
COMMENTARY

Cognitive Dissonance: The Problem Facing Behavioral Finance

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Cognitive dissonance, as defined by its pioneering researcher Leon Festinger, is the state of mental tension that occurs whenever a person holds two cognitions (ideas, beliefs, etc.) that are psychologically inconsistent. For example, you have a good and generous friend who has just been identified as a thief. In such a situation you experience the discomfort associated with your belief in the goodness of the person who is now contrasted against the evidence that he/she is dishonest. Thousands of experiments and clinical observations indicate that in such situations individuals attempt to reduce the tension by selectively analyzing the facts to reduce the inconsistency. Because most people have reasonably positive self images, believing themselves to be competent, moral and intelligent, their efforts to reduce the dissonance will be constrained to not damaging their prevailing self image. Usually dissonance reduction will be constrained by the desire not to take a position that is contradictory to one's currently held beliefs. Where decision makers have incurred great costs to acquire their current beliefs or positions of status and where the benefits of accepting an alternative viewpoint are uncertain, resistance to belief change will be strong and self justification almost overwhelming. Also, the more costly a changed position, in terms of time, money, effort and the more irrevocable its consequences, the greater will be the dissonance and the felt need to reduce it.

In most circumstances people do not change their existing beliefs when confronted with inconsistent evidence. More often they dig in their heels and become overconfident about their current beliefs. If they do begin to feel unsure they usually engage in various activities to justify their existing beliefs. The most common phenomenon of this kind is confirmation bias. When engaging in confirmation bias, the decision maker, often non-consciously, sorts through the evidence, paying greater attention to facts that substantiate

his/her former position. Quite often memory itself becomes a party to the process wherein confabulation, or the non-conscious construction of non-existent memories, takes place as support for the status quo. In extreme cases the advocates of alternative positions are stigmatized and their arguments are rejected on the basis of some perceived general "inferiority" of the group as a whole.

What, you may ask, has this to do with behavioral finance? Aren't behavioral finance advocates engaged in a scientific search of the truth just like their traditional brethren? Isn't science based on an objective evaluation of the facts? Unfortunately extensive evidence confirms that cognitive dissonance is as much, and possibly even more, of a problem for scientists than the man in the street. No doubt the problem is made more acute in the sciences because of the almost apprentice-like environment between professor and graduate student and the strong hierarchical culture of most universities and scientific laboratories. To step outside of the established paradigm is to endanger one's career and professional reputation. There is just too much ego and high sunk cost to be jettisoned. Scientific heresy is no less heinous a sin than is religious heresy. In addition, especially in Western cultures, mistakes are seen as the result of incompetence or stupidity and so decision makers are especially reluctant to let go of cherished beliefs. In spite of what people profess about the positive value of mistakes, most people would rather wait to be proven wrong by others than to admit it themselves.

It is no secret that behavioral finance is a thorn in the side of many finance traditionalists. Some of this negative perception may be related to a fear that finance will regress to being perceived as scientifically "weak" as it was before the 1950s. However, the more serious issue is that recent research in decision science, biology, psychology, neuroscience and experimental economics suggests that the principal assumptions underlying traditional finance are seriously in error and need to be revised. This by itself would be reason for much cognitive dissonance. However, the situation may be far worse because recent multidisciplinary research suggests that the penultimate objective, financial optimization through

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the application of normative techniques based on axiomatic models, appears to be unattainable. Instead financial professionals may have to settle for techniques yielding second best or just “satisfactory” solutions and where market dynamics can only be discussed in terms of tendencies and directions, not rigorous equilibrium conditions. The 19th century Newtonian promise of a universe made predictable by scientific reductionism and psychological behaviorism may have to be surrendered to the dynamic disequilibrium world of the complexity theorists and evolutionary psychologists.

TRADITIONAL FINANCIAL DECISION-MAKING THEMES

Traditional finance is composed of many different theories and mathematical models of investment behavior. Behind each is a varying set of assumptions about personal behavior, institutional practice and the larger environment within which financial decisions are made. For example, some people believe that capital markets are very efficient, while others do not. However, for purposes of this essay I will focus on four overarching themes which underpin traditional financial models but that set the stage for a significant cognitive dissonance problem relative to behavioral finance. The examination of these broad themes, which concern fundamental issues about science and the nature of man, reveals the major fault lines between traditional and behavioral finance. Some writers have tried to “paper over” the problem by suggesting that the traditional models are special cases of a more general behavioral model, much like Newtonian physics can be seen as a special case of a more general model that also embraces quantum theory. However this characterization is not helpful because most traditional models are based on assumptions that are not mere simplifications of a more general behavioral paradigm. They are based on assumptions that are demonstrably in conflict with scientific evidence. Also, from a practical perspective, the Newtonian physical model gives good operational results (e.g., structures constructed on its principles generally don’t collapse) while many traditional financial models do not (e.g., beta at best has poor explanatory power), suggesting that they may be based on assumptions that are inconsistent with more general laws of nature and behavior.

Four broad themes underlying traditional finance are as follows.

1. Reductionist science can “conquer” uncertainty. That is, with enough effort, cause and effect can be understood to the degree that at the very least, stochastic models can be constructed that will facilitate optimization.
2. The human mind is a general problem solving device, like a computer. Therefore, it can be trained (programmed) to make axiomatic decisions focused on optimization.
3. Emotions have a negative influence on decision making because emotion is the antithesis of rationality.

4. Humans are predisposed by nature to be selfish and to act for personal gain.

THE BEHAVIORIST REJOINER

First, Quantum theory and now Systems or Complexity theory show it is not always possible to eliminate uncertainty even if system parts are well understood. Certain types of systems give rise to emergent states that have properties that are not properties of the parts or elements of the system. Even in a priori axiomatic systems, such as mathematics, there will be certain theorems that can never be proven. In general, economic systems have positive as well as negative feedback, and it is the positive feedback that gives rise to a dynamic system that may not approach equilibrium. Many economists have already recognized this problem and research in the area has given rise to the sub field of “Agent Based Economics” or “Econophysics.” It is acknowledged that the search for optimization in an environment with intractable uncertainty is pointless and from a logical perspective involves an infinite regress.

Second, evolutionary psychology and neuroscience have brought forth much evidence that the human mind is not a general problem solving device, like a computer. More specifically, the human brain is a cobbled together organ that functions acceptably to facilitate adaptation and reproduction. It does not function in manner designed for outcome optimality but only outcome sufficiency. In addition, decision processes do not have to be beneficial to each decision maker but only to the phenotype.

Third, emotions are an essential part of decision making because emotion is the necessary trigger to an action state. Individuals who are without emotion tend to make poor decisions, if they can be said to make decisions at all. The inborn human decision system seems to comprise two processes that operate in tandem but with different weights depending upon the circumstance. The “experiential process” is faster, more non-conscious, and makes use of rules of thumb or heuristics. The “rational” system is newer from an evolutionary perspective. It operates more slowly, and can make more formally logical decisions where the decision environment is relatively simple. These two systems share neural circuits and one cannot by training or force of will shut down one system and act according to the other. When the two systems don’t operate in tandem, inferior decisions result.

Fourth, humans are social beings and much evidence suggests that decisions are made with an eye toward others. In particular, people seem instinctively predisposed to imitate others and that they have a need for group membership. Research from experimental economics, game theory, decision science and psychology indicates that decision makers not only engage in altruistic behavior toward family and continuing acquaintances (reciprocal altruism) but also toward

strangers. From an evolutionary perspective such behavior is adaptive, and it would be extremely surprising if it did not exist.

DIFFERENT MODELS, DIFFERENT EXPLANATIONS

Are there any significant issues where we observe traditionalists and behaviorists proposing alternative explanations? There are many. These include the measurement of risk, investor “herding” or “crowd following” and investor overreaction. Each of these has generated a very large and complex literature. However, I will attempt to summarize how the traditional and behaviorist paradigms lead to alternative explanations of these phenomena.

Financial Risk

Most traditional models treat financial risk in a probabilistic fashion. More specifically, risk is usually assumed to be function of the variance of a distribution of possible returns. The greater the variance, the greater the risk. The difficulty with this metric is that it is a property of the investment hazard but not necessarily a measure of how the hazard is perceived. That is, variance was mathematically derived by combining the five standard axioms of utility theory (completeness, transitivity, independence, measurability and ranking) with the assumptions of non-satiation and risk aversion. A Taylor Expansion upon the utility function yielded variance as a mathematical product. In this context it is important to remember that risk aversion did not say how investors perceive risk. It only asserted that investors prefer a sure thing to a fair gamble with the same expected value. Thus variability of return was not derived from physiological or psychological assumptions of how people perceived or “felt” uncertainty. Thus, as a risk metric variance or variability in return has axiomatic validity but not necessarily ecological validity. As a measure of perceived risk and an instigator of action it is scientifically ad hoc.

More recently the concept of ambiguity has also been reintroduced into traditional models. However, once again it tends to have the same probabilistic “flavor” in that ambiguity is most often modeled as “probabilities about probabilities.”

Beta as a risk measure is also psychologically ad hoc. It not only assumes that variance is perceived risk but also that investors are aware of covariance and are able to deal with it computationally. Both of these assumptions fail empirical investigation.

Alternatively, behavioral finance models tend to see risk as a multiattribute perception. This viewpoint is grounded in research indicating that human decision makers operate as if they have two inborn decision processes. The first process is referred to as the “experiential or associative process,” generating what are experienced as intuitive or affective responses.

The experiential system encodes information in the form of concrete exemplars images and narratives. Experiential information processing tends to be holistic and very context sensitive. It is the older of the two processes and tends to be the default process when decision time is short, information is uncertain and the decision is complex. This process is the one that creates the feeling that a decision must “feel right as well as look right.”

The second decision process is called “rule based” or “rational.” In this process information is symbolically represented and processing rules are culturally based and socially learned. Information is evaluated and integrated using formal logical analysis as opposed to informal association. This process performs well when decisions are relatively simple and there is a unique goal or objective.

Neuroscience evidence indicates that both processes must be simultaneously functioning for appropriate decisions to be made. In addition, because the experiential system can operate outside on conscious awareness, it can influence the rational system without its recognition.

The dual decision process system appears to be responsible for perceived risk having many dimensions besides variability in return. For example, risk is most importantly a function of the chance of loss, or coming up short. That is, investors are loss averse, not risk averse. In addition risk is a function of familiarity, perceptions of personal control, trust, and perceived fairness. Most surprising, perceived risk often appears to be an inverse function of expected return. High return investments are often perceived to be of low risk. Affect appears to be the cause of this inverse association. When something is “felt” as favorable, that positive feeling colors beliefs about the other dimensions of the decision.

Herding and Crowd Following

Herding refers to the situation where forecasters or investors tend to “shade” their forecasts or investment decisions in the direction of a reference group. The reference group may be colleagues or other market participants. “Home bias,” wherein investors tend to favor the stocks of firms from their own geographical region or employer, also has an affinity element making it similar to herding or crowd following.

Traditional financial theories tend to hypothesize herding and crowd following as rational responses to differences in information quality, professional competence or market influence. Investors with lesser quality information, professional competence or market influence mimic the behaviors of their “superiors” in an attempt to benefit from the association without incurring high cost. In all cases the decision is conscious, purposeful and taken as part of a devised strategy.

Behavioral finance theorists suggest some additional more non conscious and affective reasons for herding and crowd following. For example, humans appear to associate group size with risk. Larger groups are seen to be an indication of reduced risk. In addition, group membership is associated with positive affect and a feeling of well being and lower risk.

Both of these perceptions contribute to a basic herd mentality that humans share with other social animals. The herd mentality is much enhanced in situations of heightened uncertainty. Such behavior is ecologically adaptive for a species because, on average, it reduces vulnerability even though it can be maladaptive in isolated circumstances.

Regarding “home bias,” there is a growing body of evidence it is associated with the “familiarity as risk” phenomenon. That is, people associate familiar objects, ideas, situations, etc. with less risk. This appears to be caused by the positive affect of familiar circumstances.

Overreaction

Overreaction has many faces. However, the principal features are asset prices that appear to be overly volatile or that reach values that appear to be unjustifiable based on economic fundamentals.

As with herding and crowd following, traditional financial models tend to look for rational explanations for overreaction. Usually these have to do with technical forecasting and learning problems of some type. However, some traditionalists associate overreaction with the hubris of “noise traders.” Overreaction tends to persist because of transaction costs or other market impediments that reduce arbitrage opportunities.

Behavioral finance theorists have identified a number of alternative channels of over reactive influence. One just mentioned is the affectively mediated relationship between perceived risk and return. In particular it is sometimes the case

that high return is associated with low risk. In such a situation the two influences become a source of positive feedback pushing prices to very high levels. There is some evidence that this is a primary channel of influence in the case of initial public offering (IPO) premiums. Another behavioral model suggests that overreaction stems from overconfidence and attribution bias on the part of some professional investors. The overconfidence causes them to overweight their own private information and underweight public information. This model also allows underreaction to occur at some times. Overconfidence and attribution bias are two of the most well studied and documented behavioral phenomena.

WHERE TO?

A primary lesson from dissonance theory is that we can't sit around waiting for others to have a change of heart or mind. Because human tunnelvision is not self correcting, there have to be external correction mechanisms. External scientific peer review is a good starting place, but there must be vehicles to carry the new ideas to the intended audience and there must be incentives and resources to support the effort. This is where organizations such as the Institute for Behavioral Finance and the *Journal of Behavioral Finance* become indispensable. More important, a significant effort must be made to reach the professionals just beginning their financial careers because it is these individuals that are less burdened with the baggage of the current paradigm and have a longer expected period of creativity.

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