

# **“Behavioral Economics: Implications for Enterprise Risk Management”**

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## **Abstract**

Enterprise risk management (ERM) continues to evolve as an important process and collection of risk management techniques. Because of its growing significance and continuing staying-power, it is critical to consider how ERM responds and relates to circumstances and conditions. In particular, one megatrend currently impacting our world and our understanding of the economy is the emergence of a behavioral economics perspective. This paper describes the nature of behavioral economics, and considers the potential impact of such a perspective on ERM.

## **Section 1: Introduction**

Enterprise risk management (ERM) continues to evolve, increasing in importance and sophistication in a variety of industries. As a perspective by which risks are identified, quantified, and managed, ERM can be considered both as a critical process, and as a collection of advanced risk management techniques, both quantitative and qualitative. Because of its growing significance and continuing staying-power, it is important to consider how ERM responds and relates to circumstances and conditions in the economy and around the world.

Among the several conceptual trends that appear to be changing our living and operating environment, the following contexts are examples of ones with significant potential impact on ERM:

- Economies and organizations viewed as *complex systems*
- Economies considered as *evolutionary processes*
- Human dynamics reflected by *behavioral economics*

This paper concentrates on the last of the above-listed concepts. The paper describes the nature and emergence of behavioral economics, and considers the potential impact of this perspective on human behavior and dynamics on the ERM process. The goal is to begin to provide a foundation of understanding for consideration of possible responses by ERM practitioners to certain behavioral cognitive dissonances.

However, before proceeding with the discussion of behavioral economics, a few brief words regarding the first two conceptual trends mentioned above.

#### Complex Systems

A *complex adaptive system* (CAS) is a system of individual interacting “agents” which adapt to changing conditions. The characteristics of a CAS include:

- The system is built, and best appreciated and understood, as a *bottom-up*, rather than a top-down, system. The micro-units of the system interact and aggregate to form its macro-structure – and the macro-structure may well have properties and characteristics that are not obvious extensions of the properties at the micro-level.
- The system *self-organizes*, exhibiting *emergence* and nonlinearities – the micro-versus-macro “disconnect” mentioned above.
- The system is *irreducible*.

Some potential examples of CASs include economies, ecologies, consciousness, and organizations. While much attention has been paid to complex systems over the last decade or two, this is really not a new idea – historical recognition of a complex systems perspective in economics goes back at least to Adam Smith and his famous line alluding to the “invisible hand” and the “disconnect” between intentions and ends:

“He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.”

-*An Inquiry into the Nature and Causes of the Wealth of Nations*,  
Adam Smith, 1776

### Evolutionary Processes

Viewing economies as evolutionary processes is mentioned as a conceptual trend above because of the parallels between economic systems and biological evolutionary theory. Both areas involve complex systems, self-organization, emergence, and adaptation (in biology, this largely takes the form of natural selection). Also, as is so true in most areas of inquiry (but too often ignored as a possibly interesting but mostly irrelevant side issue), appreciating how both economies and ecologies evolved over time can help us to understand, explain, and ultimately model their current statuses and dynamics.

A number of both old and recent texts have made and advocated this connection between economic theory and biological evolution. Three quick examples:

- A paper titled “Why is Economics Not an Evolutionary Science?” by Thorstein Veblen appeared in the *Quarterly Journal of Economics* in 1898. The title says it all.
- A book by Paul Ormerod, in 2005, titled *Why Most Things Fail: Evolution, Extinction & Economics*, discusses a variety of connections in this area, including the observation that both company failures and species extinctions have historically exhibited similar patterns:

“The precise mathematical relationship which describes the link between the frequency and size of the extinction of companies, for example, is virtually identical to that which describes the extinction of biological species in the fossil record. Only the timescales differ.”

- From arxiv.com in 2010, in a paper titled “Structure and Response in the World Trade Network,” authors He and Deem describe global trade in biological terms, and find that this bio-perspective ultimately leads to an interesting conclusion:

“... treating the world trade network as an evolving system... globalization... should lead to increasingly large recessions and decreased rate of recovery, in contrast to standard economic understanding.”

We have mentioned the first two conceptual trends – complex systems and evolutionary processes – because they are related to, and can help us understand, the nature and existence of the *cognitive dissonances* being uncovered by recent research in behavioral economics and cognitive neuroscience.

## Section 2: Behavioral Economics and ERM

This paper concentrates on the last of the conceptual trends listed in Section 1, behavioral economics, and its potential impact for ERM. By ERM is meant a risk management process which:

- Takes a *holistic* financial and operating perspective.
- Recognizes *interdependencies* among corporate, financial, and environmental factors.
- Strives to determine and implement an optimal *strategy* to achieve the primary objective: *maximizing* the *value* of the firm.

Recent investigation into the behavioral realities of people making economic and financial decisions began largely as a reaction against the traditional economic assumption of “*Homo economicus*” – the completely rational human who makes economic decisions in a perfectly rational way at all times. While over the years economists have largely been willing to admit that such an assumption is technically somewhat realistic, the approximation has been viewed as a reasonable working principle for theoretical purposes. This perspective on human behavior led to such mathematical frameworks as expected utility theory.

However, Kahneman & Tversky began looking at human behavior from a psychological perspective, introducing and implementing a series of illuminating tests and experiments which indicated a number of serious “cognitive dissonances” that imply just how far off from “perfectly rational” human behavior actually is. Mathematically, their investigations led to prospect theory and cumulative prospect. More generally, their work led to the identification of a number of “irrationalities” or “cognitive dissonances” inherent in human behavior which often prevent us from making optimal and/or consistent decisions.

The traditional economic approach of *homo economicus* has resulted in a virtually deterministic approach to human behavior, essentially a Newtonian version of human dynamics. Yet, the idea that economists (and financial economists, actuaries, and risk managers) should consider such social sciences as psychology, social anthropology, etc., when reflecting upon or modeling human behavior is not completely new:

“One must study the laws of human action and social cooperation as the physicist studies the laws of nature.”

-*Human Action*, Ludwig von Mises, 1949

### Section 3: Cognitive Dissonances

When describing empirically observed deviations from the *homo economicus* model, the term “cognitive dissonances” is preferred by the author to a term like “irrationalities.” It is difficult to label something irrational unless one is completely certain that all possible parameters and variables have been identified for what is rational. While many are comfortable referring to cognitive dissonances as irrationalities, the author suspects that, through advances in neuroscience and brain science, additional factors may well be discovered that at least partially explain certain human behaviors, and may thereby make them seem less irrational, or at least more understandable. In fact, this is a significant benefit that can be derived from examining human evolution: many behaviors seem more understandable in the light of the historical evolutionary process.

Below is a selection of some behavioral cognitive dissonances. While this list is not complete, it provides a flavor for the types of considerations involved in performing enterprise risk management and making decisions based upon an ERM process.

- **Anchoring** – bias toward an initial or previously observed value.
- **Availability** – bias toward the more recent or available information.
- **Framing** – based on the empirical observation that a reference point, or the frame of reference, affects how risk is perceived.
- **Loss Aversion** – the endowment effect: we have a deep or even distorted dislike for losing what we already have.
- **Optimism** – overconfidence in our abilities and knowledge.
- **Representation** – we sometimes characterize things based on only a few essential features, ignoring differences in other features and details.
- **Risk Aversion** – we avoid risk when it comes to gains we have made (although we tend to be risk-seeking with losses).

Because of dissonances such as these (and others), people have difficulty evaluating probabilities. We often anchor on a previous value (which may or may not be valid any longer), or we link a new type of risk conceptually with another type of risk based on one or a few essential features which both have in common (although the details and subtleties of the risks may in fact be quite different).

One important area for misunderstanding or misperception of probabilities – perhaps leading to either under-appreciation or exaggeration of one’s own prospects – is health and health care. In his 2000 book *The Culture of Fear: Why Americans are Afraid of the Wrong Things*, Barry Glassner states:

“Women in their forties believe they have a 1 in 10 chance of dying from breast cancer, a Dartmouth study found. Their real lifetime odds are more like 1 in 250.”

In any risk assessment situation, whether personal or corporate, an ineffective or inaccurate evaluation of risk potential can be extremely serious, leading to sub-optimal (to say the least, in some cases) operational decisions.

#### **Section 4: Implications for ERM**

There is a clear need, from several perspectives, for actuaries and risk managers to understand and appreciate behavioral issues and human dynamics. First, when analyzing underlying loss and risk data, it is important to understand the production source of those data – say, the nature and types of entities and consumers involved. The full and adequate interpretation of data may be aided by knowing, for example, whether behaviorally-informed marketing efforts (which are becoming more and more common) were utilized in selling a product.

Second, and more directly relevant for ERM, it is important to avoid or account for cognitive biases when discussing and estimating risks and their parameters. One can easily imagine a firm’s risk committee, sitting around a conference room table, sequentially trying to quantify risk probabilities; the potential for “anchoring” probabilities from consideration of one type of risk to the next, or from one participant’s numerical predisposition regarding a certain type of risk, for example, is evident. In addition, the manner in which risk discussions are presented and framed has the potential to be highly influential.

#### **Section 5: Conclusion**

In this paper, a brief background and description of behavioral economics has been presented. It is hoped that the potential of behavioral cognitive dissonances to impact actuarial and risk management processes will be recognized and appreciated. Future papers will discuss specific cognitive dissonances in more depth, and suggest possible responses to them by the ERM process and its practitioners.

### *Suggested Books*

Here are several recent books, meant mostly for a general or popular audience, that explore various aspects of human behavior and its relationship to economics and finance.

- *The Believing Brain* – Michael Shermer (2011)
- *The Mind of the Market* – Michael Shermer (2009)
- *Animal Spirits* – George Akerlof and Robert Shiller (2010)
- *Predictably Irrational* – Dan Ariely (2008)
- *Nudge* – Richard Thaler and Cass Sunstein (2009)