The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

Optimal Equilibria for Time-inconsistency -- the Stopping Case

by

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Abstract

For time-inconsistent control/stopping problems, it is known that one should employ an equilibrium strategy, formulated in an intertemporal game between current and future selves. Such strategies, however, are not unique. This gives rise to two unsettled problems: (i) How do we find all equilibria? (ii) Among all equilibria, how do we select the appropriate one to use? For stopping problems under non-exponential discounting, we develop a new method, called the iterative approach, to resolve both (i) and (ii). First, we formulate equilibria as fixed points of an operator, which represents strategic reasoning that takes into account future selves' behavior. Under appropriate regularity conditions, every equilibrium can be found through a fixed-point iteration. When the state process is one-dimensional, we further establish the existence of an optimal equilibrium, which generates larger values than any other equilibrium does at all times. To the best of our knowledge, this is the first time a dominating subgame perfect Nash equilibrium is shown to exist in the literature of time-inconsistency. Our theory is illustrated explicitly in several real options models.

Date : 21 May, 2018 (Monday)
Time : 5:00p.m. – 6:00p.m.
Venue : TU801, The Hong Kong Polytechnic University

*** * * ALL ARE WELCOME * ***