Income & Substitution Effects: Slutsky versus Hicks

Suppose U=xy, B=$6, and Px=Py=$1. Then, The price of y increases to $2. The Marshallian (Walrasian) demands are

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$$x = \frac{B}{2P_x} \quad y = \frac{B}{2P_y}$$

a) Determine the Hicks income/substitution effect.

b) Determine the Slutsky income/substitution effect.

c) Determine the Compensating and Equivalent Variation

1) Solve original utility maximization problem, determine x, y, U. Px=$1,Py=$1

2) Solve final utility maximization problem, determine x, y, U. Px=$1,Py=$2.

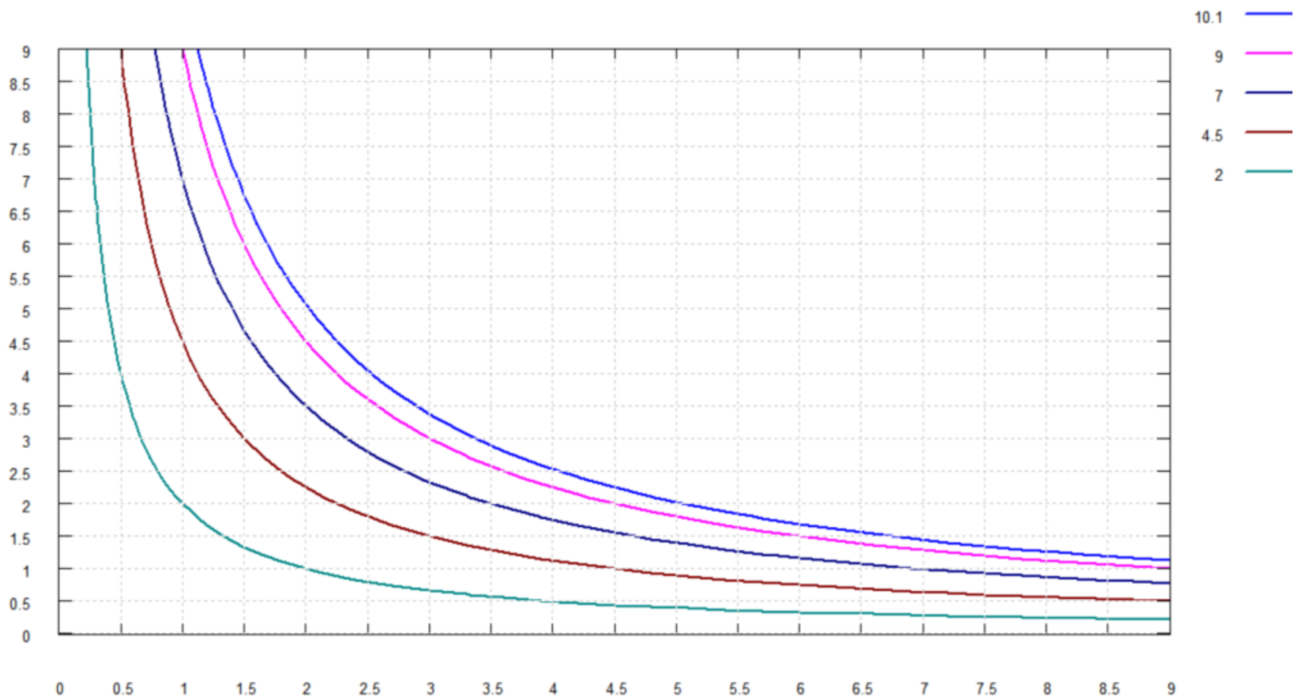
3) For Slutsky Decomposition: Find Budget: How much would it cost to buy OLD BASKET at NEW PRICES?
    a. Simply calculate budget, then optimize utility given budget, new prices.
    b. What would this person buy with new budget that **literally** removes the income effect?

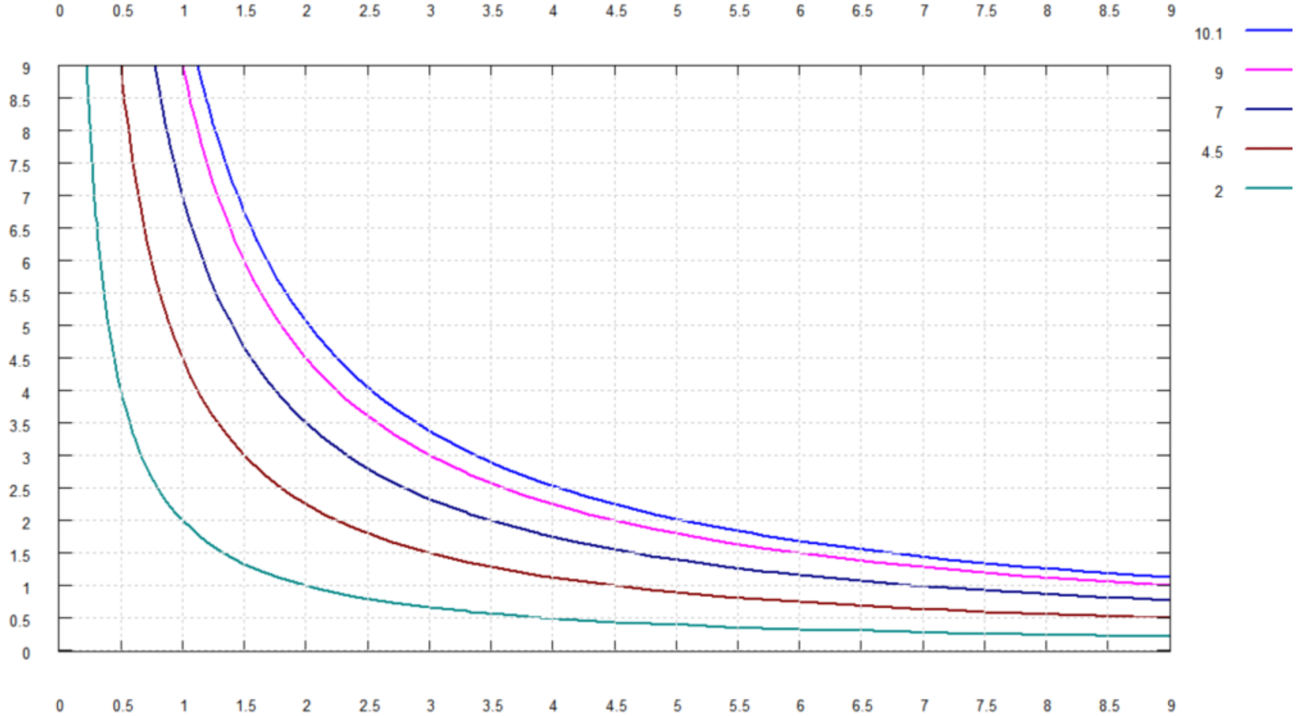
4) For Hicks Decomposition: How much would it cost to get the person back to the OLD utility at the NEW prices (in the cheapest way)
    a. Optimization problem: Old utility, new prices
    b. What would this person buy with budget that **removes the pain** of the price change?

5) Compensating Variation: Minimum Δ in income to get back to old U, new P.
    Logic: Compensate person for change in utility, Willingness To Accept (WTA)

6) Equivalent Variation: Minimum Δ in income to get person to new U, old P.
    Logic: What loss of income causes equivalent pain as price change, Willingness To Pay (WTP)

7) GROSS Substitutes/Complements: Look at income + substitution (total) effect
8) NET Substitutes/Complements: Look only at substitution effect (with only 2 goods, diminishing MRS implies must be net substitutes)





Price indices: Laspeyres vs. Paasche

Laspeyres: $\dfrac{\text{Cost to buy old Q at new P}}{\text{Cost to buy old Q at old P}}$

Paasche: $\dfrac{\text{Cost to buy new Q at new P}}{\text{Cost to buy new Q at old P}}$

Old Q: $x=3$ $y=3$
Old P: $P_x=\$1$ $P_y=\$1$

New Q: $x=3$ $y=1.5$
New P: $P_x=\$1$ $P_y=\$2$