

# ORDERING AMBIGUOUS ACTS

By

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We define and characterise when one act is "more ambiguous than" another, analogous to notions of "more risky than". Our characterizations are calibrated to a definition based on preferences in the sense that an increase in ambiguity makes ambiguity averse decision makers worse off. More precisely, we define, for preferences on Savage acts, a notion of "more ambiguous" and a notion of "purely more ambiguous" as natural "duals" to notions of comparative and absolute ambiguity aversion, respectively. We apply the definitions to the framework of smooth ambiguity preferences formulated in Klibanoff, Marinacci, Mukerji (2005) and to that of  $\alpha$ -Maxmin expected utility preferences (Hurwicz (1959), Ghirardato, Marinacci and Macheroni (2004)) to obtain characterizations in terms of model parameters so that it is possible to phrase the relevant comparative static questions in analytically appropriate and tractable ways. One key characterization shows that when the set of possible probabilities is ordered similarly across a class of utility functions, then ambiguity has a convenient and natural representation in terms of the copulae of joint distributions associated with the acts. This may be interpreted as saying, the more ambiguous an act the more informative are its outcomes of the "true" probability distribution over the states. This intriguing connection between the ambiguous nature of an act and what its outcomes reveal about the "true" probability emerges as a feature that is shared quite generally by our other characterizations. We also explore the comparative statics of ambiguity in the standard portfolio problem with one sure and one uncertain asset and show that, in general, the comparative statics are not predictable, just as they are not with increases in pure risk. However, if the change in ambiguity satisfies the conditions yielding the key characterization, the "expected" comparative statics property holds when the decision maker's preferences satisfy a certain supermodularity condition.