Hedonic Utility, Loss Aversion and Moral Hazard

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Hedonic Utility, Loss Aversion and Moral Hazard

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Abstract

This paper reviews recent advances in the modelling of hedonic utility and the measurement of its physiological correlates. The paper also argues that incorporating hedonic experiences can enrich economic models. An example of such an application — a principal–agent model with moral hazard — is presented and thoroughly analyzed. Its implications are then compared with the structure of incentive contracts observed in practice.

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1

Introduction

In the late nineteenth century, Francis Y. Edgeworth argued that advances in "physio-psychology" would soon allow economists to provide a firm physiological basis for utility theory. This would be done through objectively measuring hedonic experiences via an apparatus he called a "hedonimeter." These advances, however, did not come fast enough and economists abandoned the study of hedonic utility for the greater part of the twentieth century.[1] Recently, there has been a resurgence of interest in hedonic utility, partly due to the inability of revealed preference theory to account for certain observable behaviors and partly as a result of substantial advances in brain-imaging technology. These advances have allowed us to glimpse at what one day may well become Edgeworth's "hedonimeter."

In this paper, I try to summarize these recent advances in the modelling and measurement of hedonic utility. I then argue that

[1] Collander (2007) provides a nice historical overview of Edgeworth's controbutions to the debates surrounding hedonic utility in the late nineteenth and early twentieth centuries. For a more general analysis of the historical interaction between the biological and economic sciences leading to the conclusion that economics is an evolutionary science, see Zak and Denzau (2001).

economists can use these studies to improve their understanding of economic phenomena. I illustrate this by analyzing a familiar economic model — the principal–agent relationship with moral hazard — in which the properties of hedonic utility make a difference in how incentives are provided.

The study of hedonic utility is interdisciplinary in nature since many useful contributions have been made by papers in areas other than economics. Specifically, there is converging evidence from evolutionary theory, experimental psychology, and neuroscience that hedonic utility is an important determinant of actual behavior. It appears that the hedonic experience associated with an outcome is substantially influenced by how the outcome compares to a baseline, reference level. This reference outcome is not fixed, but adapts to the circumstances and is influenced by the expected value under the present environment. In addition, the process of evaluating gains and losses relative to the reference outcome appears to be correlated with activations in partly separable neural systems that are governed by different neurotransmitters. The magnitude of the neurochemical response appears to be a concave function of the magnitude of the deviation (gain or loss) from the reference outcome. These results are consistent with behavioral evidence gathered by experimental psychologists and behavioral economists, who for a long time have claimed that certain properties of experimentally-motivated utility functions, such as reference dependence, loss aversion, and diminishing sensitivity, have non-trivial influence on actual choices.

I argue that economic analysis can benefit from incorporating such new results on hedonic utility. I illustrate this claim by analyzing a familiar economic model — the principal–agent relationship with moral hazard — where the properties of the utility function influence the way in which incentives are provided. The idea is that a profit-maximizing principal will design the incentive contract by taking into account the hedonic experiences of the agent. As a result, the optimal contract pays attention to all properties of hedonic utility. The modal transfer is exactly at the reference outcome, the value expected on average by the agent. The diminishing, but non-zero, enjoyment of extra rewards is exploited by giving an additional bonus that increases with the level of output. On the other hand, the occurrence of negative emotions due to

losses is minimized by imposing only the biggest possible punishment in states where output is very low.

Finally, I analyze several extensions of the basic model — competition among principals, aggregate uncertainty, and dynamics — and discuss how their implications relate to the structure of incentive contracts observed in practice. For instance, the presence of hedonic utility implies no response of the modal transfer with respect to the aggregate state of nature but an increase in the probability of the biggest punishment being implemented. In addition, by incorporating future expected outcomes in current hedonic experience, hedonic utility allows for the possibility that stationary contracts may be optimal even if the actual behavior of the agent exhibits deviations from risk neutrality.

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