Chapter 4
Decision-Making in Economics: Critical Lessons from Neurobiology

Renato Alas Martins
Bond University, Australia

Avik Mukherjee
Globsyn Business School, India

Kuldeep Kumar
Bond University, Australia

Munirul H. Nabin
Deakin University, Australia

Sukanto Bhattacharya
Deakin University, Australia

ABSTRACT

In this chapter, the authors consider some of the issues regarding the rational choice decision framework in neoclassical economics and how it can particularly be found wanting in the absence of due consideration for some of the underlying critical neurobiological factors which govern decision making. They develop a critical decision problem and explore the scenario where the solution predicted by formal economic theory may be in conflict with the decision that actually occurs. Such conflict is especially relevant in the context of economic decision making in emerging markets where there can be a lack of trust in the system by the agents operating within it. Based on logically consistent arguments derived from the extant literature, the authors argue that non-consideration of underlying neurobiological factors is a direct cause of this conflict.

INTRODUCTION

Economics is ultimately a decision science. However, "decision making" implies a broader bio-behavioural process encompassing passive as well as active functions bearing a range of cognitive complexity. When it comes to modelling the decision-making process, the approaches taken by neoclassical economists often completely ignore the biological basis underlying what can superficially appear as a mechanistic process which may be effectively 'de-linked' from the subliminal bio-behavioural factors.

'Rational choice' has formed the bedrock of neoclassical economic decision models for a substantial length of time. Although it somewhat fell out of favour for a while following the birth of the 'behavioural school', it has subsequently experienced a revival of sorts (Green & Shapiro,

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1996). Under the quintessential neoclassical economic decision model, an individual decision maker is an inexorable 'utility maximizer'. She is faced with a number of alternative courses of action which may be ranked in the order of her preferences. There is an inherent logic in such preference ordering such that if an alternative is preferred over another, then a third alternative which is preferred over the former will also be preferred over the latter so that any such ranking is objective, complete and transitive and in accordance with 'revealed preferences' (Kreps, 1990). Any preference ranking which has the properties of completeness and transitivity may be mathematically represented via a 'utility function' so long as the number of alternative choices is finite (Mas-Collel, Whinston, & Green, 1995).

Plotted graphically, such functions yield 'utility curves' that tend to have positives slopes at least up to a certain point. However, a utility curve typically starts dipping down after a certain point, reflecting the property of 'diminishing marginal utility' embedded within the governing utility function. In the presence of explicit restrictions under which a certain level of utility may be attained by the decision maker (e.g., budgetary limitations), a neoclassical economic decision problem is mostly seen to devolve to a constrained optimization problem, either deterministic or probabilistic (Alas et al, 2012).

The modelling of an economic decision problem as a mathematical optimization problem allows an objective treatment of the problem using well-established mathematical rules. However, the obtained result may then be seen to carry 'a stamp of infallibility' owing to it being derived via mathematical reasoning. While pure mathematical models have the obvious advantage of standing on and drawing from an established body of logically consistent principles, they are at best inadequate and at worst inappropriate in modelling decision making as a human act. The problem of over-reliance on optimality models to suit biological problems has been well-addressed by Rice (2012). To the extent that human decision making entails a distinctive bio-behavioural process which is contingent on the level of cognitive complexity needed by a specific decision problem, an absolute reliance on mathematical optimization methods is not recommended. Indeed, as Sassower (2010) has argued, instead of trying to continuously re-invent neoclassical economics with the objective of "force fitting" its constructs to the problem domains that essentially lie outside its scope, one may do better to be "flexible" with the constructs themselves.

Only in the last 30 years has the role of "irrationality" in human decision-making received attention due to the ground-breaking work of Kahneman and Tversky (1979) in which they postulated their prospect theory as a formal departure from the expected utility theoretic paradigm of rational choice. A few years later, Hershey, Kunreuther and Schoemaker (1982) observed that a choice between the same pair of certain and risky results was largely determined by whether the decision was represented as a "gamble" when the individuals displayed risk-seeking behaviour, or as an "insurance" when they suddenly became risk averse.

The next two decades were clearly dominated by the behaviourists and behavioural economics gained a strong foothold within the academic ramparts as a sub-field of both economic as well as the behavioural sciences. Although Schultz (2008) has criticized prospect theory by claiming that it lacks a coherent framework, Kahneman and Tversky's work has to be credited with having opened the proverbial "Pandora's Box" by firmly establishing behavioural economics as a recognized discipline. Loewenstein, Rick and Cohen (2008) have argued that human beings are inherently "fallible creatures" and not the perfect maximizers of utility as assumed by the neoclassical utility theory. Therefore, any such study of economic decision-making as a subset of overall human behaviour should borrow extensively from the discipline of psychology which recognizes and explores human fallibility.