggests a new economic theory. Keynes' belief in government intervention in fiscal policy proves influential in the aftermath of World War II. When the global financial crisis hits in 2007, his ideas enjoy a resurgence.

**Polyethylene goes into industrial production**
Plastics! The commercial importance of polyethylene was first recognized during World War II. Today, it is the most widely used plastic material for packaging.

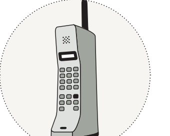


**Transistor invented at Bell Labs**
Small, cheap and light on power, this modest-looking device for boosting electrical signals heralds the start of the information age, remaking the world as we know it.

**Scaling Mount Everest**
Edmund Hillary and Tenzing Norgay become the first humans to reach the top of the highest mountain in the world. Thousands of people now make the trek each year, at a cost of 25,000 dollars per person.

**Birth control pill**
The first birth control method to safely inhibit female fertility, "the Pill" gives women sexual freedom and allows them to plan their families. In helping to redefine the role of women, the Pill opens the door to better education and careers.

**First heart transplant**
Christiaan Barnard conducts the first heart transplant on 53-year-old Louis Washkansky. Today, thousands of heart transplants are carried out worldwide each year.



**First mobile phone call**
Martin Cooper, a general manager at Motorola, rings a rival at AT&T Bell Labs from the streets of New York City using a handset the size of a brick and weighing two kilograms.

**Internet browser developed**
At CERN, near Geneva, Tim Berners-Lee writes an internet system that he calls the World Wide Web. Today, with over two billion users, the Web has become a way of life.

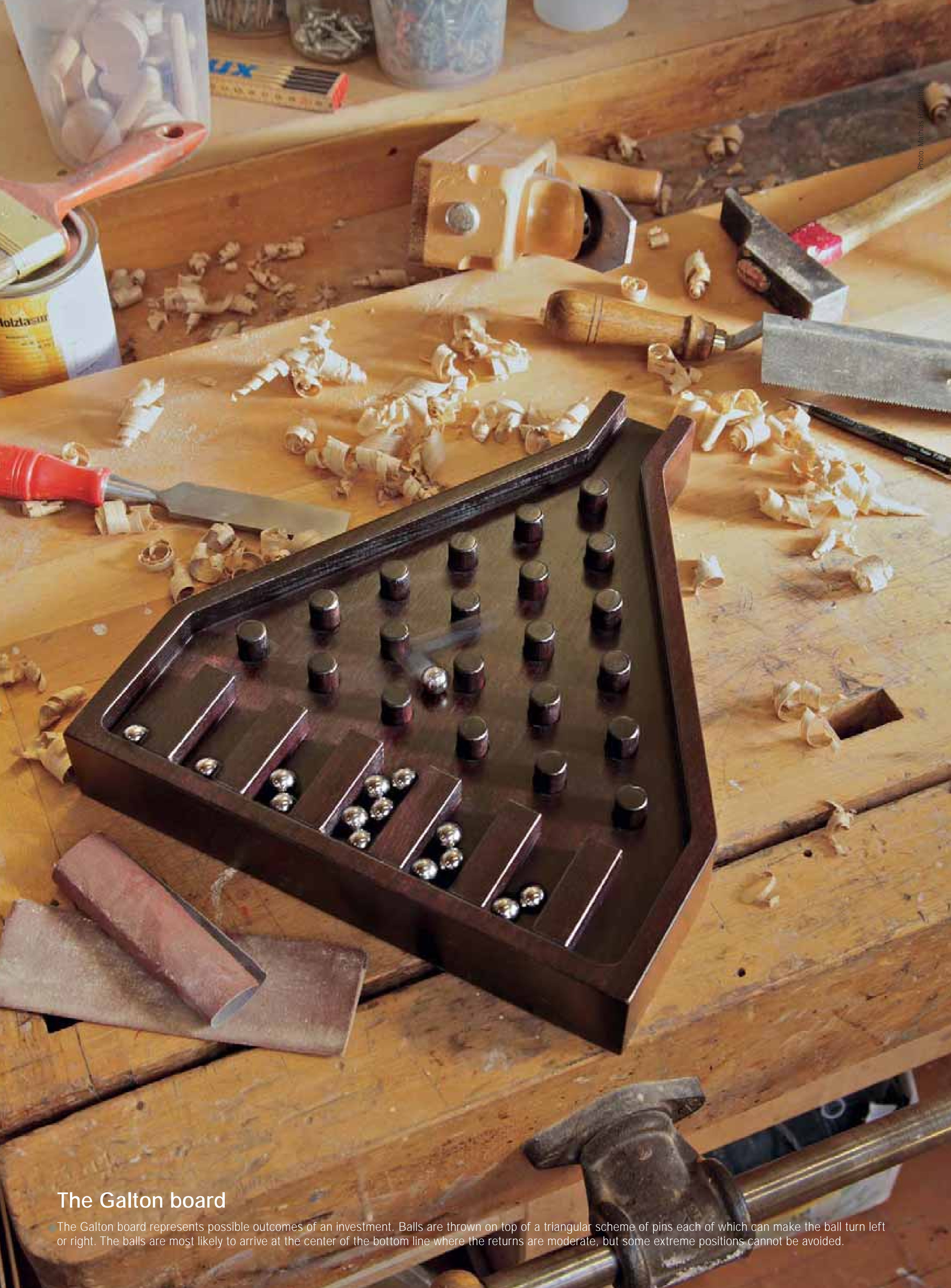
**A sheep named Dolly**
The first mammal to be successfully cloned from an adult cell is born in Scotland. The discovery sparks a worldwide debate on the ethics of cloning. Dolly dies in 2003 and is preserved in a museum.

**Introduction of the euro**
The goal of the euro was to make trade easier between EU countries. In 2011, though beset with growing pains, the euro is the second-most traded currency in the world after the US dollar.

**"Book of life" decoded**
Sequencing the complete genome of an individual human represents a landmark achievement in science and technology. The promise of "personalized medicine," however, has yet to be realized.

**More than half of all human beings live in cities**
as of 2007, up from 48% in 2003. Urbanization increases prosperity but also places great demands on infrastructure and on scarce resources such as water and energy.

Source: Bloomberg, Credit Suisse



## The Galton board

The Galton board represents possible outcomes of an investment. Balls are thrown on top of a triangular scheme of pins each of which can make the ball turn left or right. The balls are most likely to arrive at the center of the bottom line where the returns are moderate, but some extreme positions cannot be avoided.

# Investors: Ideal and real

Traditional finance models are based on ideal investors who are rational, non-impulsive and endlessly patient. In the real world, however, investors make all kinds of mistakes that are part and parcel of being human. Thorsten Hens explains how behavioral finance can help investors to recognize psychological traps and make more rational investment decisions.

**Prof. Dr. Thorsten Hens**, Head Department of Banking and Finance, University of Zurich

Behavioral finance studies the real-world conduct of investors and markets. Today, this may seem a little obvious, but prior to the emergence of the field, and particularly in the relatively stable decades following World War II, the working models of finance assumed that investors were completely rational and markets efficient. The inadequacy of those models first became evident in the USA at the end of the 1990s, when many people were caught up in the massive boom and bust known as the dot-com bubble. In 2002, Daniel Kahneman and Vernon Smith shared the Nobel Prize in economics "for having integrated insights from psychological research into economic science." Even as they were collecting their prize, another bubble (housing, this time) was in the making. When it burst in 2007, it triggered a global financial crisis. Evidence of irrational markets has now become so overwhelming that the general public is eager to learn what the new research has to teach. Behavioral finance is primarily concerned with behavioral biases (mistakes typically made by investors and how to avoid them) and market anomalies (market inefficiencies and how to exploit them). This article will focus on behavioral biases and what they mean for private investors.

A behavioral bias is a deviation from rational behavior. According to rational behavior theory, an ideal investor knows his assets and liabilities, determines his goals, then cool-headedly assesses the opportunities and risks of various investment opportunities. Moreover, such an investor naturally discounts future payoffs from assets to present values based on the interest rates assigned to the relevant time horizons. Finally, he reassesses the opportunities and risks of his choices as new information arises.

Suppose, for example, an investor has one million Swiss francs, half of which he will need for his children's education. His goal is realistic given the current market situation. He wants to achieve a return of 2% per year over the next ten years. The bottom line is that he must remain able to pay for his children's schooling. He begins by putting aside half a million francs in risk-free assets such as inflation-indexed government bonds of AAA-rated countries. In order to move beyond this minimum requirement for his investments, he studies the risks and returns of a large set of risky assets. He then builds a well-diversified portfolio that is expected to achieve at least 4% per year over the next ten years. As time goes on, he loses little sleep over >

# Two sample questions from a behavioral finance diagnostic test

Question 1

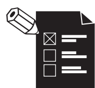
**Suppose you bought an asset for 100 and now it is priced at 80. What do you typically do in this situation?**

- ○ I increase my position since the asset is now cheaper.
- ○ I sell the asset since I am losing money with it.
- ○ I do not sell the asset in order not to realize my loss.
- ○ I reconsider my reasons for buying the asset.

Question 2

**Suppose you bought an asset for 100 and now it is priced at 150. What do you typically do in this situation?**

- ○ I increase my position since I am gaining money with it.
- ○ I sell the asset in order to realize the gain.
- ○ I reconsider my reasons for buying the asset.



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portfolio gains and losses since he is always looking ahead, assessing the opportunities and risks of his investments, and creating a new portfolio if needed. Generally, however, market movements are not significant enough for him to change his asset allocation fundamentally. Instead, he tweaks the allocation, making sure that the proportions remain the same. Note, too, that this investor does not change his target return based on the ups and downs of the markets because he has a long-term investment horizon.

**The behavioral investor**

Given the same situation, behavioral biases may lead a flesh-and-blood investor to make the following mistakes. First, he may fail to accurately assess his assets and liabilities. He may also be reluctant to plan a decade ahead. This is especially true if the investor suffers from "hyperbolic discounting," which means that he values the present more than the future. He may agree to manage his wealth properly next year. But when next year comes, he will postpone the planning for another year. He behaves like a child which, when offered one chocolate bar next Saturday or two chocolate bars the following Sunday, chooses the latter option, but when offered one chocolate bar today or two tomorrow, opts for the former date. The error of the choice is clear when Saturday comes and the child reverses its earlier preference and demands one chocolate bar immediately. Hyperbolic discounting is largely what leads people to start increasing their pension savings when it is already too late, e.g. when they have already turned 50. Increasing pension savings means giving up consumption today for consumption some time later – a tough decision that is likely to be postponed, even if agreed to many years previously.

The second error that a behavioral investor often makes is to set his target return "adaptively," in other words, based on recent experience rather than a forward-looking interest rate on, say, government bonds. After a year like 2008, the investor will be satisfied with not losing any further money. Yet very soon, influenced by the quick recovery of the financial markets, he again targets 20%. The adaptive expectations of clients are a challenge for advisors because calibrating a portfolio to this bias means recommending pro-cyclical investing, which on a year-to-year basis is not beneficial. Moreover, in the course of the investment process, the behavioral investor will experience gains in his portfolio as rewards that will make him more confident and willing to take risks. Similarly, he will see losses as punishment, which will make him more anxious and risk-averse. The practical effect of this is to reinforce pro-cyclical investment, whereas a more prudent rebalancing would have him follow a counter-cyclical strategy (i.e. sell assets that have made gains and buy more of those that have made losses).

Finally, the behavioral investor is typically distracted by the arrival of irrelevant information, such as day-to-day news coverage of the stock market. Consequently, he might be tempted to make overly frequent switches to his portfolio.

**How can behavioral finance help?**

Applied research in behavioral finance has devised three steps for becoming a more rational investor. The first is a rigorous diagnostic test that provides an investor with scientific feedback about his investing strengths and weaknesses. Such tests are based on "psychometrics," i.e. on millions of observations of investor characteristics that are grouped into a few factors for investor success using statistical methods. Comparing the answers people give to these questions with their investment success shows that those who choose to reconsider

Photo: Thomas Eugster

the reason for buying the asset are the most successful. All the other answers are based on reasoning that is not forward- but backward-looking. It is naturally a pity if one loses with an investment and it is great if one profits but, for the future success of the investment, previous gains or losses are mostly irrelevant!

Behavioral finance has also developed a means of presenting investment choices so that investors really understand them and gain confidence in making decisions. For example, investors are helped by simulations that let them experiment with possible return outcomes of an investment. In general, this exercise builds confidence in the investment process and alleviates subconscious fear of incurring investment losses, which is particularly important in staying the course in difficult times. Indeed, many studies show that aborting an investment strategy prematurely is one of the most detrimental mistakes investors make. Showing investors the historic returns of an investment is actually not useful. People tend to focus on the final result of the investment, downplaying the fact that, if the investment had been sold earlier, its outcome would be uncertain.

**Something old, something new**

In comparing various simulation tools, recent research by the University of Mannheim and the University of Zurich has rediscovered a very old tool from statistics known as the Galton board. The Galton board visualizes the possible turns an investment can take. If a ball falls on a pin and turns right, the investment has gained; if it turns left, it has lost. The balls at the bottom of the board show the investor the relative frequency of the outcomes. Balls lying far to the left have lost many times – but not very many will end up there! Most balls will arrive in the middle because they have turned left as often as they have turned right. Visualizing the possible future gains and losses this way helps investors to understand that losses can happen. But they also see that extreme losses are rare, giving them more confidence in investing in risky assets.

Finally, behavioral finance has been investigating how best to design risk-profiling tools. Such tools are a regulatory requirement for European banks. But innovative banks in Switzerland also see risk profilers as an opportunity to improve the quality of the advice they give their customers. At the University of Zurich, we are currently developing state-of-the-art risk profilers. In a sequence of laboratory experiments, investors make payoff-relevant decisions after having answered variations on and combinations of questions. We have been able to successively improve the result of the risk profiling by filtering out the set of questions that leads to the highest investment returns. One important finding of this research is that eight questions are sufficient to recommend a suitable investment strategy. Among those eight questions, three focus on different aspects of risk: losing money, uncertainty about the outcome of the investment, and aborting a strategy in the face of high losses.

Investing in financial markets is a difficult task for which evolution has not appropriately equipped us. We are inclined to follow the herd and to invest pro-cyclically, whereas we would do better to go against the flow. We fear the worst possible outcome, but forget that it is unlikely, and so on. New research on behavioral finance has developed instruments to overcome these predispositions, helping us to achieve returns that are worth the risks we take. ■

**Thorsten Hens is Professor of Financial Economics and Director of the Swiss Banking Institute at the University of Zurich. His research interests include evolutionary and behavioral finance. His consulting experience includes applying behavioral-finance models and devising trading strategies for private banking, product development and asset management.**

**Further reading:**
**T. Hens and K. Bachmann, "Behavioral Finance for Private Banking," Wiley-Finance (2008).**

Investment behavior

# Gender and money

Research consistently shows that women exhibit lower levels of satisfaction, confidence and optimism than men when it comes to investing. This negativity, it seems, has little to do with innate biological differences and a lot to do with a lack of experience and good advice.

**Meike Bradbury,** Global Investment Delivery, Credit Suisse

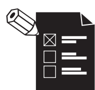

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Photo: Thomas Eugster

Meike Bradbury, **who works at Credit Suisse's Global Investment Delivery unit, is doing research in gender-specific wealth management advice. She has a degree in economics from the University of Zurich and is currently completing a PhD thesis on behavioral finance.**

Boston Consulting Group (BCG) has calculated that women controlled an estimated 27%, or about USD 20 trillion, of the world's wealth in 2009. Despite this very substantial client base, female clients tend to receive less attention than men. According to BCG[1], more than half of the participants in a survey of 12,000 women in 22 countries thought that financial advisers could do a better job of meeting the needs of female clients and nearly a quarter thought wealth managers could significantly improve how they serve women.

A Merrill Lynch Investment Managers Survey[2] carried out in 2005 found that, in general, men do indeed seem to enjoy investing more than women, perhaps because they have more experience in making investment decisions. (Experience contributes to a greater readiness to assume risk, which reinforces the desire to invest, and so forth.) Researchers at the University of Mannheim recently found that after using a risk-simulation tool that informs investors about a stock fund ("risky fund"), men and women alike tend to show decreased risk aversion, i.e. they are willing to assume more risk in the context of investing without lamenting their choice when the outcome is negative. Increased allocation to the "risky fund" can be explained by a better understanding of financial markets and increased confidence in making financial decisions.

## Testing stereotypes

Even twenty years ago, researchers at the University of California demonstrated that confidence plays a major role in risk-taking behavior. In 2010, Barbara Döbeli and Paolo Vanini reported in the "Journal of Banking and Finance"[3] that if an investment opportunity lacks clarity and transparency, women are less willing to take a risk than men. Moreover, a 2007 survey by the ShareBuilder Securities Corporation[4] concluded that women are generally less confident than men when it comes to making investment decisions, despite the fact that, more often than not, they oversee the family budget and are responsible for paying the bills.

Together with the University of Zurich's Department of Banking and Finance, Credit Suisse Global Investment Delivery is investigating how to raise investor confidence and understanding by assessing individuals' true risk preferences. (Risk preferences describe a person's willingness to take or avoid risk in financial choices.) Behavioral finance – and we as a bank – are particularly interested in

understanding how people make decisions and where they may have biases. The more complex the risk – such as in financial decision-making – the more difficult it is to predict how people will react.

During an initial run of our current experimental series, we have found that experience simulation helps investors to make complex investment decisions, such as selecting structured products. The simulation randomly selects returns from a factitious index (the underlying) and calculates the corresponding payoff. We have found that women revise their investment decisions more often than men after learning how financial markets behave. In other words, they appear to be more adaptive than men and therefore profit more from this kind of information. Moreover, the Merrill Lynch survey cited above found that women learned from their investment mistakes and were much less likely than men to repeat them. Evidence thus indicates that women make good and profitable investment decisions when they have the confidence to do so.

In evaluating women's investment decisions prior to experience simulations, it became clear that they showed a stronger aversion to loss than men, preferring to avoid losses rather than make gains. However, following the simulation exercise, the gender gap decreases, and the investment preferences of women and men become more closely aligned. These results are significant because the common stereotype that women are more risk-averse than men can have far-reaching consequences: financial advisers may, for example, be inclined to preselect asset allocations or financial products with low risk and low long-term return possibilities. A frequent source of frustration for women cited in the BCG study concerned financial planners talking down to them or providing little in the way of information aside from the basics.

### Learning to change

In a recent paper entitled "Stereotype Threat Affects Financial Decision Making,"[5] Priyanka Carr of Stanford University and Claude Steel of Columbia University showed that negative stereotypes – about women being irrational and illogical – influence how both women and men make financial decisions. Their experiments revealed that when negative stereotypes were evoked, women made more cautious financial decisions, whereas men became more risk-seeking. Women were more likely to forgo lucrative opportunities for the sake of avoiding losses and risk. However, when negative stereotypes about women did not come into play, no gender differences in financial decision-making were apparent.

Both research and real-world observations support the idea of a gender gap in investment behavior that appears to be rooted in differing levels of confidence when making financial decisions. But experience can bolster women's self-confidence by improving their understanding of the underlying risks involved in investment products. We believe experience simulation is the most effective technique currently available for informing and training inexperienced investors. Some banks have already taken steps to introduce such methods. Credit Suisse employs a risk-simulation tool (mainly in Europe and Asia) that allows users to track the return trends of a portfolio during previous extreme market situations. The ultimate goal is to transform behavior, and the action it triggers, from unconscious fear into manageable concern. ■

[1] "Leveling the playing field: Upgrading the Wealth Management Experience for Women," BCG Women in Wealth Management Survey, July 2010; BCG analysis
[2] M. Frank, S. Bishop Tiller, "When it comes to Investing, Gender a Strong Influence on Behavior," Hindsight 2 Insight, Merrill Lynch Investment Managers (MLIM) Survey, 18 April 2005
[3] B. Döbeli, P. Vanini, "Stated and Revealed Investment Decisions Concerning Retail Structured Products," Journal of Banking & Finance (2010)
[4] ShareBuilder Women & Investing Survey, 2007
[5] P. Carr, C. Steele, "Stereotype Threat Affects Financial Decision Making," Psychological Science (2010)

"Our simulation found that women show a stronger aversion to loss than men, preferring to avoid losses rather than make gains."

Women in finance

Four women who are founders and CEOs of investment companies in Saudi Arabia, the US and Iceland describe their approach to finance.

**Giselle Weiss**, freelance writer

# Diversity begets diversity

A lifetime of thinking for herself has led **Renée Haugerud**, founder and Chief Investment Officer of Galtere, to some pretty strong ideas about women investors.

Renée Haugerud is founder and Chief Investment Officer of Galtere Ltd., New York. She managed trading desks at Cargill Inc. and at institutions such as NatWest Markets before striking out on her own. She has a special interest in the psychology of macroeconomic trends.

Giselle Weiss: Why are women traders and portfolio managers relatively rare?

Renée Haugerud: There's no single answer. Aside from a brief period during the 1970s when companies were actively recruiting women in anticipation of affirmative action quotas, women typically are steered away from portfolio management into non-revenue-producing streams such as financial analysis, economics, research and sales. The sheer predominance of men, too – and the survival-of-the-fittest culture – can be off-putting. Finally, for whatever reason, women have less confidence in their math skills.

Did you set out to trade?

Renée Haugerud: No! I didn't know it existed. I actually grew up in a jail, in Fillmore County, Minnesota. My father was a sheriff. We also had a little farm on the outside of town, where my father raised corn. One day when I was five, he took me up in a plane to check the corn, and as we did so, he explained the futures market to me. To think that you could sell corn without owning it and make money on it mesmerized me. Later, working as a temp at Cargill, I discovered there was such a thing as a grain trader, and I knew I'd found my calling. I worked for a decade or so at Cargill, then left and eventually started my own fund.

Why?

Renée Haugerud: I wanted to do things my way. I have a distinct approach to trading. I really focus both on the science and the art. I knew I had a great strategy and I love running my own business. I also wanted to attract more women to the business. I think women are great traders. Not just good traders. Great traders!

In fact, you have started a program at the University of Tennessee to increase the number of women hedge fund traders.

Renée Haugerud: Yes. My husband and I donated funds to the University of Tennessee that the school has agreed to put toward a studies center called the Finance for the Future initiative. The center is not exclusively for women – it is open to all – but courses will be taught from the female perspective. We want everybody to start thinking with the right side of their brain. We'd like to make both men and women better traders.

So what makes women such good traders?

Renée Haugerud: It isn't that women

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Photos: Image provided by Galtere Ltd. | Gunnar Svanberg

are necessarily "smarter" than men that they make as good or better traders. I think it's because we avoid the mistakes. In 2001, researchers at the University of California showed that men do more transactions than women. That raises their net cost of investing and lowers their returns. In addition, men are more likely to sell at the bottom or buy at the top than women are. We're not as impulsive. We don't typically react to hot tips. We want to understand what we are doing in the broader scheme of things.

How do gender roles play out in your team?

Renée Haugerud: I believe everybody has to be able to do everything. I ultimately make the portfolio decisions in my fund because I'm the captain of the ship. But you need thinkers, researchers, doers, executors and risk managers. We definitely have a team approach. And the key issue is diversity. Your portfolio is only as diverse as your trading team.

How did you get interested in behavioral finance?

Renée Haugerud: Observation and experience. I always thought investing was very much a numbers game. But then I started seeing that you can have a whole set of criteria specifying why something should happen, and all those criteria are met, and the market still goes the other way.

Several of your colleagues have talked about risk. Do you need to take risks to be a good trader?

Renée Haugerud: Yes, you do. But everything is a risk. If you don't do a trade, you're taking a risk. You can take calculated risks, though.

Is that something you have to teach women?

Renée Haugerud: I think many women are just as willing to take risks as men. Once they realize it. I tell women, "It's your obligation to get into this business." And to stop waiting for an invitation. Finance is part of the world economy. We should be involved. We should make money, claim our share of the GDP pie and spend it the way we want to, which I happen to think would be more focused on domestic issues, health care and education. ■

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# Daring to ask the "silly" questions

Much effort has been expended wondering whether men should behave more like women or women more like men. "They're different," says **Kristin Petursdottir**, CEO and cofounder of Audur Capital. Why not make the most of it?

Kristin Petursdottir is CEO and cofounder of Audur Capital, Reykyavik, Iceland. Previously she was an executive at Kaupthing Bank for ten years. She has a BA in economics and an MBA in international business, and was on the national handball team for Iceland.

Giselle Weiss: Is there anything particular about Iceland that makes being a woman investor in that culture different from, say, New York City or London?

Kristin Petursdottir: The culture of Icelandic banks as it was, and as they were built up over the last decade until the crash, was very similar to what you see in most other places. In other words, it was a culture lacking in balance and diversity. And that culture exaggerated the negative side of the crisis because a lack of critical thinking led to herd behavior. Other than that, I don't think being a woman in this sector here is different from anywhere else. And I have worked in Norway and London. Most of the time, I was the only woman on the management team, even in the team I was heading.

Yet you liked it.

Kristin Petursdottir: In the beginning, I thought investment banking sounded very, very interesting and exciting. And I still do. I never asked myself whether being a woman might be an impediment. I am very competitive, and I just pretended I was one of the boys. I did quite well. But once I crossed the "magic 40," I realized that women bring many values to the table that can benefit any company, not only the financial sector. Consequently, I think the corporate world should embrace the differences between men and women.

For example …?

Kristin Petursdottir: Women tend to have a broader definition of success. They think more longterm. They have a more acute sense for people. And, in business today, where human capital is many companies' biggest asset, being good with people really matters. In addition, women are becoming such a major economic and financial force that companies need to have women at the decision-making table. If you have only men, and you have a growing female market out there, something is missing. I am not saying that we are better than men. I am talking about balance.

How do the feminine qualities you mention play out in actual investing behavior? >

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Kristin Petursdottir: It is always difficult to generalize. But there are certain differences. The biggest is that women want to understand what they are investing in. If they cannot fathom the structure or risk profile of a company or a product or a service, they are less likely to invest than men. Another way of putting it is to say that women dare to ask the silly questions. In my experience, men are more willing to invest in something they think they understand. And they are less likely to ask questions.

Is that to say women are risk-averse?

Kristin Petursdottir: Not risk-averse, but risk-aware. Women want to understand, whereas men may take on risks they don't understand. Women investors are more long-term oriented. They are less willing to take on huge risk for a huge upside in the short term. They prefer to see things grow over time.

What would you change in the existing culture?

Kristin Petursdottir: It is not enough to put one woman in the boardroom or on the trading floor. Many more will be needed to muster the influence required to change things. Iceland, of course, went horribly wrong. But you see the same pattern everywhere else. The financial sector took things way too far. Creating more of a balance would be a step in the right direction. Everyone stands to gain by having more women involved in all areas of their operations.

What new trends do you see in investing?

Kristin Petursdottir: Today, women, and increasingly men, are looking for investment opportunities that have a triple bottom line. They are looking for companies that are not only profitable, but are also doing the right thing. Young people especially are in tune with this way of thinking. But interestingly, I find that older people – older men! – also get this concept of a wider horizon as opposed simply to short-term profits.

Can investors drive change?

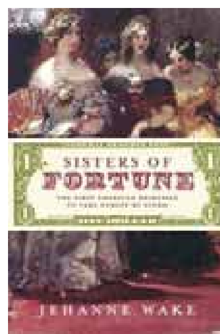
Kristin Petursdottir: They can. In the past, the model has always been that people create a business, make a lot of money building it up, become ultrarich, and then turn into philanthropists and give their money away to good causes. Which is fine. But I sometimes ask myself, "Why on earth not start by doing good business?" Why not just decide to earn a little less and help society to grow and prosper around your business? That is a thought that I have. ■

**"I think women are great traders. Not just good traders. Great traders!** We should be involved." Renée Haugerud

"Women tend to have a broader **definition of success. They think more long-term."** Kristin Petursdottir

**"Do you just want to make money, or do you also want to create jobs, real** business clusters and related industries or sectors?" Nahed Taher

"It is harder to raise capital as a woman. On the other hand, women do have better intuition than men. And that is **beneficial as an investor."** Lauren Templeton




**Jehanne Wake, "Sisters of Fortune: The First American Heiresses to Take Europe by Storm," Chatto & Windus, August 2010: Women and risk-taking in the 19th century**

Marianne, Bess, Louisa and Emily Caton, and their female friends, were risk-taking "lady speculators." Bess, for instance, bought 1,020 British pounds' worth of Spanish Cortes bonds at the bottom of the market in 1832: "I shall clear at least a thousand pounds by my speculation" for "whatever party prevails in Spain the bonds will rise."

When the Spanish Regent granted a constitution in 1833, Bess increased her holding at 14, directing Barings to buy more: "And therefore if you wish sell my Peruvian, I should like you to invest them in Spanish. "The bonds had risen to 36 when, in 1834, the Regent's brother-in-law tried to seize the throne and the bonds fell to 31. Britain supported the Regent and, by April 1835, the bonds were at 47. Bess and her friends decided to take a profit in May at 60. Suddenly all Spanish stock plunged from 72 to 50 as Rothschild, the greatest holder, turned bear and the "Spanish panic" of 1835 was under way. Within a week, "the ruin was so comprehensive" that over half the members of the stock exchange had defaulted.

# Focusing on the long term

Investment has to be about more than profit. **Nahed Taher**, CEO and founder of Gulf One Investment Bank, talks about taking the broad view.

**Nahed Taher is CEO and cofounder of Gulf One Investment Bank in Jeddah, Kingdom of Saudi Arabia. She is the first woman to head a Middle Eastern bank. She has a PhD in monetary economics from Lancaster University, UK. In 2010, the "Financial Times" ranked her 24th among the top 50 women in world business.**

Photo: Hany Musallam

Giselle Weiss: Is it hard for women to become investors in Saudi Arabia?

Nahed Taher: Not really. In the past, women tended to invest passively. They preferred simple things, like buying a building and collecting rent on it. Now, as they become more educated, they are keen to add value and to enjoy being part of the business world. Consequently, we are seeing increasing numbers of women coming into the bank to invest.

How did you become an investor?

Nahed Taher: When I returned to Saudi Arabia after doing my PhD in the UK, I was eager to add value to the banking system as a way of helping the economy. At the time, Saudi Arabia had only retail banks. National Commercial Bank, which is the largest bank in both the kingdom and the Middle East, offered me a senior position. I was the first woman hired among 4,000 men. I stayed for three-and-a-half years, and then I quit (in 2006) to start my own investment bank. Saudi Arabia had no investment banking licenses at the time, so I decided to begin in Bahrain, which had long experience in that sector. Later, I obtained a license in Saudi Arabia as well.

Your project was unique in the Middle East.

Nahed Taher: Yes. The bank I started was an infrastructure bank, which means it focuses only on transactions in specific sectors, such as transportation, roads, ports, airports, water, electricity, carbon emissions, health and education. The bank is not about real estate or financial instruments. We are a pure capital investment bank.

Does that reflect your investment philosophy?

Nahed Taher: Investment must be based on real assets. Even before the financial crisis hit, I could see that real estate, for instance, was way overleveraged, in the Arab world as well as in the US and other advanced economies. Moreover, assets must be valued rationally and not simply serve as a mechanism for increasing bank profits. You don't need money to make money. You need some money, but above all you need creative thinking. You also have to be willing to invest in human capital.

Why is infrastructure investing so important to you?

Nahed Taher: It's closely linked with socially responsible investments, by which I mean things that create jobs or help to build an economy in a sustainable fashion. Investment must be in line with human needs, not linked solely to economic cycles and the availability of financial instruments. But that requires hard work, and in the past, people have been lazy. They are used to making money easily.

In what way has your background shaped your attitude toward investing?

Nahed Taher: I actually grew up in Texas, and then moved to Kuwait, where my father headed the Organization of Arab Petroleum-Exporting Countries. My father used to worry about the danger of relying purely on an oil-based economy. And he was right. From the time I was a young girl, I determined one day to go into finance and investment to help change the world for the better.

Do you hire exclusively women?

Nahed Taher: No. Qualification comes first. I hire people, either women or men, who can add real value to the business and are committed to working hard and to collaborating with others. I issue shares as bonuses so that, over time, our employees become owners of the bank.

In your experience, do women invest differently than men?

Nahed Taher: One very important difference I have observed is that women focus more on the longer term. They want to see real investment happening. Men like quick returns – dollar signs, hit and run – and are not attracted by socially responsible investing as much as women are. That's in general, mind you. Individual cases differ.

What is the problem with focusing on dollar signs?

Nahed Taher: It can keep you from doing business right. A business based on infrastructure and real assets takes time to show returns. It's actually very profitable, even while being sustainable, but you have to be willing to wait. I find, too, that a focus on money can hinder vision. You have to ask where your business is going. Do you just want to make money, or do you also want to create jobs, real business clusters and related industries or sectors? ■

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# Risk and return go hand in hand

"Simply assuming that women are more risk-averse than men is misleading," says **Lauren Templeton**, CEO of Templeton Capital Management. Experience plays a hand.

**Lauren Templeton is the founder and president of Templeton Capital Management, LLC in Chattanooga, Tennessee. She has a BA in economics from the University of the South, sits on several advisory boards and is coauthor of "Investing the Templeton Way," an investing business book.**

Giselle Weiss: You began your investment career at a young age.

Lauren Templeton: Sir John Templeton was my great uncle. He seeded a fund for me with 30 million dollars in 2001, when I was 24 years old. It was like managing a hedge fund with training wheels. Sir John knew that a young person would have a hard time controlling her emotions at her first go at managing a large portfolio. So I had a lot of rules and guidelines to follow. For example, the fund was set up so that I couldn't sell at the bottom of the market. Over the years, as I became a more experienced investor, my skin thickened, and I learned to stomach the volatility in the markets and to take advantage of it.

Did your uncle caution you in any way because you were a girl and not a boy?

Lauren Templeton: Never.

How would you describe your own philosophy and approach to investing?

Lauren Templeton: We're bottoms-up stock pickers and value investors. Our motto is to buy at the point of maximum pessimism. A good example would be that we went in and purchased three Mexican airport operators during the swine flu crisis. Our stocks fall into either of two categories: they are extremely unpopular for a temporary reason, like the Mexican airport operators, or they're boring, neglected by Wall Street, and are trading at low valuations.

What does your approach have to do with behavioral finance?

Lauren Templeton: Behavioral finance and value investing are extremely compatible. There's only one way to get a bargain, and that is to buy what others are selling. That is a very difficult thing to do psychologically. It can be unnerving to step into a negative situation and do the opposite of what everybody else is doing. Humans are hardwired to herd. But that is not the way to achieve superior investment results. You have to train yourself to go in and buy when others are selling. And you have to be a great student of behavioral finance to learn where your psychological pitfalls are and how to overcome them.

How can you do that, if humans are hardwired to herd?

Lauren Templeton: It's extremely difficult. I think that I'm a good investment manager because I have learned how to control my emotions. I have my flaws, but I'm aware of them. And I set up policies and procedures at my company that assist me during times of psychological duress. So, for instance, we keep a wish list of securities in a desk drawer that currently aren't trading at valuations where we would purchase them. When the market falls, we're prepared in advance and can go in and get them at deep discounts. We also have limit orders out on those stocks. So if a stock falls 30%, and it becomes psychologically difficult to want to step in and buy the stock because everybody is selling it, we are probably already executed on it.

How does the investing behavior of women differ from that of men?

Lauren Templeton: There have been some studies on this subject. In the late 1990s, Terrance Odean and Brad Barber at the University of California analyzed the brokerage accounts of 35,000 households and found that men traded 45% more frequently than women, generally as the result of overconfidence. And recently, Vanguard went out and looked at about 3 million of their IRA account holders and found that men were more likely to sell at the bottom than women. Indeed, my own experience bears out that, generally speaking, overconfidence and risk-taking are less typical of women than of men.

To what extent does being a woman give you an edge?

Lauren Templeton: It's a mixed bag. It is harder to raise capital as a woman. On the other hand, women do have better intuition than men. And that is beneficial as an investor. Any way you can distinguish yourself from the crowd is positive. The fact that there are maybe only two dozen women hedge fund managers in the world is actually a positive distinguishing characteristic.

In terms of appetite for risk, would you say that women have to learn to take more risk? Or that the market has to learn to de-emphasize the importance of risk?

Lauren Templeton: Risk and return go hand in hand. I said earlier that men typically are more aggressive risk-takers than women, but I don't like to generalize. The appropriate level of appetite for risk really depends on the situation. ■

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The neuroanalyst
**Brian Knutson**, Professor of Psychology and Neuroscience, Stanford University

# Probing the investor's brain

We know from investor psychology that individual financial decisions are influenced by emotions. But what is it about the brain that causes us to behave that way? Brian Knutson explains how research may help scientists to quantify people's emotional responses as they anticipate financial outcomes and to reconcile such measurements with the decisions they make.

Recent global market events (including the US housing bubble and its subsequent collapse) highlight gaps between economic theories and lay intuition. To economic theorists and laypeople, economic actors look completely different – either rational and reflective or emotional and impulsive.

Traditional finance models imply that people invest based on the statistical qualities of risky options, for example, average past returns. These models further predict that individuals seek to maximize returns and minimize risk. But behavioral research suggests that people's actions do not always conform to these predictions (see companion piece by Camelia Kuhnen). The same person may both buy insurance and gamble, in other words, simultaneously opt for low returns and high risk.

Can research bridge the gap between theory and data? While reflective thought is hard enough to measure, emotional impulses are even more dynamic and fleeting. Technological advances, however, are giving researchers new insights into the interplay between passion and reason. In the past decade, improvements in neuroimaging techniques have allowed researchers to look deep into the brain on a second- >

The behavioral economist
**Camelia M. Kuhnen**, Associate Professor of Finance, Kellogg School of Management, Northwestern University

# How we think about money

Investors are only human, and as such, their portfolio choices are colored by the same emotions that drive other areas of their lives: overconfidence, fear, denial and a preference for good news. Yet financial models typically fail to take these characteristics into account. Camelia M. Kuhnen explores the psychological motives behind people's response to risk and reward.

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What determines people's investment decisions? Some economists maintain that understanding the distribution of possible asset prices in the future should enable people to calculate expected returns and return volatilities. Moreover, they can select an efficient combination of assets to achieve the best possible outcome for the amount of risk they are willing to bear in their portfolios. But is that really how portfolio choices are made by individual investors? Research in psychology, behavioral finance and nowadays in neurofinance is providing us with important insights regarding how people think about money.

Investors are fickle, as shown in a series of papers by Terrance Odean and Brad Barber at the University of California, Berkeley, and the University of California, Davis. One major motivator is overconfidence. Investors who are convinced that they can beat the market typically pick a few stocks and trade them repeatedly, pay a lot in transaction costs and in the end do worse than those who have a passive, well-diversified portfolio. Overconfidence also leads investors to put their money in mutual funds that have done well in the previous couple of years, even though these funds subsequently tend to un- >

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## Great expectations

Research shows that ancipating financial gains activates the same areas of the brain involved in our emotional response to sights, smells and tastes we perceive as positive. Likewise, anticipating financial risk activates areas of brain associated with negative emotional responses such as distaste or anxiety.

to-second basis. Thus, investigators can isolate not only how the brain reacts to financial outcomes but also how it anticipates those outcomes.

Two findings have repeatedly emerged in our and others' research. First, when people anticipate financial returns (in the form of expected gains), deep brain regions (such as the nucleus accumbens, which is rich in the neurotransmitter dopamine) show increased activity. These same regions activate when people anticipate positive sights, smells or tastes, and their activity correlates with feeling both good and aroused (e.g. "excited"). Second, when people anticipate financial risk (in the form of expected volatility), distinct but also ancient brain regions nearer to the skull (i.e. the anterior insula) show increased activity. These same regions activate when people anticipate negative sights, smells, tastes or touch, and their activity appears to correlate with feeling both negative and aroused (e.g. "anxious").

### Influences on risk preferences

Activity in these deep brain regions also foreshadows upcoming choice. When people play an investment game, increased nucleus accumbens activation predicts greater risk seeking, while increased anterior insula activation predicts greater risk aversion. Further, incidental influences on activity in these regions may temporarily alter risk preferences. For instance, heterosexual males take more financial risks after seeing pictures of erotic couples than after seeing pictures of office supplies. Consistent with these findings, an "anticipatory affect" account posits that excitement accentuates the upside of risks, increasing their attractiveness. Conversely, anxiety accentuates the downside of risks, decreasing their appeal.

To some extent, the findings from this area of investigation, known as neurofinance, vindicate popular financial models by highlighting neural circuits that respond to return and risk. But they may also extend beyond traditional models. For instance, statistical properties like skew (i.e. large but unlikely outcomes) are not commonly considered, but may nonetheless influence choice. These findings might help explain the surprising attractiveness of gambles like the lottery.

Neurofinance is still a young field, but it has already produced coherent results with potential relevance to individual investors. Current findings, though, have generated more questions than answers. For instance, to what extent does neural activity related to emotion determine financial choice in the real world? At what point does rational reflection prevail? Most importantly, do these individual findings scale to the group level, and if so, when? Perhaps by shining a light on individual behavior, we can eventually better understand movements of the market. ■

**For further reading:**

Brian Knutson and Peter Bossaerts,
**"Neural Antecedents of Financial Decisions," Journal of Neuroscience,**
vol. 27, pp. 8174–8177, 2007.

derperform. Similarly, investors may choose real estate, thinking that housing prices can never go down. These incorrect (yet strong!) beliefs in their ability to do better than others cause people to create undiversified, high-turnover portfolios.

Research that I and my colleagues have conducted at Northwestern and at Stanford University has shown that when news arrives that is at odds with the investment choices people made in the past, they frequently ignore it. Instead, they focus on information that confirms their past decisions. Admitting that they have made a mistake is painful to investors. As a result, they are reluctant to realize capital losses: they hold on to losing stocks and sell winning stocks, even though this strategy is less likely to maximize value.

At other times, investors are unreasonably scared. After seeing the stock market drop, they sell their equities and shun risky assets for a while. Fear may become so widespread that people lose all trust in market participants. When that happens, herd behavior takes over, increasing the risk of bank runs and causing liquidity to dry up. Such an instance occurred during the financial crisis in the fall of 2008. To restore trust in the marketplace, the US government had to intervene and create liquidity in the banking system by buying off "toxic" mortgage-related securities. People take recent negative events as an indication of what the future will bring; under these circumstances, bad news becomes a self-fulfilling prophecy.

### Factoring in emotions

Why do people fail to think about investments in the cool and calculated way that economists like to assume? The answer is simple: financial decisions are influenced by emotions. Ordinary humans do not implement formulas to maximize portfolio Sharpe ratios (i.e. the expected excess return for a portfolio divided by its standard deviation), as posited by finance theory. On any given day, a person may feel optimistic, excited and willing to take on a substantial amount of risk. A day later, for reasons that may have nothing to do with finances, he or she may lose all confidence and risk appetite. In fact, recent work in neurofinance (see the adjacent column by Brian Knutson) has shown that brain areas responsible for generating emotional reactions are very much involved when people contemplate risk and reward and in their financial decision-making. This work suggests that, ultimately, our investment choices may be driven by objective information in the marketplace, but they are also influenced by how we feel about that information. ■

**For further reading:**

Brad Barber and Terrance Odean,
**"Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors," Journal of Finance, vol. 55, pp. 773–806, 2000.**

Terrance Odean and Brad Barber,
**"Boys Will Be Boys: Gender, Overconfidence and Common Stock Investment," Quarterly Journal of Economics, vol. 116, pp. 261–292, 2001.**

Camelia M. Kuhnen,
**"Your Brain and Your Finances: Insights from Neuroeconomics," European Financial Review, December 18, 2010. www.europeanfinancialreview.com/?p=2261**

# All about people

A major achievement of economics over the last 30 years has been to show that investors are not the perfectly rational decision-makers that traditional finance models long assumed them to be. Today, says Amlan Roy, demographics is helping to flesh out the profile of the real individuals that make up the market, with far-reaching implications.

**Giselle Weiss**, freelance writer

Dr. Amlan Roy, **Managing Director and Head of Global Demographics and Pensions Research, Credit Suisse, London. He is also a Senior Research Associate of the London School of Economics Financial Markets Group.**

Giselle Weiss: What does demographics have to do with behavioral finance?

Dr. Amlan Roy: Demographics looks at populations in detail, which makes it a critical component of behavioral finance. However, traditional methods of looking at demographics have largely focused on counting numbers of people and checking off things like gender and nationality. The demographics that really matter have been ignored. I often quote Peter Drucker, who once said in an interview with "Fortune" magazine, "Demographics is the single most important factor that nobody pays attention to, and when they do pay attention, they miss the point."

What is the point?

Dr. Amlan Roy: Demographics is not just about counting. It is about all the characteristics that make up a person: where they grew up, where they studied, how their mind works and how they interact with the world. The failure of conventional finance to take these factors into account was highlighted in a book published in 2009 by the economists George A. Akerlof and Robert J. Shiller called "Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism." In the past, people were modeled as though they were identical computers making millions of decisions a minute. Behavioral finance and demographics are very intimately connected.

Let's take young people. How are they different?

Dr. Amlan Roy: The future vision of workers who were born, let's say, a decade ago, like my daughter, is going to be very different. They use iPods, iMacs, Facebook, Twitter and Google, so multitasking at a very fast pace is second nature to them. They are incredibly well connected in a technological sense. Their access to information is far better than that of my generation.

How will that affect their financial decision-making?

Dr. Amlan Roy: They are likely not to feel much need for face-to-face contact in making decisions. Their access to information and their connectivity means that they will be able to pick up and learn subjects on their own, which is quite a departure from those of us who relied on formal education to acquire knowledge. People who have information, and can use it well, will be far richer than people who don't, because information is what enables arbitrage, market control and speculation. The young of

Photo: Thomas Eugster

tomorrow will probably also trade more frequently. In ten years' time, the algorithmic trading that is now pretty much done only in big banks may be characteristic of day trading as well, and done by many, many more people. Young people will take risks because the markets are there to let them, whether it be in China or Vietnam or Brazil. The key is whether they can take "better" risks, which comes back to behavioral finance.

What about young women?

Dr. Amlan Roy: Young women are the most important part of the population today, and they are very different from previous generations in terms of their decision-making skills: they are more confident, and feel less pressured to get married right away and settle down. Even in the most conservative families in India, where I come from, women increasingly want to put their education to good use. These societal changes are important not just from the perspective of women's investing behavior, but also for the attitude of the finance industry toward women. And not just young women. The Centre for Economics and Business Research in the UK has predicted that, thanks in part to high divorce payouts and longer lives, by 2020, the number of female millionaires in Britain will surpass that of men.

Why does behavioral finance matter?

Dr. Amlan Roy: In 1995, Robert Lucas won the Nobel Prize in economics essentially for work he did in the 1970s pointing out that consumers and investors are not the fools economists and econometric models make them out to be. Lucas and other Nobel laureates like Maurice Allais and Herbert Simon also tried to understand the behavior of consumers by revisiting the assumption of perfect rationality, considering workers and governments as part of an interrelated system, and asking why it was that large-scale models with hundreds of equations could not explain macrorealities such as recessions and so forth. Modeling human beings and individuals as perfectly rational decision-makers is a heroic overstatement! It reflects a gross misunderstanding of human behavior and decision-making.

What was the upshot?

Dr. Amlan Roy: For some time now, even the most complicated derivative pricing models have been taking risk and consumer preferences into account. In other words, we assume that, at the heart of economics, there are agents or consumers making decisions based, for instance, on preferences and on market and budget constraints. Behavioral economics takes those considerations even further by including consumer psychology. People are at the core of these things. It is time to look more realistically at the way they behave.

You are a fan of the book "Microtrends."

Dr. Amlan Roy: It was written by the chief strategist for Hillary Clinton's 2008 campaign. The subtitle is, "Surprising Tales of the Way We Live Today." When I show it to investors, I tell them two things: if you understand the way people live, you start understanding the way they work, play and spend. And once you know something about that, you begin to understand the world of investments and stocks much better.

A study carried out by the Boston Consulting Group makes the point that women all over the world are dissatisfied with the financial services industry.

Dr. Amlan Roy: A young colleague of mine who is a finance specialist says that it is still the case that she can walk into a major bank and have an investment advisor talk down to her as if she could not possibly understand the financial products he is selling. If, a half hour later, she sends in one of her male students, he is treated entirely differently. Her own feeling is that the industry needs more women who understand the psychology of what matters to women in making decisions.

You make a connection between pensions and behavioral finance that may not be obvious to everyone.

Dr. Amlan Roy: This area represents another example of the wrong application of economic models to understanding behavior. In the past, we tried to apply standard models of optimization – Sharpe, Markowitz, what have you – to all investors and clients on the assumption that the only thing that matters is the return and standard deviation (i.e. how much an individual measurement varies from the average). Yet in decision-making, many other things matter too. Increasingly, we appear to be moving away from a world in which companies provide pensions for their employees, and toward one in which individuals decide what investments and asset classes they are going to hold. But investors are very different as people are very different. In the real world, investor behavior departs from the way that we model it in finance and economics.

Which is to say …?

Dr. Amlan Roy: That pension asset allocation, on an individual basis and by pension fund, is subject to very differing behaviors depending not just on investors' past experience but also how the information is presented. Psychology is very, very important. I don't mean that we should model each and every investor. But it makes no sense to assume an "average American," "average Briton," "average Swede" and so on.

You also place quite a lot of emphasis on health.

Dr. Amlan Roy: It's all interconnected. Understanding how important health is for an individual and society is going to be paramount as we make choices about how we want to spend our money. For many rich countries, health expenditures are currently about 6% to 10% of GDP. As people live longer, governments will not be able to cover these costs. Deciding to live healthier lives will require education and changes in behavior. For example, choosing to eat more balanced diets could enable people everywhere to remain healthier, more energetic and consequently able to work longer. Retirees, too, can continue to work part-time, or just enjoy themselves. Health is wealth. And wealth is finance. ■

**"In the past, people were modeled as though they were identical computers making millions of decisions a minute."**

## Hot off the press

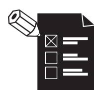
Media announcements often impact Wall Street, however the correlation between news and share prices is rarely one-to-one and it is notoriously difficult to isolate which factors linked to major events cause which players to sell their stocks. Media research in behavioral finance attempts to make sense of investors' reactions.

Photo: Mathias Hofstetter

# How media shape markets

The influence of media on people's opinions and subsequent behavior underlies the global marketing industry. But its effect on investment behavior is less well understood. Werner Wirth and Katharina Sommer explore how the ability of various media to highlight events and color them emotionally affects people's financial decision-making.

**Werner Wirth** and **Katharina Sommer,** Institute of Mass Communication and Media Research, University of Zurich



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How powerful are the media? In the political arena, they have earned the title "fourth estate" for their role in shaping public opinion, setting agendas and influencing the decision-making of political leaders. When it comes to behavioral finance, however, the function of the media would appear primarily to be that of disseminating information, such as details of company fundamentals and the recommendations of analysts. Moreover, by the time financial information reaches investors via the media, it is already out of date. By the time it is fixed in print in the morning newspaper or prerecorded for TV broadcast, big investors have already acted on this information, which they obtained from other sources. By this measure, the media's effect on investors as a means of spreading information is not especially compelling.

### In the frame

But the media do more than just disseminate financial information. Media coverage, through newspapers, magazines, TV, radio and now the Internet in all of its manifestations (webcasts, RSS feeds, Facebook, Twitter, blogs), also brings financial issues to the attention of investors, accentuating certain perspectives and information about a development and de-emphasizing others. When a negative trend in the financial markets becomes a "crisis" of "alarming" proportions, the media provide an ongoing interpretation as action unfolds. Movements of companies or fundamentals may be described in terms of losses or gains, a selective focusing known as "framing." In interpreting, framing and describing events, the media arguably affect investment decisions. But here, investors are generally not reacting to relevant financial information but to "noise," and the choices they make are accordingly based less on reason than on feelings. One aim of behavioral finance is to explore the influences that lead to "irrational" investment decisions, and media effects are an important element of this field of research.

### Beyond losses and gains

Perspectives on issues presented by news media may constitute the basis for judgments about, say, a company. A media focus on a company's losses as opposed to its gains, or vice versa, can sway the decisions investors make about whether to buy that company's stocks or bonds, or those of the industry in which that company operates. In the process, investors may ignore other information that might be relevant but that has not been picked up by the media. This human tendency to choose differently based on how a certain piece of information is presented is one of the basic principles of prospect >

Werner Wirth and Katharina Sommer of the Institute of Mass Communication and Media Research, University of Zurich, are both experts in media psychology with a particular interest in persuasion, emotion, political communication, advertising effects, and the impact of organizational and financial communication on decision-making.

theory, a cornerstone of behavioral finance that was first formulated in 1979 by psychologists Daniel Kahneman and Amos Tversky [1]. Although Kahneman and Tversky did not explicitly discuss media effects, we believe that media coverage should be taken into account in considering the influence of framing on investment decisions. Media coverage also highlights specific issues or "angles." This kind of selective attention increases the perceived importance of a given issue, which subsequently also influences investors' judgments. Imagine a media frenzy has broken out over a scandal regarding the working conditions of a brand-name company that prides itself on its wholesome image. Apart from damage to the company's reputation from the publicity, it is also likely that, from now on, investors' judgments about other companies will factor in their working conditions. As established by numerous researchers, most recently psychologist David Roskos-Ewoldsen and his colleagues[2] from Ohio State University, investors use shortcuts and rules of thumb when deciding, and they fall back on information that is easily accessible. To some extent, the media control the accessibility of information by deciding what is newsworthy. In the scandal case above, by framing the issue of working conditions, the media have "primed" it for investment decisions.

### Telling stories

Priming mechanisms are especially obvious when different media highlight the same information or perspectives on an issue. If investors are given consistent information from different media, they weight the information more heavily, a phenomenon known in behavioral finance as the "information sources effect." Consonant coverage increases when some media, so-called media opinion leaders, act as "intermedia" agenda-setters through their interpretation of financial developments. Moreover, cumulative coverage in a single medium that people tend to go back to because they find it highly credible – the "Wall Street Journal," for example – compounds the information sources effect.

Apart from selecting information and perspectives, journalists also provide context and reduce complexity in reporting developments. Illustrating global events with examples of individual companies, for instance, helps to increase the vividness of a story and makes it more interesting. In addition, people read newspapers and watch TV for entertainment as well as for information. Consequently, dramatic or hot events are often given an emotional spin. In covering cases of fraud, such as Madoff's Ponzi scheme, journalists typically focus on investor panic or the anger of victims. Media effects studies, such as those by Joanne Cantor from the University of Wisconsin [3], have shown that simply describing emotions elicits an emotional response from an audience. But emotional reactions can also be provoked by developments that are described as frightening, annoying or pleasant. According to researchers of appraisal theory, such as Josef Nerb [4] from the University of Freiburg, specific angles on an event can generate different emotions.

### Setting the tone

When the media describe consequences of events as negative for investors, but these consequences are uncertain, the response to the news may be fear. When negative consequences have already occurred and someone is clearly to blame, it is reasonable to assume that the public will respond with anger. Behavioral finance is itself a young discipline, and research is only just beginning to investigate the effects of emotions in media coverage on investment decisions. "Sentiment analysis," for instance, focuses on the tone of media coverage by distinguishing between positive and negative coverage of

Photo: Thomas Eugster

financial issues. But this kind of differentiation of media stories does not take into account the fact that different emotions that are both negative, like anger and fear, can trigger completely different reactions. Investors who are fearful sell shares in panic, whereas anger does not lead to this behavior. Sentiment analyses are further limited by the types of instruments used to analyze the tone of media coverage. Paul Tetlock of Columbia Business School, for example, showed in 2007[5] that using computer programs to analyze the news on the basis of word counts for positive or negative sentiments fails to take context into account. Consequently, double negatives, irony and metaphors are ignored, which biases the analysis. Media trend algorithms thus carry the risk of neglecting context.

### Anticipating reactions

All these approaches suggest that financial news has a direct effect on investors. But the media can also have an indirect effect on financial decisions. Experienced investors, in particular, may not think that they are directly influenced by media coverage. Nevertheless, they are constantly exposed to financial news. In his 2005 study on the influence of media coverage on the trading patterns of professional investors, Aeron Davis from the University of London[6] showed that investors react to media news because they think it will affect other market participants. Earlier, in 1990, David Scharfstein and Jeremy Stein,[7] both of Harvard University, reported that this mimicking of the expected reactions of other investors can cause herd behavior. People believe that they are significantly less influenced by media than others are, a phenomenon known in communication sciences as the "third-person effect." Applied to investment decisions, it suggests that investors may be influenced by negative coverage about the fear of price drops, not because they are emotionally moved themselves, but because they believe other investors may be induced to act in a certain way. Curiously enough, we call this phenomenon the "influence of presumed media influence."

Research into the effects of media content on financial decisions is especially relevant in view of the tendency of investors to act irrationally. Accordingly, we are witnessing increasing interest in including media coverage in studies on financial decisions. A joint research project between the Institute of Mass Communication and Media Research and the Swiss Banking Institute at the University of Zurich is currently investigating how media news affects investor behavior and stock prices. The project aims to analyze the content of financial news for emotional elements and link the findings to market movements. Combining the expertise of communication sciences and finance would appear to auger well for obtaining deeper insights into the complex interaction of media effects and financial behavior. ■

[1] Kahneman, D., & Tversky, A. (1979), "An analysis of decision under risk," Econometrica, 47(2), pp. 263–291.
[2] Roskos-Ewoldsen, D. R., Roskos-Ewoldsen, B., & Dillman Carpentier, F. (2009), "Media priming: An updated synthesis" in J. Bryant & M. B. Oliver (Eds.), "Media effects: Advances in theory and research" (3rd ed., pp. 74–93).
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[6] Davis, A. (2005), "Media Effects and the Active Elite Audience: A Study of Communications in the London Stock Exchange," European Journal of Communication, 20(3), pp. 303–326.
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## Throwing caution to the wind

A growing body of evidence suggests that men often think they know what they are doing when, in fact, they do not. This overconfidence leads them to trade more frequently than women – and often at the wrong times.

# Mad men and sensible women

## When it comes to investing and risk-taking, studies suggest men are typically overconfident and women typically cautious. As social trends change, this fact could have important consequences for financial services.

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If behavioral finance is the attempt to explain why "rational people make apparently irrational investment decisions," one area that captures our attention is gender-based investing. According to various studies, men often appear to be "irrational" while women can be overly "rational." This may seem like a stereotype, but a problem with this particular field of behavioral finance is that it is not as well-researched as other areas. Hard evidence on gender-related investment choices is difficult to gather. Household surveys generally record the assets of households rather than individuals, and "rich lists" tend to report family wealth under the name of the husband.

However, most available evidence of gender difference shows that men take more risks than women, trade more (according to Barber/Odean[1], men trade 45% more than women, with single men even trading 67% more than single women), and thus apparently lose more. As the US Survey of Consumer Finances[2] suggests, in general women hold less risky assets than men in retirement and pension portfolios. Within the household, married women also tend to hold a lower percentage of their retirement assets in stocks and take fewer risks than men. Furthermore, married men tend to take fewer risks than single men (Arano et al., 2010[3]). Similarly, as the 2010 Credit Suisse Global Wealth Report notes, wealth and gender are under-researched, but what evidence does exist indicates that in countries like the USA and the UK, women tend to be more risk-averse overall. In the UK, women tend to allocate their assets to cash and property rather than equity. In cases where they hold more stocks than men, men tend to have greater private business investments that reflect a higher risk appetite.

**"Based on the evidence, one wonders whether behavioral changes leading women to be less risk-averse and men to be less risk-seeking might improve their investment decisions."**
Christine Schmid

### Can changing behavior make people better off?

Based on the evidence, one wonders whether behavioral changes leading women to be less risk-averse and men to be less risk-seeking might improve their investment decisions. Or are there plausible reasons for the trends we observe that help explain what some people may regard as superficial stereotypes? If anything, women should invest in riskier assets than men as they have longer average life spans and longer retirements than their male counterparts. Or perhaps not. Some literature (e.g. Bajtelsmit & Bernasek, 1996[4]) suggests that it is the wealth gap between women and men that explains lower risk-taking. In other words, women take less risk because they are, on average, less wealthy. The expected gender wealth shift may gradually begin to close this gap. Or perhaps it is those advising women investors who are at fault? Advisors may pigeonhole women as being more conservative and, consequently, offer them less risky investment options from the outset. There is, however, evidence that women are more risk averse than men even when offered a large assortment of retirement plans.

From a behavioral point of view, it may be that women are not risk-averse, but men are simply too "risk-hungry." The literature suggests they fall prey to a behavioral trait known as "overconfidence," which often leads to more aggressive and active trading (Deaves et al. 2009[5]).

### Does it matter?

The notion that men appear to have a higher risk appetite and women are overly risk-averse is increasingly important for the financial services industry in light of the rising wealth and economic freedom of women globally. Demographic trends in the developed world point to a growing number of wealthy female clients in the coming decade. This trend will also be increasingly manifest in the growth of female entrepreneurship. While the overall number of women in the Forbes 400 is falling, the number with "new wealth" is rising, as is the number of female executives. Moreover, in terms of practical investments, more and more companies are now offering their employees pension plans that require active decision-making, and more females are likely to take out private pension plans and build investment portfolios in the future.

That women appear to take fewer investment risks than men is potentially problematic given that, first, they may have lower incomes than men and, second, lower risk-taking could translate into suboptimal portfolio allocations and potentially lower investment returns >

Photo: Ian Coble, Getty Images

## Too circumspect?

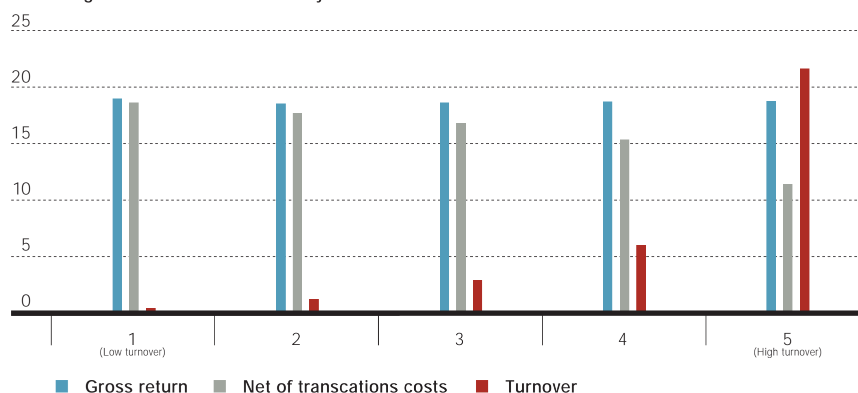
On average, women are more risk averse, trade less and are more likely to admit when they don't know something than men. This can play in their favor if buying and holding is the best course of action; but it can also work against them: the more risk averse investors are, the lower their expected returns.

over their life span. This is important because women still tend to retire before men and have a longer life expectancy. One solution here is to address financial literacy, focusing on investment and finance education generally and women's issues specifically. The finance industry also needs to offer women transparent investment options that leave them in no doubt about the rates of expected return on portfolios and pension plans.

Clients of financial institutions should be offered services and guidance commensurate with their needs and, where appropriate, this should take account of gender. The industry should also address a common complaint in the gender economics literature: excessive reliance on jargon, which can be off-putting to a large proportion of the (female) client base. If these strategies prove commercially attractive – and if the behavioral studies are to be believed – we should see a growing number of women investors over time. This would be a welcome development. Imagine a marketplace with less overconfidence, more fundamentally driven decisions, and lower volatility and debt! Wealthy women may also be better positioned to exploit the powerful combination of wealth and social networks to optimize returns and influence (Jehanne Wake, August 2010[6]). Major channels for improving financial literacy among women and raising their profile include academic circles, business clubs, society and charity events as well as board memberships. Many European countries are debating introducing quotas for women on management boards; indeed some aready have laws in place. Such changes would amplify female influence and female-controlled wealth.

## 01_Overtrading can be hazardous to your wealth

Overconfidence can result in higher trading frequency and poorer performance, as illustrated by the individual investor quintiles below. Source: see Footnote 1




### Can "mad men" learn?

If this is too much to hope for, we may seek solace in using behavioral finance to show high-risk-taking men the errors of their ways. Loss aversion, overconfidence and herding are just three behaviors that, if the literature is correct, deserve "mad men's" full attention. Below, we briefly highlight a number of behavioral strategies for avoiding these pitfalls.

First, loss aversion – the observation (which won Daniel Kahneman a Nobel Prize) that people naturally prefer avoiding losses to acquiring gains. We remind high-risk-taking investors that good risk managers live by the maxim "he who takes the first loss shall take the smallest loss"; binding stop losses are just as important as calling the winners. Second, overconfidence, which causes people to overestimate their knowledge and ability to master events as well as underestimate risk. Investors should take care not to overtrade and be aware that the market has a habit of turning against people just at the moment when they think they can beat it. And third, herding. This involves individuals acting together in an unplanned or uncoordinated way and often produces strong price momentum as winning investments attract more adherents, while losing investments are left. Our remedy: read Charles Mackay's "Extraordinary Popular Delusions and the Madness of Crowds," which is as relevant today as it was when it was first published in 1841.

### Conclusion

The relatively sparse evidence that exists suggests that women take a more conservative view of investing than men, who at times appear to invest too aggressively. Growing secular trends, like rising wealth and economic freedom, in addition to improving financial literacy among women, make this fact increasingly relevant from an investment perspective. Insights derived from behavioral finance can be deployed here to help curb men's propensity to take too many risks and make investment strategies more transparent so that women are more trusting of them. –

[1] Brad M. Barber, Terrance Odean, "Boys Will be Boys: Gender, Overconfidence, and Common Stock Investment"
[2] "Survey of Consumer Finances," Federal Reserve Board, 17 Feb 2009
[3] Arano, K. Parker, C. & Terry, R., "Gender-based risk aversion and retirement asset allocation," Economic Inquiry, vol. 48, No. 1, January 2010
[4] Bajtelsmit, V. & Bernasek, A., "Why do women invest differently than men?" Financial Counselling and Planning, volume 7, 1996
[5] Deaves, R., Luders, E. & Luo, G., "An experimental test of the impact of overconfidence and gender on trading activity," Review of Finance (2009), 13: pp. 555–575
[6] Jehanne Wake, "Sisters of Fortune: The First American Heiresses to Take Europe by Storm," Chatto & Windus, August 2010

# Learnings from gender focus in microfinance

## Some microfinance institutions adopt a conscious gender bias. How successful is this approach in terms of repayment, cost and profitability? And how are strategies changing?

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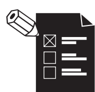

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Early microfinance donor programs were directed almost exclusively at women on the assumption that, on average, credit provided to women would have better "multiplier" effects than credit provided to men, for example by improving the welfare of the whole family. With microfinance lending now broadly available to both men and women, the past few decades have shown that women do, indeed, have a better loan repayment record than men. This suggests that women generally invest in less risky businesses and have greater incentives for loan repayment because they are keen to maintain access to credit, village groups, networks and other facilities provided by microfinance institutions (MFIs)[1]. Studies[2] have also shown that microfinance services positively influence women's decision-making power and enhance their overall socioeconomic status.

**"Targeting women has ... also contributed positively to the financial sustainability of institutions providing microfinance services."**
Marion C. Struber

The MFI universe now encompasses a broad range of "business" models, from not-for-profit to for-profit organizations, and it is thus an interesting testing ground for gender-based behavior. The different degree to which MFIs focus on gender today (e.g. with regard to penetration rates, loan portfolio quality, and profitability) underscores some of the key considerations in play when devising sustainable growth and development strategies for some of the world's poorest people. Of the 83 countries and 550 MFIs for which detailed data are available through a microfinance data provider[3], India, Bangladesh and Nepal have a substantial bias towards MFIs with a major focus on women (75% or more women customers). In Latin America, Mexico has a high percentage of women-focused MFIs, while those in other countries in the region tend to have a more even split between men and women. Both Asia and Latin America have mature microfinance markets, but ideological, political and economic developments in both regions have resulted in quite different gender-related lending practices. In Bangladesh, for instance, the first MFI – an experimental research project – began by providing small loans to the rural poor; in Bolivia, on the other hand, MFIs started by offering loans to cash-strapped casual laborers and victims of high urban unemployment. This intervention was geared primarily to urban rather than rural groups, and was concerned less with reducing poverty and more with encouraging microenterprises[4]. Target client groups can therefore vary widely.

### Penetration rate and loan portfolio quality

The penetration rate considers both breadth (number of clients) and depth (relative poverty of clients). The average size of loans and deposits is often taken as a simple proxy for the penetration rate. MFIs with a major focus on women display the highest number of borrowers. When comparing the customer base of MFIs focused 75% or more on women with MFIs focused less than 25%, the difference in the penetration rate is 77%. This is an important indicator of the poor's access to loan products. The corollary of this broader accessibility is, however, that women microfinance customers borrow smaller amounts. Across all regions, the median loan size per borrower is USD 161 for MFIs with 75% or more women customers versus a median of USD 377 across all MFIs.

As regards the quality of the loan portfolio, the high female repayment rate has been one of the main arguments for targeting microfinance services at women. Looking at the repayment structure across MFIs by portfolio-at-risk for more than 30 days (PAR > 30), write-off ratios, and provisions for loan impairments (provisions), women-focused MFIs tend to perform best (see Figure 1). PAR > 30 days is the most widely accepted measure of portfolio quality and represents the principal amount of all loans outstanding where payments are more than 30 days overdue. Write-offs or impairments are loans that the MFI has removed from its gross loan book because they are unlikely to be repaid. Women often borrow via group-lending systems which have superior repayment records, as group members are generally highly motivated to comply with repayment terms in order to retain access to lending in the future.

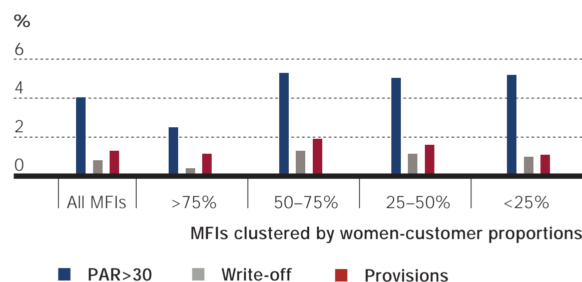
### Operating costs and profitability

Focusing on women is generally assumed to be more costly for MFIs, because women tend to borrow smaller amounts and are less mobile and educated than men in many developing and emerging countries. The small-

**"Study after study has taught us that there is no tool for development more effective than the empowerment of women. No other policy is as likely to raise economic productivity, or to reduce infant and maternal mortality. No other policy is as sure to improve nutrition and to promote health. No other policy is as powerful in increasing the chances of education for the next generation."**
Kofi Annan, 7th Secretary-General of the United Nations, 2005[5]

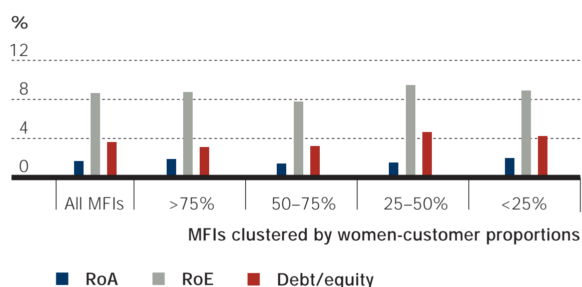
## 01_Measures of portfolio quality, 2009

On average, women-focused MFIs demonstrate superior repayment profiles. Source: Credit Suisse




## 02_Profitability indications, 2009

MFIs with 75% + female clients achieve slightly above median RoA and RoE with below average leverage. Source: Credit Suisse




er average loan sizes are due primarily to group-lending practices and more conservative investment strategies. However, the fact that women are usually members of a lending group tends to reduce costs for the MFI compared to individual lending because repayment monitoring is outsourced to the group.

Based on our data sample of 550 MFIs, the cost per borrower is in fact much lower for women-focused MFIs than across the full range of MFIs, with a median of USD 37 for MFIs with 75% or more women customers versus a median of USD 97 for MFIs as a whole. However, overall operating expenses as a proportion of the loan portfolio are highest in women-focused MFIs due to the larger customer base, with a median of 21% versus a median of 18% across all MFIs. This outcome supports the observation that MFIs with a significant focus on women tend to have higher operating expenses due to a broader penetration rate for a smaller-sized borrower population, rather than higher costs per borrower.

In order to obtain a more complete picture of the financial performance of MFIs targeting women, it is useful to analyze it in terms of return on assets (RoA), return on equity (RoE) and capital structure (debt/equity). As shown in Figure 2, the median RoA and RoE for MFIs with 75% or more women customers is above the median across all MFIs, and leverage, represented by the debt/equity ratio, is lowest. MFIs with 50% or less women customers show the highest profitability, but at the expense of higher leverage. There is no evidence to suggest women-focused MFIs are less profitable, despite the fact that they generally exhibit higher total operating costs. In fact, RoA and RoE are equal or higher and leverage is lower, which may be taken as an indication of a more sustainable penetration rate.

### Conclusion

If women are excluded from traditional financial institutions, MFIs are often the only financial-services channel available to them. But, with the increasing provision of microfinance services to a broad population of poor people around the world, the original focus of microfinance on women has changed. Ongoing commercialization has led MFIs to deploy a variety of business models and expand their product offering and client base in their quest for higher growth rates.

However, the overall results, based on 2009 data from 550 MFIs around the world, suggest that focusing on women in the microfinance sector has remained highly attractive from a financial and social point of view. One of the main social objectives of providing microfinance services to the poor is to have a positive impact on their family lives, with increased household income resulting in better health, nutrition and education. It is estimated that women make up 70% of the world's poorest population. By ensuring a generally wider penetration rate, MFIs with a major focus on women successfully contribute to achieving these objectives. Generally smaller loan sizes, in turn, lay the foundation for better-than-average repayment profiles and thus better loan portfolio quality. While operating costs tend to rise with a higher number of customers, costs per borrower are not higher at MFIs with a strong focus on women nor is profitability lower. Targeting women has therefore also contributed positively to the financial sustainability of institutions providing microfinance services and to the microfinance-supported development model overall. Indeed, eight of the ten largest MFIs by number of borrowers are principally focused on women. –

[1] Hirut Bekele Haile (2010): "Targeting married women in microfinance programmes," 9f
[2] S. Cheston / L. Kuhn (2002), "Empowering Women through Microfinance"
[3] MIX Market, http://www.mixmarket.org
[4] H. Montgomery / J. Wiess: "Great Expectations: Microfinance and Poverty Reduction in Asia and Latin America," Oxford Development Studies (2005)
[5] Kofi Annan, www.un.org/News/Press/docs/2005/sgsm9738.doc.htm

**Ebb and flow**

Like the weather, stock-market trends are highly complex, non-linear and dynamic. Individual transactions and decisions may be random and, up close, the trading process may appear chaotic. But chart comparisons indicate that the tide of confidence and fear is often highly correlated around the world.

# Nine theses

## What drives stock markets is a burning question for millions of investors. We are unlikely ever to find a conclusive answer. But one thing is certain: the human factor has long been underappreciated.

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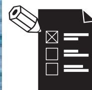

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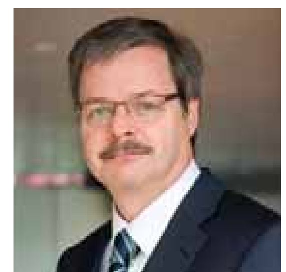
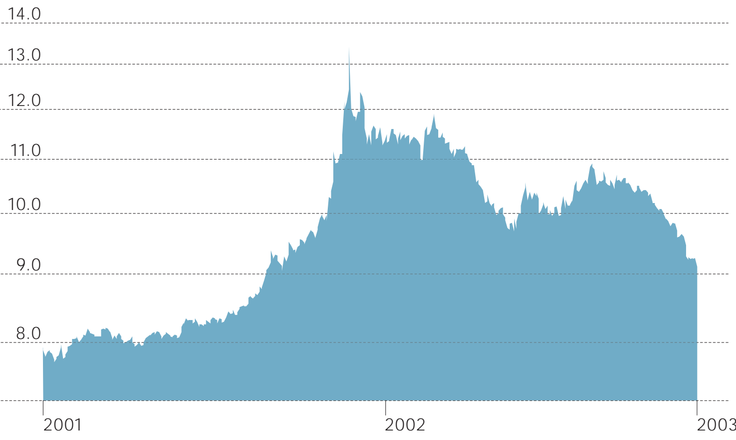
Every investor begins small. As an intern at a bank known back then as the Schweizerische Kreditanstalt (Swiss Credit Institution), I regularly read financial publications. One day I came across a report about a company called Elektrowatt that seemed to have excellent prospects. I went to the securities counter and told the advisor that I wanted to buy Elektrowatt shares. She asked me how many, and I told her that one share would do on my intern's salary. As a proud investor, I followed the price of Elektrowatt shares every day after that. Lo and behold! The value of my share rose to 2,000 francs. Then it dropped some. At first I stayed calm. But when the price of my share fell to 1,300 francs within a month, I lost my nerve and sold it. Oddly enough (to me), Elektrowatt's profitability was still developing very well. Everything I heard about the company was positive, yet that seemed to have no bearing on the share price.

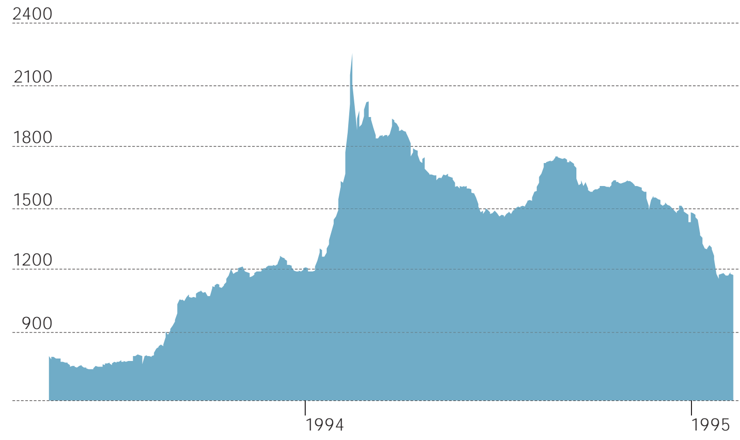
Since 1978, great strides have been made in securities analysis. Fundamental and quantitative methods have been refined and improved. At the same time, somewhere along the line, people (including myself) became aware that events in the stock market cannot entirely be attributed to "scientific" factors. This led >



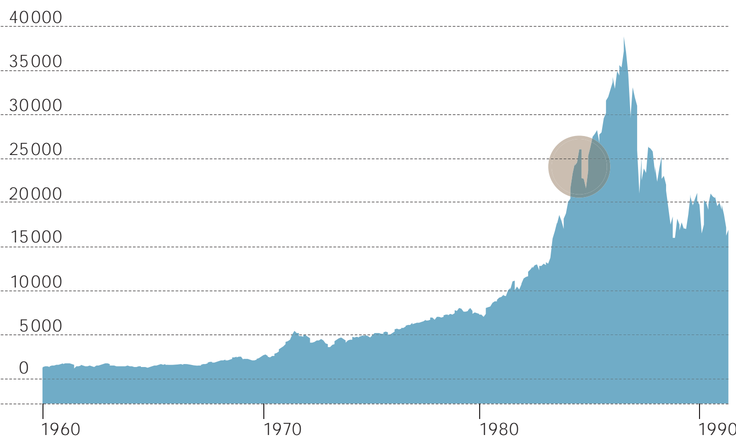
**"The mass psyche is neither a price nor an individual; it is something that has a life of its own."**
Rolf Bertschi

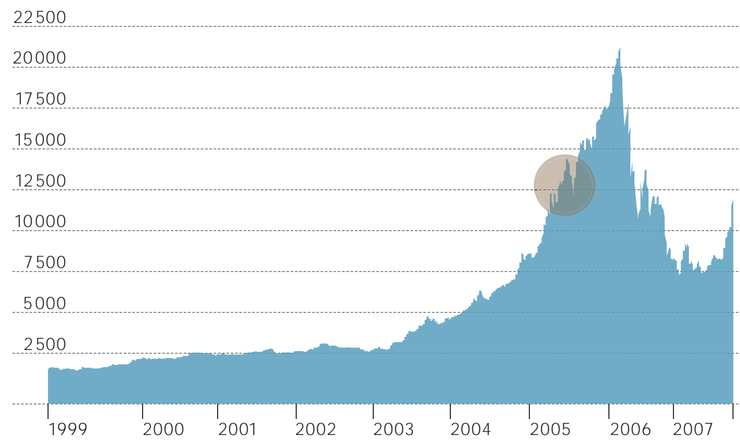
Photo: www.michaelmarten.com




The mood of the crowd displays similar patterns across asset classes. The trend in US dollar / South African rand **(Chart 1)** closely resembles that of the Bucharest Stock Market Index **(Chart 2)**.




Likewise, the development of entire stock markets tends to follow similar patterns around the globe and across time scales. The stock market bubbles in Japan **(Chart 3)** and Egypt **(Chart 4)**, for example, follow very similar trajectories.

Source: Reuters MetaStock Professional

to the rise of behavioral finance, which attempts to track the psychology of securities markets. The following nine working assumptions highlight the existence and importance of the collective mood, which investors should build into their investment decision-making process.

## I. The causality principle does not apply to the stock market

Most investors believe that the economy, or business, is central to the financial markets. Everybody will tell you that good news, such as a drop in unemployment, triggers a price increase. The daily newspapers are filled with explanations of why prices rise and fall. But this instant analysis fails to consider price changes that span more than just a few days, weeks or months. The dependency of the stock market on the economy arises from short-term observation of market reactions, which indeed appear to be triggered by fundamental news (i.e. economic data such as earnings). But, even then, the Swiss franc might rise 20 points after publication of a positive news report, and then rise 100 points on another occasion after the publication of an apparently similar report. This suggests that the causality principle, to the extent it applies at all, relates only to the direction of a market reaction and not its size. Each time prices rise on the heels of a seemingly positive news report, in the eyes of investors the causality principle is confirmed. However, in reality, prices often move in a contrary fashion, dropping in the face of positive news announcements or climbing in response to negative news.

## II. Economic cycles and exchange cycles are out of phase

Until the economy recovers from a recession, or weakens after a boom, prices and sentiment in the stock market tend to be far ahead of the new bull or bear market. Fundamentally oriented investors do not really understand why the markets rise or fall at the turning point because the market trend does not match the "phase-shifted" economic picture. Consequently, investors remain pessimistic for much of a bull market because the business fundamentals are still negative. Similarly, they remain optimistic for much of a bear market because positive news is still coming in.

## III. Prices always contain investor expectations

The efficient-market hypothesis assumes that all buyers and sellers act in a completely rational manner to the same information and that prices already reflect this information at any given time. Actually, it is hardly disputable that investor irrationality moves the stock markets and, conversely, that stock markets influence sentiment and thus the expectations of investors. This state of affairs can even lead to a situation in which investors are compelled by price changes to adapt their expectations and scenarios to the current market trend.

## IV. The stock market cannot "factor in" the future

Economics is strongly shaped by logical and linear thinking. To rationalize the view of the economy as a decisive stock market driver, many investors apparently assume that other investors expect economic growth and that the markets have anticipated it or "factored it in." Yet the assumption that market prices can actually contain future events to any meaningful extent is unrealistic. A closer analysis of the world's stock markets shows that trends and cycles run substantially in phase throughout the world. It is highly unlikely that every country with a stock market – from Taiwan to Japan, Germany, Switzerland or the USA – also has an investor minority that can both accurately forecast market developments and correctly anticipate stock market trends.

## V. Human nature drives the stock markets

Human nature, emotional as it is and inclined to vacillate between optimism and pessimism, is central to stock markets and the economy as a whole. From this perspective, financial markets are driven by a price/sentiment dynamic. Price changes create changes in sentiment, which in turn lead to price changes and so forth. According to chaos theory, which states that tiny actions can have huge effects, beneath this self-contained price/sentiment dynamic is a highly complex emotional interplay between millions of investors and the base value price. These sentiments among the masses are transferred to the economy. Sentiment drives liquidity, and together they keep the economic cycle churning.

## VI. The business-science view is not a panacea

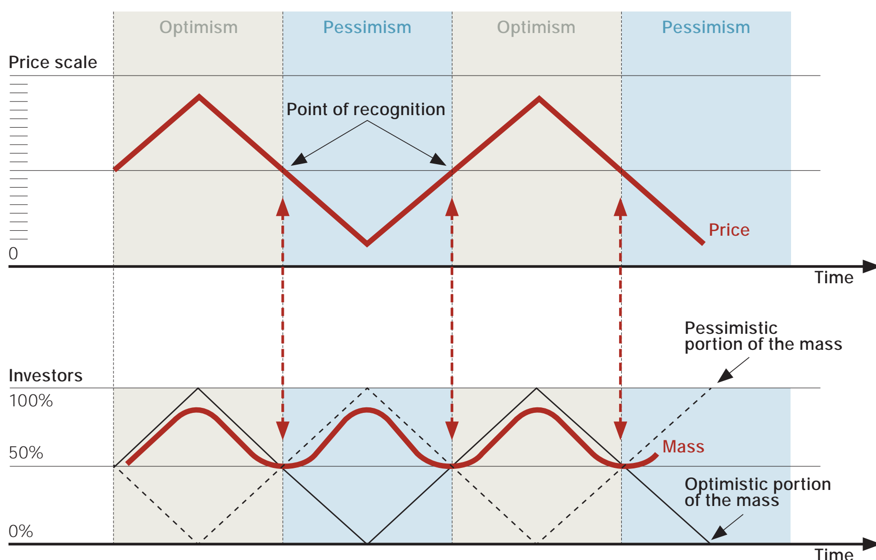
The economy – like other social systems – predominantly comprises non-linear processes and systems that are more than the sum of their parts. When such a system is broken down into its individual components, the overall picture is generally lost. The same is true of stock markets. A single price change is part of a larger whole. The whole, however, is more than just the sum of all price changes. Charting price changes on a price-and-time axis gives rise to a new system with specific characteristics and laws. This perspective enables one to see that all charts in all financial-market series across asset classes display similar characteristics. All charts, whether daily, weekly or monthly, display similar trends and patterns.

## VII. Prices mirror the sentiment of the masses

When someone buys a specific product, such as a painting, he/she pays the seller a fixed amount of money and the transaction is concluded. But in the financial markets, "representative" goods are continuously bought and sold. In other words, throughout the world, people continuously monitor price movements in market sectors, for example the price of an ounce of gold. This results in a price, say, of USD 1,301 per ounce. Collective sentiment arises through continuous interaction of many millions of people with this single price. The mass psyche is neither a price nor an individual; it is something that has a life of its own. It cannot be counted, but can be made visible through ongoing tracking of price movements. Mass sentiment is thus recognizable in a chart. What is remarkable is that stock market charts always run through the same formations. What appears to be utter chaos is actually a process that produces constantly repeating geometric patterns. Whether one is tracking and charting the course of a stock or currency or another representative financial value, charts look familiar throughout all asset classes and in various periods. **Charts 1 and 2** are not 100% identical, but they are similar. **Chart 1** shows the US dollar compared to the South African rand, while **Chart 2** shows the stock index of the Bucharest Stock Exchange. These are two financial-market series with completely different fundamental backgrounds that may be considered the cause of price changes. However, it is the mass of millions of investors and their momentum that forms the basis of the pattern. **Charts 3 and 4** are also self-similar. **Chart 3** reflects the mass euphoria of the Japanese stock market at the end of 1989. **Chart 4** shows the popular sentiment of the Egyptian stock market from 2000 to 2006. This bull market also ended in mass euphoria. The euphoric trend of the crowd displays similar patterns in the Japanese and Egyptian stock markets. In both cases, at the peak, the crowd had reached the highest-possible >

## 05_The rise and fall of confidence

Investors do not always behave in the rational, predictable and unbiased manner suggested by quantitative models, but even anomalies exhibit patterns. Source: Credit Suisse




level of euphoria, which then had no way to go but down, regardless of the state of the fundamentals.

## VIII. The mass oscillates between euphoria and panic

The tension between optimism and pessimism – the constant oscillation from one mood to another, and from one extreme to the other – also possesses certain characteristics. If, for example, the movement among the masses is toward pessimism, a price trends downward and then accelerates because individuals join the trend, forcing it until it reaches a point of maximum possible pessimism: panic. The disseminators of sentiment are the pessimists who have sold and caused the panic. Ultimately, the point of greatest pessimism is reached, and along with it, the end of the downward trend. Experience compiled from all stock markets and times shows that once this point is reached, it is sometimes followed by a pronounced rise in prices. And this occurs without there being, or even needing to be, any fundamental reason for the price rise. At the same time, most people remember the panic. They even expect a repeat of it and can give many reasons for dumping the investment that provoked the panic. Nevertheless, prices begin to rise again. Bit by bit, the pendulum swings back in the direction of optimism. However, the actual tipping point of collective sentiment was imperceptible to the individual investor, which clearly shows that the mass psyche is more than the sum of its parts. Rather, it resembles a system in its own right. The chart above shows this dynamic in a simplified manner. The steeper the price decline and the more pessimistic investors are after selling, the greater the possibility that prices will begin to rise again.

## IX. Computers can help recognize patterns

Price changes look similar, whether they occur over a matter of hours, days, weeks or months. Chart analysts described this phenomenon back in the 1920s and 1930s. For example, in his best-selling book "The ABC of Stock Speculation," Samuel Nelson described three different stock market trends[1]. Short-term movements are primarily shaped by business news and a surplus of supply and demand. They are comparable to small waves in water created by tossing a stone. The second type consists of medium-term trends, which resemble swells of waves in the ocean. The third type of trend is comparable to the ebb and flow of tides. The up and down of these long-term trends is founded in the emotional extremes of mass sentiment. For a long time, it was not possible to recognize the pattern behind these psychological tides. However, the advent of computers, exponential increases in computing power, and calculations of technical indicators have greatly simplified this task. Of course, we cannot yet calculate future stock market trends. However, we can approximate mass psychology like never before, thanks to computer-based sentiment indicators, and objective tools like trend and momentum analyses.

Behavioral finance, which we have introduced here in the form of nine working assumptions, can be summarized as the (mass) psychology of stock markets and an attempt to discover their underlying patterns. This specialized field is little known among the general public, even though the behavioral finance toolbox has become indispensable for our technical analyses. The results from our specialists flow into the decision-making process for leading investors, fund managers and investment committees. In particular, investors who constantly interact with the stock market have recognized that stock exchanges around the world obey their own laws.

Yet not only professional investors can profit from the findings of behavioral finance. It is also worthwhile for private investors to study charts when making investment decisions and to question their own emotions on an ongoing basis. A decision-making process that considers the human factor in addition to the fundamentals should result in a higher rate of success in timing the financial markets. –

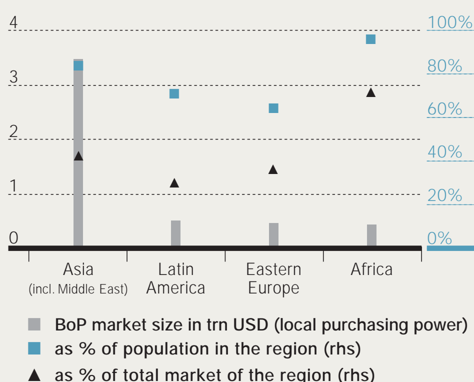
[1] S.A. Nelson, "The ABC of Stock Speculation," New York (1902)

# Reaching out with innovation

Technology has profound transformative effects. When it comes to empowering the base of the economic pyramid, it can help to catalyze its entry into a virtuous cycle of prosperity.

01_Asia accounts for the largest part of BoP markets

Source: World Resources Institute, Credit Suisse (data as of 2005)




Four billion people or 60% of the world population are underserved and largely dominated by the informal economy (not taxed or captured by GDP figures). They earn less than USD 3,000 in local purchasing parity and constitute the so-called base of the economic pyramid (BoP). While individual purchasing power appears limited, aggregate purchasing power amounts to USD 5 trillion (USD 1.3 trillion in current dollars), compared to a USD 12.5 trillion market represented by the middle-income segment (1.4 billion people with an annual income of USD 3,000 to USD 20,000), according to the World Resources Institute.

Those most in need lack access to clean water, sanitation services, electricity and health care. In addition, people at the BoP often do not have direct access to markets or financial services and depend on middlemen, which causes price inflation even for basic goods and services. Technology has a significant role to play in overcoming this poverty trap and helping the BoP enter the formal economy.

To do this, products need to fulfill several key criteria. First and foremost, they need to be affordable and take into account respective budget constraints. Many BoP consumers only have enough cash to pay for products on a per-day basis. Thus, for example, it became necessary to develop single-serve packages for products such as soaps and laundry detergents in order to ensure affordability. Second, ease of use and low maintenance requirements are key features of a successful technology, and it should be possible to repair technological installations using local resources and materials. Third, only sustainable solutions can be scaled to meet the needs of so many incremental consumers.

Broadly speaking, there are two approaches to bringing technology to the BoP. One is leapfrogging – the transfer of next-generation technologies – that greatly accelerates the development process in those countries by circumventing a costly infrastructure buildup for an older technology that is on the verge of being outdated (e.g. fixed-line telephony). This may be achieved by adapting new technologies to the realities of the BoP markets. The second approach is one known as frugal innovation or reverse innovation, where products are initially designed and developed for BoP markets that may ultimately appeal to developed markets too.

Inherent to both approaches is the critical idea of transferring at least part of the value creation to members of the local community, which in turn allows them to identify with the technology and the advantages it brings. Local merchandising schemes create jobs and eventually propel BoP societies to an entirely new level of participation in global trade and markets. If Africa were to gain an additional 1% share of global trade, it would equal an incremental USD 160 billion in exports. While not directly comparable, this amounts to roughly four times the current level of international aid. After all, the BoP is not short of assets, but mostly lacks the means to unleash some of its dormant assets. –

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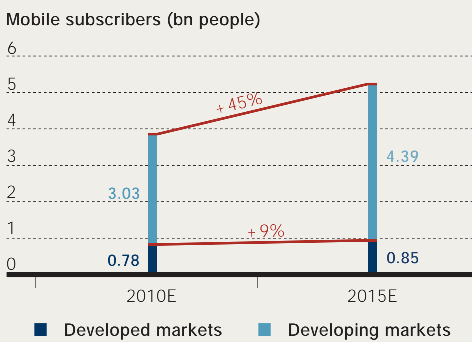
Leapfrogging

# Shortcut to frontier technologies

## 01_The next billion mobile subscribers are likely to come from developing markets

Source: Credit Suisse Investment Banking




BoP markets have the unique opportunity to leapfrog the traditional path of technological and economic development by introducing next-generation technologies directly from the start, circumventing the buildup of expensive infrastructure such as landline telephony and electrical networks. Instead, they benefit from the absence of older established legacy systems, which greatly helps to facilitate the adoption of new technologies.

Some of today's most recent technologies, such as mobile telephony and solar energy, lend themselves better to rapid deployment and sharing due to the autonomy of their functional units. They represent point-of-use infrastructure, which can easily be moved within or shared with others in the community.

Mobile telephony is arguably the most prominent example of successful leapfrogging in developing countries. The rate of adoption has been staggering, and the changes it brings to the BoP are profound and truly enabling. Farmers are now able to check market prices for their produce, allowing them to find out when and where to sell at the best price. People who formerly had no bank account can benefit from mobile banking services, enabling them to enter the formal economy. For small local businesses, this removes the dreary prospect of being condemned to stay small and inefficient, and thus unable to participate in a larger company's value chain.

In 2010, the penetration of mobile phone subscriptions in the developing world reached roughly 70% according to estimates from the International Telecommunications Union. This represents a share of global mobile subscriptions of approximately 75%, compared to 50% in 2005. Information and communication technologies make up a significant proportion of BoP budgets, once the basic needs such as food, water and housing are satisfied. The mobile phone becomes a universal tool for access to information and services. One interesting example is the company txteagle, which recognized this opportunity and distributes small jobs, such as translating a short text or collecting market information, in return for free mobile airtime. The continued diffusion of the mobile Internet presents a next leap forward to BoP societies. According to comScore, the social platform Twitter achieves its highest penetration rates in BoP markets, led by Indonesia, Brazil and Venezuela (the US ranks only 11th).

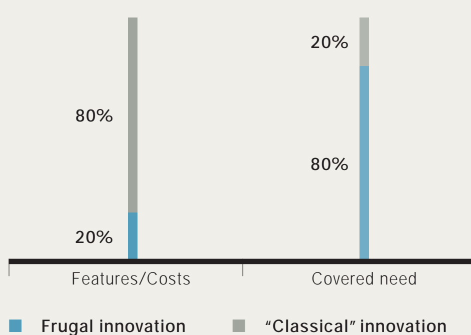
Similarly, solar energy has the potential to act as a leapfrog for access to energy in remote locations. Lighting can help to make streets more secure and allows people to work later, making them more productive. South Asia and sub-Saharan Africa are predestined to benefit from solar energy given that they enjoy some of the highest insolation on the planet. Solar energy has the additional benefit of being scalable without compromising the environment. While the trend in industrialized regions is to increasingly promote decentralized energy supply, BoP markets could propel themselves into a clean energy future. –

Frugal innovation

# Designs for the base of the pyramid

## 01_The concept of frugal innovation

Source: Credit Suisse




When attempting to sell a product in BoP markets, it is generally not enough to remove features or scale down a Western market product. Usually, locally involved research and development efforts are required to fully understand and serve the needs of BoP consumers. It demands a fresh look at local structures and peculiarities. This is where frugal innovation ties in. Basically, it tries to account for the fact that BoP markets are megamarkets with microcustomers.

In Western markets, products are usually promoted through features and performance. To the eyes of a BoP consumer, however, advanced features might be much less important than affordability and operability under difficult conditions. Thus, frugal innovation postulates the application of the Pareto principle to product development: 20% of the features are good enough to meet 80% of the demand. Frugal innovations are born out of necessity and often represent elegant and simple solutions.

General Electric (GE) is an example of a multinational company that exercises frugal innovation. GE has been developing products like ultrasound and electrocardiogram devices for sale in India and China. There, portability and low cost matters most due to the fact that many people live in rural areas and clinics have smaller budgets. Meanwhile, the company also sells these products in developed markets: in addition to being cheaper, they allow for new applications in ambulances, where portability is just as critical.

Ultimately, these developments lead to what is called reverse innovation: the frugal design not only proves useful in the BoP markets that these products have originally been designed for, but also in western markets, where many customers appreciate the value-for-money they offer. There are numerous examples of reverse innovation in emerging markets. In the automotive industry, for example, Dacia's Logan has set an entirely new price point for passenger cars. It was originally developed for Eastern Europe, South America and Africa and now also sells in developed markets. Tata's Nano might follow its path.

In conclusion, BoP products demand good performance at ultralow cost – a challenging task that often requires redesign from scratch. Companies need to carefully tailor their products to the specific needs and budgets of these markets. Besides offering technological advances to the BoP and fostering the development of skills in poorer economies, the Western world will ultimately benefit too. The corporate winners are likely to be found among multinational companies with local research and development organizations, and emerging national champions that will eventually extend their reach globally. Many emerging market companies are likely to be formidable competitors to Western multinationals in the coming years. They have the advantage of not having to cannibalize their own legacy products and thus will encounter less resistance within their organizations when it comes to taking a novel approach. –

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| | |
|---|---|
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| | |
|---|---|
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GI 2.08
**Beyond Charity**

The fight against economic exclusion of the world's poorest people is no longer the preserve of government and charitable aid. Today, their work is complemented by private sector initiatives that use business methods to combat poverty – and by pure profit-driven capital flows. Lima-based ACP Group, for example, is a pioneer in promoting development via a business ethos. In this issue of Global Investor, we offer a road map through the new range of "socially responsible investments," which offer a combination of financial and social returns.

GI 3.08
**Return to a multipolar world**

Emerging markets are feeling the global slowdown as export demand has dropped sharply, capital has flown and commodity prices have corrected. These trends are all negative for commodity exporters. Nevertheless, these countries still enjoy longer-term structural growth opportunities. The world continues to move in a multipolar direction, with a more even distribution of global economic power and wealth.

GI 1.09
**Building investment strategies**

The financial crisis has created uncertainty for investors around the globe. The value of many assets has decreased in the wake of volatile markets and a global recession arising from the crisis. The turbulent phases in the cycle require an enhanced or even new set of risk management tools. Given the uncertainties associated with risk, building solid investment strategies is both a science and an art. In this edition of Global Investor, we examine the theory and practice of investment strategy in the context of the advisory process.

GI 2.09
**Global megatrends**

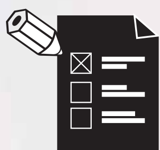
Over coming decades, the impact of megatrends on global economic growth, trade and capital flows, companies, and the stance of policymakers and regulators will be profound. We are now focusing on the massive forces of change unleashed by the rise of a multipolar world, by demographics, and by pressing issues of sustainability and human powers of inventiveness. This edition of Global Investor explores how these megatrends will play out, where the opportunities lie and which old certainties could fall by the wayside.

GI 1.10
**Inflation**

GI 2.10
**Urbanization**

Following the global financial crisis, governments and central banks took drastic steps to stabilize the financial system. But there are risks arising from the government intervention, such as the resurgence of inflation or increased fiscal imbalances in the developed economies. Thus, investors may face considerable market volatility going forward. To restore stability, governments and the financial industry will need to find cooperative and global solutions. A failure to do so could result in a prolonged period of economic – and political – disorder.

In the advanced countries, 80% of the population lives in urban centers. Worldwide the share is 50%, and by 2050 it will likely be two thirds. Cities of all kinds will remain the key locus of wealth creation. Where wealth is on the rise, the demand for diverse consumer services steadily increases. The drivers of successful urbanization – from high-quality transport infrastructure and modern telecommunications to the provision of innovative cultural services – may offer exciting opportunities for astute investors.



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