

Cost-efficient Payoffs under Model Ambiguity

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Abstract

Dybvig (1988a,b) solves in a complete market setting the problem of finding a payoff that is cheapest possible in reaching a given target distribution (“cost-efficient payoff”). In the presence of ambiguity, the distribution of a payoff is, however, no longer known with certainty. We study the problem of finding the cheapest possible payoff whose worst-case distribution stochastically dominates a given target distribution (“robust cost-efficient payoff”) and determine solutions under certain conditions. We study the link between “robust cost-efficiency” and the maxmin expected utility setting of Gilboa and Schmeidler, as well as

more generally with robust preferences in a possibly non-expected utility setting. Specifically,

we show that solutions to maxmin robust expected utility are necessarily robust cost-efficient.

We illustrate our study with examples involving uncertainty both on the drift and on the volatility of the risky asset.

KEYWORDS: Cost-efficient payoffs, model ambiguity, maxmin utility, robust preferences, drift and volatility uncertainty

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