Compensating & Equivalent Variations, Substitution & Income Effects

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Suppose a consumer has preferences of the form $U(x, y) = x^{0.5}y^{0.5}$. The price of good y is 1 and the price of good x changes from 1 to 2. The consumer has income $m = 8$. Assuming the consumer is utility maximizing, calculate the Compensating Variation and Equivalent Variation of the price change. Finally, decompose the total change in demand for good X into a substitution effect and an income effect.

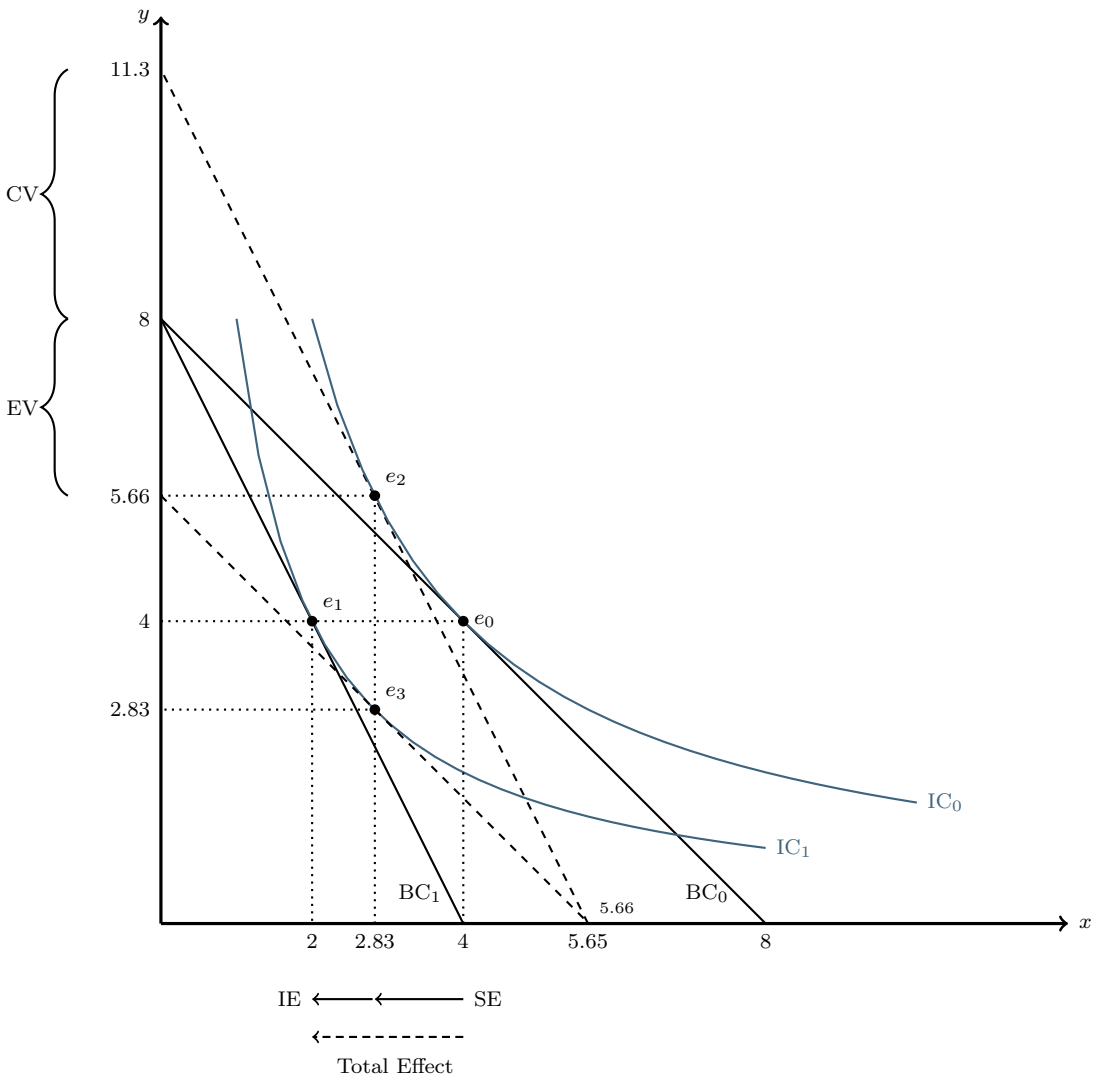

Figure 1: Compensating Variation (CV), Equivalent Variation (EV), Substitution Effect (SE), Income Effect (IE)

e_0: initial equilibrium
e_1: final equilibrium (after price of x increases)
e_2: CV adjustment
e_e: EV adjustment