APPENDIX 2. Details for Two Health-Care Lotteries Example

Consider the following hypothetical scenario:[38]

- Lottery A: {0.5, (pain-free, 10 years); 0.5, (pain, 1 year)}
- An unwitting analyst who uses the additive MCDA model, Eq. (5), to calculate the lottery payoffs:

$$U_{add}(\text{pain-free}, 10 \text{ years}) = k u_H(\text{pain-free}) + (1.0 - k) u_T(10 \text{ years})$$
$$U_{add}(\text{pain}, 1 \text{ year}) = k u_H(\text{pain}) + (1 - k) u_T(1 \text{ year}).$$

In accordance with vNM EUT,

$$\text{EU}\big(\text{Lottery A}\big)$$
$$= 0.5 \times k \times \big(u_H(\text{pain-free}) + u_H(\text{pain})\big) + 0.5 \times (1.0 - k) \times \big(u_T(10 \text{ years}) + u_T(1 \text{ year})\big).$$

A similar calculation for Lottery B yields EU(Lottery B) = EU(Lottery A).