

The Design of Ambiguous Mechanisms

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ABSTRACT

This paper considers a mechanism design framework that is standard except for the agents' preferences, which exhibit ambiguity aversion in the sense of Gilboa and Schmeidler (1989). We show that in this framework the optimal strategic form mechanism is an ambiguous mechanism. An ambiguous mechanism specifies a message space and a set of outcome functions. After showing that (a version of) the Revelation Principle holds in our environment, we give an exact characterization of the (smallest) optimal ambiguous mechanism for the single agent case. If the type set is composed of N (finite) elements, then the (smallest) optimal ambiguous mechanism contains $N - 1$ outcome functions. We show how the extra revenue that the designer obtains by employing an ambiguous mechanism (as opposed to a standard non-ambiguous mechanism) depends on the parameters of the model. In particular, we prove that the share of the surplus that the designer can extract from the agent increases as the type set becomes larger and the probability of each single type decreases. In the limiting case where the agent's type is drawn from a nonatomic distribution on an interval, the optimal ambiguous mechanism extracts all the rent from the agent.