

# Leveraging Behavioral Economics to Decision Architecture

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## ABSTRACT

Modern economic theory has been dominated by neoclassical economics since the 1970s. Like any theory, neoclassical economics also has a series of assumptions underpinning it. These assumptions have been criticized and challenged on various grounds in the past several decades. The most serious assumption is the assumption of rational economic agents who aim to maximize their utility by analyzing the costs and benefits of every decision. The presence of "homo economicus" is very rare in our society. In fact, it is practically and psychologically impossible to be rational even most of the times. Empirical and experimental research heavily corroborates this fact. Despite such massive evidence, nearly all economic models and public policies use this distorting assumption in analysis and research. The result has been catastrophic, as can be seen in the Global Financial Crisis of 2008, the Dot-Com bust and numerous financial market crashes before that. Furthermore, the theory of rationality also reduces the effectiveness of government policies in achieving their objectives. Behavioral economics has emerged to address these fallacies of modern neoclassical economics and complement it to improve economic theory, methodologies and forecasting. Behavioral economics has mainly two branches

macro theory which aims to design macro-economic models incorporating behavioral concepts and micro theory which explains the various biases that individuals, groups and institutions exhibit in economic and even social decision-making. This research is focused on micro-behavioral economic theory. While a colossal magnitude of research has been done in identifying, testing and explaining the plethora of behavioral biases, there is a dearth of research on systematically reducing these biases. This research aims to fill this gap by conducting research on private and public sector employees of 30 to 40 years age and testing for a significant difference in level of biases revealed between the two groups of employees. The research found that there is a significant level of difference in the rational decision-making behavior of the two groups of employees. It also discusses the applications of the findings and the further scope for research.

**Keywords:** Behavioral Economics, Behavioral Finance, Behavioral Biases, Decision Sciences, Decision Architecture.

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## INTRODUCTION

The past decade has been a triumph for behavioral economics, the crossbreed of 'Economics' and 'Psychology' (Tim, H. 2014). It was the first time in history that the Nobel Memorial Prize in Economic Sciences was awarded to a psychologist - "Daniel Kahneman" in the year 2002. *Daniel Kahneman* – a psychologist who did as much as anything to create the field of "Behavioral Economics".

The emergence of behavioral economics has provided new insights into economic and business phenomena by integrating elements of economic theory and experimental psychology. So far, the behavioral economics research agenda has concentrated on the empirical validity of foundational assumptions, producing new descriptive accounts of behavioral

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patterns that are difficult to explain using traditional neoclassical assumptions. This agenda has now developed sufficiently to begin exploring how to apply these descriptive findings to improve human performance, business decision-making and economic policy (Berg, N., 2007). Forging a new normative economics based on behavioral theory is an ambitious project. The dynamic framework for understanding and

leveraging behavioral economics to improve decision-making across the organization needs to be studied.

Behavioral economics applies psychological insights into human behavior for economic decision-making. It studies the effects of emotional, psychological, cognitive and social factors in the economic and social decisions of individuals and organizations. It is related to the much-discussed bounded rationality model (bounded rationality refers to the limited intellectual capabilities of human beings). Models in behavioral economics take theories and concepts from psychology, psychiatry, neurosciences and microeconomics. Behavioral economists have shown through experimental and empirical research that people are systematically and predictably irrational in their actions that defy economic logic. Behavioral economists have researched and come across a series of predictable errors that humans commit while judging situations and evaluating risks. These errors are called biases.

From a philosophical point of view, Behavioral Economics is basically a theory of choice and decision. Every field in modern society such as finance, public policy, humanities, and sciences require decision making. The beauty of this theory is that it can be applied to all these fields. Jeremy Bentham, the famous philosopher wrote extensively about the psychological underpinnings of utility theory and analysis.

Theories of decision can be broadly classified into positive and normative theories. Positive theories describe decision-making as it happens in reality and day to day life. It does not make any value judgments as to the quality of those decisions. On the other hand, normative theory describes what decisions should be taken to improve the quality of life of the decision-maker. Neoclassical economics is characterized by such a theory of rational choice which is presented as both positively adequate and normatively correct, that is, it describes the real world and is the best way to make decisions. The quandary is that such a theory has never existed. According to conventional finance theory, all investors whether individual or institutional are strictly rational wealth and income maximizers. However, we daily see irrational financial decisions being taken due to paucity of time, mental resources and emotions.

### Allais Paradox

The Allais paradox is a choice problem designed by Maurice Allais (1953) to show inconsistencies of actual observed choices with the predictions of expected utility theory. The Allais Paradox appears when analyzing participants' choices in two different

experiments, each of which consists a choice between 2 different speculative investments or gambles.

### Regret Avoidance Bias

Regret avoidance is when a person wastes time, money and effort or takes specific strategies to avoid experiencing regret over an initial decision, in the present or in the future. While making financial decisions, investors take a host of precautions to avoid regret in the future.

### Prospect Theory

Prospect Theory was discovered and formally presented by Kahneman and Tversky in their seminal paper *Prospect Theory: An Analysis of Decision under Risk* in 1979. Daniel Kahneman, in his bestseller book, *Thinking Fast and Slow*, explains that since all decisions involve uncertainty about the future the human brain you use to make decisions has evolved an automatic and unconscious

system for judging how to proceed when a potential for loss arises.

### Bundling and Reference Points

A Value/Utility function describes the utility of an additional amount of a resource (usually money) to a person. Conventional economics states that an amount of money earned gives a fixed utility to a person. Even if we segregate the money into 3 parts and give it to him as a series of payments it should not alter his utility. However, this is actually not observed in reality. The pleasure received by winning 3 smaller prizes is greater than receiving 1 large prize for almost every human.

### Integration of Losses

Convex utility (or rather disutility) functions have an interesting insight into human psychology – a large loss is preferable to a series of small losses. This is a direct violation of neoclassical microeconomics which would state that a rational individual would only take into account only the total effect and think and take further decisions accordingly. However, if the losses are suffered sequentially then the individual's utility function and reference point will revise every time and he will experience more pain.

### Hedonic Editing Hypothesis

We just discussed that the segregation of gains, integration of losses etc. make people happier and experience a higher level of satisfaction. This habit of people is called hedonic editing, they reorganize the



events in their life to reduce dissatisfaction and increase satisfaction with life. Unfortunately, people don't do it often enough, as is evident by the fact that we need our parents, siblings, spouses, friends and therapists to help us realize the good things in our life and negate the bad things. Hedonic Editing is a very useful strategy frequently adopted by therapists to alleviate the pain of their patients.

### Sunk Cost Fallacy

It is also known as escalation of commitment. In economics, a sunk cost is any past cost that has already been paid and cannot be recovered. For example, the US invested billions of dollars in the Vietnam War, supporting South Vietnam against the communist North led by Ho Chin Minh. So when the popular sentiment turned against the war in US society, the government should not have taken the lost money and lives in taking the decision to withdraw. Individuals indulge in the sunk cost

fallacy when they continue a behavior, project or endeavor as a result of previously invested resources.

The sunk cost fallacy is stronger when the amount already invested is higher, that is, there is a direct correlation between the magnitude of sunk cost and irrational behavior exhibited.

### Anchoring

An anchor is a reference point, a rule of thumb or a heuristic that is used by people when making decisions but may not have any direct or indirect relevance to a decision, but it nonetheless affects people's judgments. The credit card tip system operated in New York Taxis is another clever anchor. Under this system, the credit card system automatically suggests a 25 to 35% tip. By this rule of thumb, a 20% tip seems low and hence passengers end up tipping 20% of the cab fare. Prior to this system, the average tips were only 8 to 10%.

### Decoy Effect

The decoy effect influences the choice decisions of decision-makers, especially during shopping for convenience and durable goods. Choices often occur relative to what is on offer rather than based on absolute preferences as proposed by the consumer choice theory of neoclassical economics based on stable preferences, indifference curves and budget lines. The decoy effect is a strategy where a person changes his preferences between 2 given options when presented with a third option which is no good! In decision theory parlance this option is called asymmetrically dominated, that is, its clearly worse than one of the options. The

asymmetrically dominating option is the one that becomes preferred by most decision-makers.

One of the earliest decoy pricing was adopted by the magazine The Economist. The magazine offered 3 editions – a web version for \$60, a print version for \$125 and a web + print version for \$125 version. The middle option is asymmetrically dominated by the last option. The beauty of this strategy is that the combo version becomes very attractive and people opt for it instead of the web version.

### Framing Effects

Framing is a very important cognitive bias on the intersection of behavioral economics and psychology. Choices can be presented in a way that highlights the positive or negative effects of the same decision, leading to changes in

their relative attractiveness. This is in complete violation of standard economic theory which assumes perfectly rational agents with perfect information. This is a very important cognitive bias where people react in different ways to the same choice contingent on the way presented to them. Framing plays a very important role in people's everyday decisions and policymakers have used it to nudge people towards better decisions.

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### Status Quo Bias

People have an overwhelming desire to maintain the status quo and not make any efforts on their part to change, even when it will yield sizable benefits to them and the transition costs are negligible. *"One extreme example of reluctance to join an attractive retirement plan comes from the United Kingdom, where some defined benefit plans do not require any employee contributions and are fully paid for by the employer. They do require employees to take action to join the plan. Data on 25 such plans reveals that only half of the eligible employees (51%) signed up."* (Benartzi and Thaler, 2007). This is also called inertia in behavioral economics.

## REVIEW OF LITERATURE

### Firstly

in this section of my review of literature, I would like to through light upon all those economists who have

made remarkable contributions to the field of Behavioral Economics and successfully brought it to the mainstream economic theory. The pioneers of Behavioral Economics are Amos Tversky, Daniel Kahneman, Richard Thaler and Dan Ariely.

### Amos Nathan Tversky

Was a cognitive and mathematical psychologist and a giant figure in the discovery of systematic human cognitive bias and handling of risk. He was a professor at Hebrew University, Israel and Stanford University, Palo Alto, California. Daniel Kahneman is the recipient of the Nobel Memorial Prize in Economic Sciences in 2002 (which he shared with Vernon L. Smith). He is an Israeli-American psychologist

famous for his work on the psychology of decision-making and judgement. He has worked in Hebrew University, Israel and University of California, Berkeley. Richard Thaler is the recipient of Nobel Memorial Prizes in Economic Sciences in 2017. He is popularly known as the father of behavioral economics. He has done seminal research work in behavioral economics and behavioral finance. He has been associated with University of Rochester, Cornell University and is currently the Charles R. Walgreen Distinguished Service Professor of Behavioral Science and Economics at the University of Chicago's Booth School of Business. Dan Ariely is a double PhD holder in Cognitive Psychology (University of North Carolina at Chapel Hill) and Business Administration (Duke University). He is the writer of several bestsellers on Behavioral Economics such as *Predictably Irrational*, *The Upside of Irrationality* and *The Honest Truth about Dishonesty*. He was formerly the Alfred P. Sloan Professor of Behavioral Economics at MIT Sloan School of Management and at the MIT Media Lab. Currently he is the James B. Duke Professor of Psychology and Behavioral Economics at Duke University. Robert Shiller is a pioneer in the field of finance and has done extensive work in Behavioral Finance. He was one of the few economists who had indicated the real estate and stock market bubble in the run up to the Great Recession of 2008. He jointly received the Nobel Memorial Prize in Economic Sciences in 2013 for his work on asset prizes. All these economists have made remarkable contributions to the field of Behavioral Economics and successfully brought it to mainstream economic theory.

### Secondly

In this section of review of literature, I have presented the remarkable contribution of all the above-mentioned

pioneers of behavioral economics. Allais (1953) discusses the Allais Paradox and the theory of choice and decision under risk. Kahneman and Tversky (1979) discussed prospect theory for the first time and put Behavioral Economics on the forefront of research. In the paper they put forward the idea, intuition and logic behind Prospect Theory and how it was completely at odd with standard economics. Thaler (1985) built upon prospect theory and proposed an alternative to the expected utility theory of neoclassical economics. He discussed the segregation of gains and integration of losses and their corollaries separating small gains from large losses and canceling small losses against large gains. Thaler and Shefrin (1981) discuss the self-control problems associated with savings and other utility maximizing activities that involve short-term loss and long-term gains (but the net present value being explicitly positive). Kahneman and Thaler (2006) have given

strong arguments against the utility maximization theory of neoclassical economics. They discuss that utility is of two kinds- decision utility which refers to the "wantability" of certain goods, or the choice of the consumer, and experienced or hedonic utility, which refers to the happiness received when consuming those goods. The consumer decides at time  $t_0$  that will affect his consumption at  $t_1$ . This distinction was well acknowledged in 19<sup>th</sup> Century Economics. Unfortunately, experienced utility went completely out of economic discourse in the 20<sup>th</sup> Century and all attention was focused on the former kind. However, it is empirically, experimentally and by common sense well defined that people systematically and regularly choose products (under the influence of emotions, bounded rationality and so on) that they later regret. Kahneman and Renshon (2007) have detailed the biases that foreign policymakers exhibit when dealing with a foreign adversary. They explained the vision problems that leaders suffer from and their inability to accurately understand the motives and intentions of their counterparts on the other side. They also mentioned "reactive devaluation", the phenomenon when something offered to us from the other side (say enemy nation, even a shopkeeper) appears intuitively to be of lower value than what the fundamentals represent. *"In one experiment, Israeli Jews evaluated an actual Israeli-authored peace plan less favorably when it was attributed to the Palestinians than when it was attributed to their own government."*

Mental accounting has been discussed in Thaler (1990). Standard economics says that rational individuals consider money to be fungible and the source of money





is totally irrelevant. Thaler found out empirically that people have several mental accounts to which they allocate money – A present income account, an asset account and a future income account are there in every person's mental diary. Each account has a different marginal propensity to consume (MPC) and all cash inflows go to different accounts based on the amount, source, timing etc. Thaler (1988) discusses the Winner's Curse. It has been observed very frequently in auctions that the winner overbids relative to the intrinsic or fundamental value of the asset. Thaler explained the reasons behind the Winner's Curse by conducting various experimental games among his undergraduate and MBA students.

Benartzi and Thaler (2007) have done massive research in behavioral biases in retirement saving. They have criticized the assumptions of the neoclassical life-cycle or

permanent income models on the following grounds:

*"The standard economic theories of saving (like the life-cycle or permanent income models) contain three embedded rationality assumptions, one explicit and two implicit. The explicit assumption is that savers accumulate and then decumulate assets to maximize some lifetime utility function (possibly including bequests). The first implicit assumption is that households have the cognitive ability to solve the necessary optimization problem. The second implicit assumption is that the households also have sufficient willpower to execute this optimal plan. Both of the implicit assumptions are suspect (Benartzi and Thaler, 2007)".*

Kotlikoff (1992) experimented that Americans who were sent an annual statement by the Social Security Service showing the computation of the amount that they will receive on retirement significantly increased the contributions to individual retirement accounts (IRA). Thaler (1994) discusses the various kinds of retirement savings accounts and the behaviorally optimal retirement scheme that will maximize the amount of savings and contributions. Behavioral economics has many policy applications. In fact, an upcoming branch of Behavioral Economics is Behavioral Welfare Economics which uses nudges and a variety of other strategies to maximise the welfare of individuals and societies. Sunstein and Thaler (2003) discuss libertarian paternalism as a new political philosophy that uses insights from Behavioral Welfare Economics to help people make better decisions. They combine the idea of freedom of choice that will be offered to

individuals and default options being set by policy. They recognize that individuals are vulnerable with bounded rationality and bounded self-control and plan design features (such as retirement saving plans) can be constructed in such a way that benefits them. They criticize the false assumption in most standard economics and law theories that all people almost all the time take decisions that are in their best interest. While the fact that is much closer to the truth is that people take good decisions in those areas wherein they have good knowledge and experience than in contexts where they are inexperienced or poorly informed. Thaler (1989) discusses interindustry wage differentials- a post a secretary for virtually the same job profile and hours is compensated differently in different industries- such as more in auto and finance industries and less in mining and leather industries. This is a clear violation of neoclassical microeconomics which states that employees should be

paid equal to their marginal product. Kahneman and Tversky (1986) analyzed the normative theory of decision-making under risk which has emerged from a logical analysis of games under chance. They argue that the deviation of actual behavior from normative behavior is too widespread to be ignored, too systematic to be dismissed as random errors and too fundamental to be accommodated by relaxing a few assumptions or axioms of the normative system. They have also extensively discussed framing effects on the decisions of people (these effects are discussed extensively in the introduction) which they observed by offering people choices similar to the ones offered in this research paper's questionnaire. Kahneman and Krueger (2006) discuss the limitations of the revealed preference theory which is widely taught and used in standard economics. They observe that people make inconsistent choices, fail to learn from experience, base their utility derived from the utilities of others, are highly reluctant to trade and significantly derive from the standard model of the rational economic agent. Novemsky and Kahneman (2005) discuss how intentions affect loss aversion. When people intend to exchange the good rather than consume it their loss aversion moderates. They find that as people gather trading experience, their endowment effect reduces and they become more willing to trade at realistic prices. Also, if people focus on the benefits that they will receive their loss aversion reduces as well. Previously Ariely (2002) discussed loss aversion and endowment effect in winners of college basketball game tickets and the absurd prices they

asked to part with their hard-won entry ticket. Benartzi and Thaler (1999) explain Myopic Loss Aversion wherein they conducted experiments and observed that people invest more in stocks and other risky assets when they are shown long-term returns rather than 1-year returns. They also noticed that people who observe their investments more frequently become more risk-averse and invest less in equities.

Behavioral economists have also investigated the impact of income on the subjective well-being (SWB) of people. Kahneman and Deaton split well-being into two components – emotional well-being and life evaluation. *“Emotional well-being refers to the emotional quality of an individual’s everyday experience? the frequency and intensity of experiences of joy, stress, sadness, anger, and affection that make one’s life pleasant or unpleasant. Life evaluation refers to the thoughts that people have about their life when they think about it (Deaton and Kahneman, 2010)”*. Through their research they concluded that emotional well-being flattened after achieving an income

level of \$75,000 while life evaluation rose continuously. This indicated that while people’s perceived satisfaction with their life improved with their income level their actual happiness remained stagnant after attaining a certain income level.

### Thirdly

In this concluding section of my review of literature, I would like to say that the literature on behavioral economics has been growing significantly in the last few years, and its findings have become increasingly influential in shaping the agenda of regulators around the world (Pereira, C. M. 2016). Though, behavioral economics is considered a fairly new and largely uncovered field, where so far insufficient empirical systemic knowledge has been accumulated (Galetic, L. and Labas, D., 2012).

Traditional economics often rests on the assumption that individuals act rationally. There are circumstances when the choices made by consumers are not an accurate reflection of their normative preferences, whatever these preferences may be (Pereira, C. M. 2016). There are, in fact, growing evidences that consumers’ rationality is often bounded by a number of factors, notably, information asymmetries and cognitive limitations (Beshears, J. and et al., 2008). Accurate model of decision-making should thus be based on this assumption of ‘bounded rationality’ (Simon, H. A. 1978). The way the behavioral characteristics of economic

agents can affect their rationality has given birth to a flourishing field of research known as behavioral economics.

Ever since their origins about three decades ago, the Behavioral Sciences areas of economics, ethics and managerial psychology have been rapidly evolving. In the 1980’s and 1990’s, early work by *Max Bazerman* in judgment and negotiation, *Matthew Rabin* in behavioral economics, and *James Sebenius* in negotiations was instrumental in shaping research on human behavior and decision-making. Today, the research at Harvard Business School focuses on decision-making based on individual and interactive judgment and explores the role of personal bias, cognition and learning, time, perception, ethics and morality, and emotions (Source: <https://www.hbs.edu/faculty/topics/Pages/behavior.aspx>).

Bestselling books such as Dan Ariely’s (2010) - ‘Predictably Irrational - The Hidden Forces that Shape our Decisions’ and Daniel Kahneman’s (2012) - ‘Thinking, Fast and Slow’ have opened the world’s eyes to the quirky and error-prone ways in which people make important decisions. How small interventions in the environment or incentives can encourage people to make better decisions. His empirical findings challenge the assumption of human rationality prevailing in modern economic theory. Traditional economic theory posits that people make decisions by maximizing a utility function in which all of the relevant constraints and preferences are included and weighed appropriately. Behavioral economists and decision-making researchers, however, are interested in how people make decisions in the face of incomplete information, limited cognitive resources, and decision biases. Empirical findings in the areas of behavioral economics, judgment and decision making demonstrate departures from the notion that man is economically rational, illustrating instead that people often act in ways that are economically suboptimal (Knoll, M. A. Z., 2010).

Human behavior and decision-making is a featured research topic at Harvard Business School. There are significant evidences that consumer behavior and decision-making are heavily influenced by a wide range of human biases (Lunn, P. and Lyons, S., 2010). These biases are thought to be the product of the fact that people have two modes of thought—intuition (or fast thinking) and reasoning (or slow thinking) (Kahneman, D., 2012). While the use of intuition allows human beings of limited mental processing ability to make complicated decisions faster through the use of



heuristics, it can also lead them to make 'mistakes' that most people find difficult to identify (Kahneman, D., 2012). As such, if it is true that the exchange of precision for speed can be seen as a rational choice for a person with finite cognitive capacity, it also has the potential to turn the decisions made by individuals into an unreliable indicator of their preferences (Gigerenzer, G. and Brighton, H., 2009). Forward-thinking companies apply the principles of behavioral economics to shape the behavior of customers and employees. Behavioral economics provides fundamental insights into how people think and how changes in decision-making environment impact their choices. By capitalizing on these insights and understanding how to rigorously test the ideas for improving outcomes you can help your company successfully engage customers, increase employee

responsiveness, and gain a competitive advantage for the long term. The executives from mid-to-large size companies who lead and drive decisions for functional areas such as product development, human resources, talent management, advertising, marketing, business development, and sales find the application of behavioral economics in decision-making. It is also evident by individuals who oversee risk management, product design, or product management. Building on the insights of those scholars and many others in the field of behavioral economics, the researchers need to concentrate on how leaders can apply those ideas to influence the behavior of customers and employees. (Source: <https://www.exed.hbs.edu/programs/be/Pages/default.aspx>).

## Research G A P

On the basis of review of the literature, I have identified a lacuna in the mitigation of behavioral biases area. While several researchers aim to exploit these biases to help individual decision-makers make utility-enhancing decisions, very little thought has been given to educating individuals about their irrational and self-harming decisions and analysing if the education had any significant improvement in their decision-making abilities. This research intends to form a strong base to this new line of study. A few cumbersome case studies were posed to the private and public sector employees of the age group of 30-40 years. The aim of the research is to find out if there is any significant difference in behavioral biases exhibited by respondents belonging to public and private sector. Does their work experience in their public and private sector work environment reduce the biases in their decision-making architecture?

Even if the impact is temporary, it can have useful applications.

Investment management firms, investment banks, asset management companies, proprietary trading firms, other institutions in the field of finance and businesses in general can exploit the temporary return of sanity by conducting regular workshops and seminars on Behavioral Economics. It will also lead to reinforcement of such ideas and the need for such activities may reduce over time.

## Objectives of Study

The objective of conducting this empirical research is to study the decision architecture based on "Predictably Irrational - The Hidden Forces that Shape our Decisions".

The research focus primarily on incorporating psychologically more realistic assumptions into empirically applicable formal economic theory. The research includes the study of errors in statistical reasoning and the evolution of beliefs, effects of choice context on exhibited preferences, reference-dependent preferences, and errors people make in inference and learning settings. The decision architecture based on individual and interactive judgment is studied to explore the role of personal bias, cognition and learning, time, emotion, perception, ethics and morality.

## Significance of Study

Structured to broaden and deepen leaders' analytical and decision-making skills, a study on the application of the principles of behavioral economics across an organization's managerial functions need to be researched. The psychological foundations such as

**Table 1:** Factors of decision architecture

<i>Decision architecture</i>		
1.	Informational asymmetries	Ambiguity aversion Anecdotal evidence
2.	<i>Heuristics and biases</i>	<i>Rules of thumb</i> Status quo bias Default effects
3.	<i>Intertemporal choices</i>	<i>Self-control Procrastination</i> <i>Hyperbolic discounting</i> <i>Emotions</i>
4.	Decision context	Reference dependence Choice bracketing Framing effects Choice architecture

~Source: Knoll, M.A.Z. 2010

decision-making under risk and uncertainty, intertemporal choice, biases in judgment, psychological accounting, and social preferences are significant to be studied to formulate decision architecture. The decision architecture based on individual and interactive judgment need to be studied to explore the role of personal bias, cognition and learning, time, perception, ethics and morality, and emotion. The powerful and sometimes surprising ways that subtle change to the decision-making environment can influence the final decision. Therefore, it is significant to study the psychological and economic factors that drive individuals' decisions.

## RESEARCH METHODOLOGY

This empirical research study is underpinned by the interpretive paradigm. The central endeavor in the context of the interpretive paradigm is to understand the subjective world of decision making behavior. To retain the integrity of the phenomena being investigated, efforts are made to get inside the person and to understand from within (Cohen et al. 2011: 17).

The following research methodology is adopted for conducting this empirical research study:

### Decision Architecture

The objective of conducting this empirical research is to study the decision architecture based on "Predictably Irrational - The Hidden Forces that Shape our Decisions". The following factors of decision architecture (Knoll, M.A.Z. 2010) were studied:

### Research Hypotheses

The null and alternative hypotheses were developed to be tested while studying various factors of decision architecture given in Tables 1 and 2 as follows:

### Primary Data Collection

The primary data for conducting this empirical research study was collected with the help of questionnaire containing open-ended and closed-ended questions.

### Data Collection Instrument: Questionnaire

The questionnaire may be an intrusion into the life of the respondent, in terms of sharing the experience for research, in terms of time taken to complete the instrument, the level of sensitivity of the questions, or the possible invasion of privacy. Questionnaire respondents are not passive data providers for researchers; they are subjects not objects of research (Cohen et al. 2011: 377). The questionnaire is a widely

**Table 2: Research Hypotheses**

*To study the application of behavioral economics to decision architecture, the following null (H<sub>0</sub>) and alternative (H<sub>1</sub>) hypotheses are tested:*

- |                |   |
|----------------|---|
| H <sub>0</sub> | Decision Architects' rationality is often bounded by <i>information asymmetries, heuristics and cognitive limitations</i> .                         |
| H <sub>1</sub> | Decision Architects' rationality is not bounded by <i>information asymmetries, heuristics and cognitive limitations</i> . They are always rational. |

used and useful instrument for collecting data. The questionnaire provides descriptive, inferential and explanatory information and help in capturing the data from multiple choice, closed questions, test scores or observation schedules. Therefore, it helps in providing structured data and is often comparatively straightforward to analyze (Wilson and Mclean 1994:3).

Another development in the research methodology of behavioral economics is the use of gamification. It is generally observed that people may answer in a questionnaire in a particular way but when they act in a real time situation their response is radically different. If some online and offline games can be created to test these behavioral biases in a more interactive, engaging way, it can yield some very useful and insightful results that can be recorded in the form of data for conducting research.

### Questionnaire Preparation and Circulation

A questionnaire of 25 questions was drafted exclusively for conducting this empirical research study and electronically circulated among 100 mid-age (30-40 years) private and public sector employees, those who were in my direct and indirect contacts. They need to take lot of decisions in their personal and professional life. Thereafter, it was attempted by 65 respondents. Their responses were collected over a period of one month. During the process of data collection, several reminders were sent to get the data collected on time.

The questionnaire was aimed at gauging information regarding behavioral biases, informational asymmetries, heuristics and biases, intertemporal choices, decision context, rational ambivalence etc. in decision making by the private and public sector employees. The questionnaire tested the Allais Paradox, segregation of gains, integration of losses and sunk cost fallacy etc.

### Tabulation of Data

The responses collected from the respondents were assigned scores in the following manner: (1) On the





question of Allais Paradox, five points were given if the respondent's answer was consistent with expected Utility Theory. (2) On the question of Segregation of Gains, five points were given if the respondent chose among the options, indicating his / her rational ambivalence among the options; otherwise he was given 0.

(3) The question on integration of losses was discarded because of framing errors. The respondents identified another concept of TVM (time value of money) which was not anticipated. (4) On the question of Sunk Cost Fallacy, if the respondent declined to invest in both the projects he was given five points, otherwise 0. Finally, a composite score was calculated for each respondent to trace out the extent of leveraging behavioral economics to decision architecture.

### Results of Analysis and Interpretation

Being a researcher, I observed a great deal of heterogeneity in inter-bias mean differences. This shows that in some cases the private and public sector employees take

decisions in similar pattern, while in some circumstances, public sector employees lag far behind in making judicious decisions. In general, when the private and public sector employees were presented with a series of circumstances, private sector employees took decisions far better than the public sector. It also analysed and observed that the public sector employees are able to grasp some tricky problems but not all, which usually depends upon their previous similar experiences. This is widely unpredictable, unsystematic and random. On the other hand, public sector employees are placed much better to handle such complex and cumbersome situations that they will face in reality.

### CONCLUSION

The research found significant levels of difference in the decision making scores of private sector and public sector employees. Their work experience does lead to a systematic reduction in some biases and overall more rational behavior. Though decision architects' rationality is often bounded by information asymmetries, heuristics and cognitive limitations.

The findings of this empirical research study challenge the assumption of human rationality prevailing in modern economic theory. Traditional economic theory posits that people make decisions by maximizing a utility function in which all of the relevant constraints and preferences are included and weighed appropriately. Behavioral economists

and decision-making researchers, however, are interested in how people make decisions in the face of incomplete information, limited cognitive resources, and decision biases. Empirical findings in the areas of behavioral economics, judgment and decision making demonstrate departures from the notion that man is economically rational, illustrating instead that people often act in ways that are economically suboptimal (Knoll, M. A. Z., 2010).

There are several insights that corporates can glean from this study. If general Neoclassical Economics education leads to a significant improvement in decision-making capabilities, then the research findings on Behavioral Economics and Behavioral Finance can lead to drastic augmentation in the decision making skills of investment managers, top-level executives and practically every corporate manager.

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