



Behavioral traps and innovation

What innovators can learn from investors' failures

There's a well-documented disconnect between the decisions that people make about money and the assumptions that classical economists made about these choices. Generally, individuals are not rational creatures when making choices about how to invest their money. But less-than-ideal decisions are not the sole province of investors. The biases and emotions that cloud our judgment about money and stymie well-intended investment plans are the same forces that compromise the ways companies invest in innovation and organize innovation processes. As innovation climbs corporate agendas, the understanding of how it works and how it can be managed is struggling to keep pace.

There are two main factors that make meaningful investment in innovation harder to manage than other corporate activities. First, innovation is fraught with uncertainties. It deals with the future, requiring assumptions about future market needs, market trends, dominating technologies, and many other factors. The outcomes of innovation projects are, therefore, highly uncertain. Research suggests that 40 to 90 percent of new product developments eventually fail.¹

Second, there is a tension between the short term and the long term. Innovation may be crucial for a company's long-term wellbeing, but it requires investment in capacities and resources without immediate cash flows. This makes innovation activities vulnerable to short-term pressures to allocate capital to more pressing matters, making rational decisions hard to come by. Faced with high levels of uncertainty and tangible near-term needs, most companies forego a promising investment in growth for the more present concerns of value preservation and cost savings.

Investors, of course, face the same challenges. Investing money involves decisions about how much to save; it involves estimates about a company's future cash flows as well as the future performance of whole economies; and it involves choices between asset classes and between thousands of securities. Furthermore, these choices require investors to define their appetite for risk beforehand.

According to neo-classical economists, there is no reason to worry. Rational humans are up to the task because in the world of economic models, individuals are assigned complete foresight and unlimited capacity for processing information. A relatively new academic branch, however, sees plenty of reasons to worry. Behavioral scientists in economics and finance combine economic theory with psychology to explore how people actually make their decisions and how they deviate from the rational decision-making processes found in the textbooks. Behavioral finance specifically looks at investment decisions and how investors process information, and has illuminated all sorts of psychological biases that prevent people from making optimal investment decisions that are consistent with capital market theory. In practical terms, this means that people lose money by following their instincts.

For these three shared characteristics—future orientation, uncertainty, and tensions between the long-term and the short-term decisions about how to pursue innovation and decisions about investing have similar structures and take place in comparable contexts. Therefore, the systematic biases pertaining to investment that are identified by the field of behavioral finance—and the solutions that have been developed—can help inform decisions about innovation. The analogy between innovation and investments enables the transfer of behavioral insights to decisions

Four behavioral traps can impair investment decisions and have particular relevance for innovation decisions: underinvestment, choosing by not choosing, focusing on the trees and ignoring the forest, and sticking with the familiar

about management, thereby opening a new perspective on innovation. This lens brings new and underappreciated questions and potential solutions to the fore.

Behavioral finance has explored and documented dozens of cognitive biases and deviations from rational decision making. For the present discussion, four behavioral traps can impair investment decisions and have particular relevance for innovation decisions: underinvestment, choosing by not choosing, focusing on the trees and ignoring the forest, and sticking with the familiar. This article will describe the investment traps and their psychological underpinnings, drawing on empirical research from behavioral finance. We will then address the behavioral solutions that can be applied to innovation decisions and processes.

Trap one **Underinvesting**

Investors planning for retirement struggle with a key behavioral challenge. They have to save today and therefore consume less, while the benefit—a comfortable retirement—lingers in the future. What is difficult about this choice is that investors know, in principle, that it makes sense to save for retirement, but they face very concrete temptations to enjoy the present even if it puts their financial future at risk. Think of trips to sunny islands or the new electronic gadget you need to have. How do people deal with this tension, and how do they decide? Even individuals with the best of intentions tend to spend what they have, delaying retirement savings.

The empirical evidence is quite clear. Data on retirement savings in the United States show two things. First, only a minority of employees (slightly more than a third) joins an employer pension plan, even if joining is—thanks to employer contributions and tax advantages—a no-

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brainer from a purely financial perspective. If people actually join a pension plan, they mostly stick with the default contribution rates, which are likely to be too low to afford a comfortable standard of living in retirement.² It is not a question of awareness or knowledge. Even if people admit that their saving rate is too low, only a fraction plans to increase it. And if they do plan to increase it, only a fraction actually does.³ In short, people underinvest in their own futures, even when they know they aren't saving as much as they should. Behind that behavior is a powerful psychological tendency called loss aversion. People are much more sensitive to losses than they are to gains. This holds true even if both are of the same magnitude. People hate losses

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twice as much as they value gains, according to several studies. A reduction of current consumption is seen as a loss, so people try to avoid it. Loss aversion often results in inertia, which suggests that resting wallets tend to stay at rest, even when it's contrary to an individual's self-interest. The consequence is an effect familiar to all change managers: the status quo bias. The status quo has a built-in advantage over other courses of action. It is the reference point for judging developments, and deviations from the status quo are felt to bring losses. Maintaining the status quo is a tempting option to prevent losses.

Behavioral solution: provide mechanisms that help individuals plan for the future

The challenge of low saving rates can be counteracted by relying on automatic mechanisms that work without conscious intervention. An example from the field of retirement savings is a program called Save More Tomorrow, established by behavioral economists Richard Thaler and Shlomo Benartzi.⁴ Employees pre-commit to higher future contributions once they receive a pay rise. In this way, their current take-home income is not reduced, and the higher contributions in the future go largely unnoticed because the contributions grow at a

slower rate than their income. The power of this program comes from the fact that employees need to make the decision to save only once, and they make that decision for the future, not the present. This autopilot solution takes advantage of the tendency to procrastinate and maintain a status quo. The program addresses loss aversion by allowing employees to save more for retirement without compromising their current income.

Underinvesting can be a serious problem for innovation activities, too. From an economic standpoint, there is a strong tendency to underinvest in innovation. According to the founder of modern innovation theory, Joseph Schumpeter, organizations will invest too little in innovation because they will have a hard time keeping the new knowledge secret and appropriating the returns from those investments. Add to that the uncertain nature of innovation, the natural advantage of projects with more secure cash flows, and the temptation to cut innovation budgets in favor of projects that are more pressing in the short term. Even if companies depend on innovation in the long term and acknowledge this, they still run the risk of underinvesting in it.

Companies could use these mechanisms in an analogous way if they face the danger of underinvesting in innovation. They can shield their innovation budgets and commit to a certain level of R&D spending in the future, irrespective of the current business situation. For example, companies could commit to and communicate their R&D intensity (R&D expenses relative to sales) in order to align the innovation budget with their long-term strategic growth goals. If disruptive innovation is a risk for companies, they could also set aside a separate bucket to fund radical innovation initiatives. Essentially, an innovation budget should be handled in a strategic

way, rather than having to compete with short-term projects. Recent empirical research of 1,200 companies from 39 countries suggests that companies with R&D spending significantly above the industry standard enjoy higher market capitalizations.⁵ Capital markets seem to be aware of the strategic value of R&D spending, so self-commitment might help manage expectations and strategic priorities.

Trap two

Choosing by not choosing

One of the main challenges for investors is choice overload. The range of investment options is huge, and choosing between so many options overwhelms most people. Choice overload has two main effects on financial decision making. First, people tend to lean toward a default option. Second, if there is no default option, they become indecisive. The first effect is evident in the Swedish pension system. In 2000, Sweden introduced a pension system in which citizens had to invest a percentage of their public pension contributions into mutual funds, credited to their individual retirement accounts. The program offers 650 mutual funds and one default fund, run by the government. How did people deal with this overwhelming array of choices? More than 90 percent chose by default—that is, by not choosing—and were automatically enrolled into the government's fund.⁶ In other words, they took the path of least resistance.

In other situations with no default option, choice overload results in decision paralysis. Research suggests that more choice attracts more attention, but it paralyzes decision making. That is true for buying decisions when it comes to marmalade⁷ as well as for investment options. When the number of investment

options in company pension plans increases, participation decreases.⁸ So, choice overload leads to paralysis, and if there is a default option—an option that automatically applies if no active choice is taken—it quickly becomes the most popular option, as people follow the path of least resistance.

Behavioral solution: designing appropriate default options

The design of a default option is critical for overcoming paralysis. Many studies show that the low participation rates in company pension plans can be increased by changing the default option. Normally, employees have to make an active and conscious choice to join a pension plan: they have to tick a box if they wish to join.

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What happens in the investor's mind is something called mental accounting. There is a mental account for every investment, and the success of the investment is judged against the initial price of each investment. Selling stocks that are performing well brings pleasure, and selling underperforming stocks brings mental suffering.

Therefore, the default option is not to join. If, however, enrolling is the default option and employees have to make an active choice to opt out, participation rates increase dramatically.⁹

Increasing a company's innovation prowess is distinctly more complex than changing the choice set of a one-time decision. Nevertheless, the analogy illustrates an important point: while innovation itself cannot be automated, innovation incentives and contexts can become institutionalized. This involves making innovation an integral part of workplace routines, internal and external stakeholder expectations, and corporate culture. In other words, innovative behavior in a company must become the default option. In behavioral economics parlance, the reference point needs to be shifted.

Consider Red Bull, a producer of energy drinks. Founded in the mid-1980s, Red Bull had within a short timeframe become the leader in a strongly growing market that the company itself created. A big part of this rise rested on the institutionalization of permanent innovations in its marketing approach. Associating the brand with edgy sports and relying on non-traditional marketing, Red Bull created unorthodox events such as the flugtag, or "flight day," where homemade flying machines vie to stay in the air as long as possible; breakdance competitions; cliff diving events; and soapbox and air races. The latest and possibly most spectacular was the Stratos project, the world-record jump from the edge of space to the earth, which was watched by 8 million YouTube users. The default option, in the case of Red Bull's marketing, was to create novel events and experiences in a clearly defined area of focus. This raises the bar for future marketing activities, sets internal and external expectations, and establishes a clear reference point against which new projects must compete.

Trap three

Focusing on the trees and ignoring the forest

Investing is about portfolios. According to economic theory, investors should not worry about the single securities in their portfolio; their only concern should be the bottom line—that is, the risk and the performance of their overall portfolio, no matter whether some securities go up and others go down.

However, in the real world, that is not how stock investors usually handle their investments. More often than not, they look at single securities and neglect the fact that they are part of a portfolio. What happens in the investor's mind is something called mental accounting. There is a mental account for every investment, and the success of the investment is judged against the initial price of each investment. Selling



stocks that are performing well brings pleasure, and selling underperforming stocks brings mental suffering. Consequently, investors tend to realize gains too quickly and have strong psychological barriers to losses. They tend to hold on to loss-making stocks way too long, hoping they at least recover their investment. In other words, they do not consider the future earnings of their investments, compare them with other investment options, and buy and sell accordingly. Instead, they hold on to what they have.

There are several behavioral effects at work. Loss aversion, as the name implies, discriminates against realizing losses. A second and related culprit is the endowment effect. People value things more once they own them. It doesn't matter whether they own stocks, coffee mugs, or projects. Owning something means

wanting to keep it. A third effect has to do with reference points. People make their decisions using arbitrary reference points—in the case of stocks, the initial price. They judge developments relative to this reference point and base their decisions on an irrelevant mental benchmark. Taken together, these tendencies combine in a powerful way and discriminate against holistic thinking.

Behavioral solution: shift toward a portfolio view

An effective way to get around this investment trap is to make a conscious and disciplined effort to shift the perspective away from mental accounting. For an investor, that might involve the need to zoom out and look at a portfolio from 10,000 feet. In other words, avoid caring about individual securities, and look at the portfolio as a whole.

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This implies that risk measures and return expectations should be set at the portfolio level, and the most basic investment decision about asset allocation needs to follow from this. After all, research shows that about 90 percent of investment fund performance over time hinges on high-level decisions about asset allocation.¹⁰ Many institutional investors set their return goals before they determine their asset allocation and consider whether they can bear the resulting risks.

Mental accounting in investments corresponds to the sunk-cost fallacy in project and innovation investments. All too often, companies decide to throw good money after bad, perhaps at the expense of more promising projects, hoping the project underway can at least recover its initial investment in what Nobel laureate Daniel Kahneman calls the escalation of commitment.¹¹

Understanding innovation projects as a portfolio can curb the tendency toward escalation of commitment. First, innovation and performance metrics should be applied to an innovation portfolio as a whole, rather than governing individual projects. Given the inherent uncertainty of innovation, it is safe to expect that some projects will fail, and others will succeed. The critical goal is to ensure that the overall innovation portfolio performs well.

A second and related point is the structuring of the portfolio. Like investments, innovation projects have varying levels of risk and potential returns. They can be radical (with high risk and return potential) or incremental (with low risk and return potential) as well as several degrees in between. A conscious effort to classify innovation projects according to their risk/return profile and manage the resulting portfolio according to pre-defined goals shifts the focus away from individual projects in favor of the portfolio level.

Similar to investors constructing a portfolio between the poles of risky new technology firms and government bonds, innovation managers can construct a portfolio ranging between high risk/high return and low risk/low return and manage the portfolio and its risk budget. This emerging innovation portfolio should be aligned to a company's overall growth goals. Ambitious growth goals may require a comparatively risky innovation portfolio with higher potential payoffs.

Trap four **Sticking with the familiar**

People have a strong tendency to focus on what they know, and they tend to rely on information that is easily available or recallable. Our gut feeling tells us to favor the familiar over the unfamiliar. The unfamiliar might

carry new and unknown risks, and the familiar feels secure. That also plays out on an emotional level: there is a well-documented tendency for people to prefer familiar things.

In the realm of investments, there are several phenomena related to this tendency. The first is a gross over-reliance on employer stock for retirement investing purposes. From a risk perspective, it may not be a good idea to invest your money in your employer's stock. After all, if the company goes bankrupt, you lose your retirement savings along with your job and your income. But current data suggest that, even after the well-publicized cases of Enron or Lehman Brothers, more than half of all employees in the United States who can invest their retirement savings into their employer's stock do so.¹²

The same tendency affects international investing. While the standard recommendation of capital market theory is to diversify your portfolio as much as you can, investors massively overweight their own country. According to the IMF, the share of domestic equities in US portfolios in 2005 was 87 percent; for German portfolios, 72 percent.¹³ Given the shares in world market capitalization (43 percent and 3 percent, respectively), the attraction to familiar territory is overwhelming for investors. As a result, they are under-diversified, implying that they are exposed to too much risk for a given level of returns, or they forego returns for a given level of risk.¹⁴

Behavioral solution: cast your net widely

In an investment context, the familiarity bias can be countered by overcoming the emotional affinity for the familiar by making a conscious decision to diversify a

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portfolio as widely as possible in terms of geographies, asset classes, and securities within these asset classes. As this is difficult for private investors, the institutions of financial advisers and the mutual fund industry emerged to deliver decision support and easy-to-use tools.

In the realm of innovation, the familiarity bias corresponds to the not-invented-here syndrome. Instincts suggest that the ideas generated internally are superior or more feasible than those coming from external sources. Familiarity with the context and the background of new ideas is higher, and it is easier to connect the dots.

The other consideration pertains to which sources feed an innovation portfolio and which ideas enter an innovation portfolio. To avoid the familiarity bias, innovators need to diversify their sources of ideation in the same way investors need to diversify their investments.

Viewing innovation from a behavioral perspective can lead to more effective innovation processes and outcomes



Consider the case of Freudenberg, a German manufacturing company with 37,000 employees and a presence in 57 countries. Freudenberg Sealing Technologies, the biggest part of the company, introduced a holistic innovation approach to expand its sources of ideation. The company developed a systematic trend-monitoring system grounded in its respective market segments. These trends are discussed with clients to map them to client problems and needs, and to collect feedback at a very early phase of innovation. In the product development phase, carried out in a dedicated and interdisciplinary innovation center, Freudenberg integrates external experts, mostly from academia, to access new perspectives and lateral thinkers. The company maintains close relationships with universities, intensively cooperates with university chairs and research projects, and regularly discusses trends that are important to the company in trend forums or during tech days with clients, experts, and industry participants. This external ecosystem and the constant external feedback in every phase of the innovation process help the company to have diversified sources of ideation and to steer the innovation process in a market-oriented manner.

Good behavior

Viewing innovation from a behavioral perspective can lead to more effective innovation processes and outcomes. In this sense, a behavioral approach does not compete with other approaches to innovation management. It is a framework to reflect on existing practices, identify weak spots, and provide direction. Furthermore, it can foster an awareness of the biases born of our routines and our intuitions. The rise of behavioral finance demonstrates that taking cognitive biases into account can help investors improve the performance of their investments, and may be quite illuminating with regard to improving the returns on their investments in innovation.

Reprinted from Deloitte Review, issue #15: 2014

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