Modeling Impatience: a new extended CADI and CRDI setting

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Abstract

Literature on time discounting can be condensed into two main paradigms: the exponential [1] and the hyperbolic discounting [2]. The latter, however, does not allow enough flexibility in its application, since there is no room for increasing impatience or strong decreasing impatience in ordinary hyperbolic models.

Academics developed more sophisticated models able to embed increasing impatience as well, but most of them neglected to analyze how individuals perceive time. Moreover, a little has been said about how time discounting is both related to time and time subjective perception.

An exception is the sub-additive discounting: it shows that discounting over a delay is greater when the delay is divided into sub-intervals than when it is not. Another interesting perspective is developed within the framework of the Discounting by Intervals model [4], whereby the discount rate is a function of both how far outcomes are from the present and how far the outcomes are removed from one another.

An alternative way to overcome the limited flexibility of the hyperbolic discounting is by means of equipping the discount function with a suitable degree of decreasing impatience.

We present here a family of new discount functions, of which we derive a formal axiomatization, that can accommodate absolute and relative decreasing impatience. Applying the framework proposed by Bleichrodt et al. [3], we further extend their formulation of CADI and CRDI functions. In our analysis we treat discounting as a function not only of time but, simultaneously, also of time interval, making discounting actually a two-variable function.

References

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