Solutions to Some Extra Exercises for

"*Wakker (2010) Prospect Theory: for Risk and Ambiguity*"

The homework involves two extra exercises, not in the book but in the file extra_exercises_assignments.pdf. Those are Exercises 2.3.3 and 9.5.3, both conceptually important. This file gives solutions. There are also extra assignments, but for assignments no solutions are provided.

EXERCISE 2.3.3.

a) (1/3:100, 2/3:0) in all three cases.

b) The three state-contingent prospects all induce the same probability distribution over outcome and, by Assumption 2.1.2, are equivalent. Note that you cannot claim that indifference follows from identical expected values at this stage. The prospects have identical *objective* expected values using the objective p_j´s, but no-one said that such expected values are maximized by preferences. Preferences maximize subjective expected values based on the p_js.

c) The prospects in part b) have the same SEV. Hence, $p_1100 = p_2100 = p_3100$, so that $p_1 = p_2 = p_3$. These probabilities must all be 1/3.

d) They are the same.

e) The prospects $100_{s_j}0$ are all indifferent, implying that all values p_j100 are the same. Hence, all p_j are 1/n. Subjective and objective probabilities are identical.

f) Assumption 2.1.2, on decision under risk, alone already implies the equivalences under part b. It is natural to speculate that under most decision models using subjective probabilities, the three events must then have the same subjective probabilities also.—This holds under general models that satisfy Machina & Schmeidler's (1992) probabilistic sophistication, which assumes a sort of subjective stochastic dominance condition that is very plausible.—Then the rest of the exercise follows.

FURTHER COMMENT. If objective probabilities are available, then subjective probabilities usually have to agree with objective ones. For instance, if we have sufficient richness to have a uniform partition $\{E_1,\ldots,E_n\}$ with $P(E_j) = 1/n$ for all j, then all events with objective probability j/n have the same subjective probability j/n (being the same as of $E_1 \cup \cdots \cup E_j$). By monotonicity, the difference between objective and subjective probabilities then can never exceed 1/n.

This exercise provides an alternative way to show what Example 2.3.2, Exercise 2.3.1, and the para following it also show. □

EXERCISE 9.5.3. The attitude described is part of intrinsic utility and not of loss aversion, and it is rational. Utility concerns final wealth, and need not be affected by changes in frame or perceived reference point. If we were to change the perceived reference point, there will be a kink of utility not at the newly perceived reference point, but at the final wealth level corresponding with what is the reference point right now. □