

## **Appendix A: Stochastic dominance**

When making decisions, decision makers respond to the available information according to their own risk attitude (or the risk attitude of the organization they represent). This means that different decision makers can respond differently to the same predictions, depending on whether they are risk-averse, risk-neutral or risk-seeking. Information about risk attitude is therefore important to assess rational strategies, but even in the absence of knowledge around the risk attitude of the decision makers, it is possible to gain insights into how important risk attitude will be to the decision using a method called ‘stochastic dominance’ (Howard 1966; Levy 1998; see Canessa et al., 2016 for a conservation example).

Stochastic dominance can be determined by either comparing the cumulative probability distribution of each alternative or comparing the excess probability distribution (i.e., the complementary cumulative distribution). The cumulative probability distributions and the excess probability distributions convey the same information but require an inverse interpretation. The cumulative distribution plots the probability that a metric is less than or equal to the corresponding value on the x-axis. The excess probability distribution plots the probability that a metric is greater than the corresponding value on the x axis. For objective metrics that we seek to maximize, alternatives with smaller cumulative probabilities (or larger excess probabilities) for a given value on the x-axis are preferred as they represent a better chance of the objective metric being higher than the specified value. Alternatives with cumulative probabilities that are smaller than or equal to that of another alternative for every value on the x-axis, which is the same as alternatives with excess probabilities that are larger than that of another alternative for every value on the x-axis, are first-order stochastically dominant to the compared alternatives.

Graphically, this first-order dominance is indicated by the fact that the lines of the probability distributions, cumulative or excess, do not cross (see Figure 7 in main text). In other words, the dominant action would be the rational choice regardless of the decision maker's risk attitude. Additional orders of dominance can be determined if needed, each requiring additional assumptions, but these extra steps were not required in our study.

Although the cumulative and excess probability distributions provide the same information, the excess probability distributions may be a better communication tool than cumulative distributions (Howard and Abbas 2015). Indeed, we found the excess probability distributions were more intuitive for our purposes. Therefore, we used excess probability distributions to plot our results.

#### Literature Cited

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