Compensating and Equivalent Variation

Part of SH Econ Core

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last reviewed: December 27, 2020

Disclaimer

This slide deck is part of the SH Econ Core distribution.

See the Math Refresher for a quick review of algebra and calculus.

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Graphics: PSTricks

Report errors by email to the author

Prerequisites

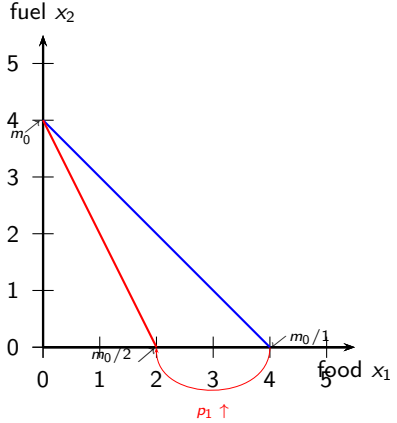
- required: $\rightarrow$ utility maximization
- required: $\rightarrow$ income and substitution effects

Supporting the Poor while Being Thrifty

Q? How do we compensate for price changes?

EX Jake consumes fuel and food, his income m is a benefit from the municipality (mayor Tom). He's at the poverty line m_0. Fuel costs $p_2 = 1$ (always). Utility is $u(x_1, x_2) = \sqrt{x_1 \cdot x_2}$.

- Food prices p_1 rise from 1 to 2.



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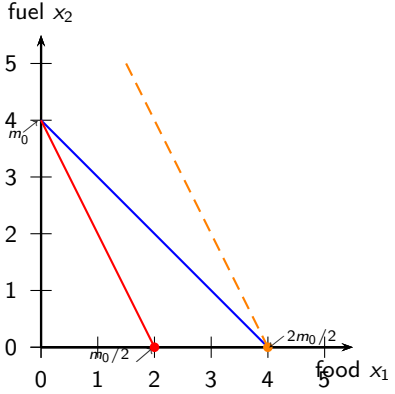

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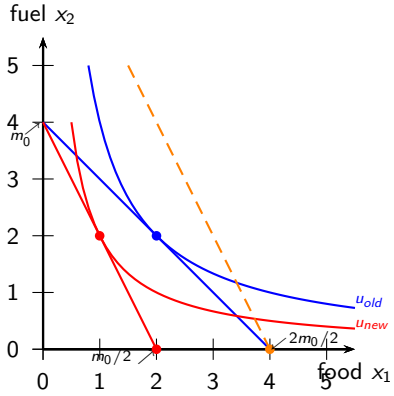

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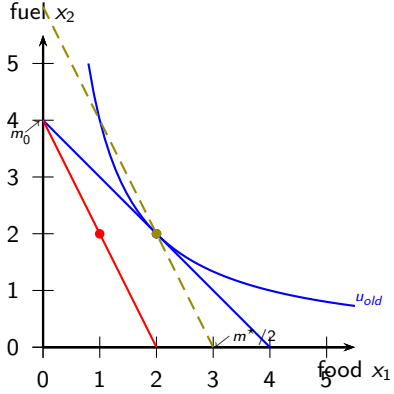
- ☐ Jake: "I can only buy half as much food, double my m!"
- ☐ Tom: "far too expensive, you actually also consume fuel, you don't need a doubling!"
- ☐ Jake: "then, gimme $m^\star$ so I can buy my old bundle!"



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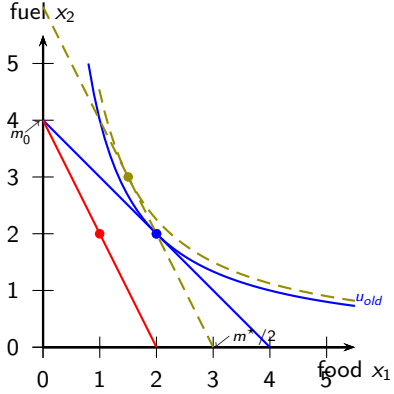

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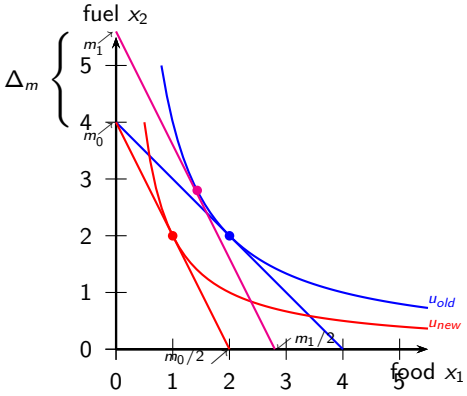
- Food prices p_1 rise from 1 to 2.
- Jake: "I can only buy half as much food, double my m!"
- Tom: "far too expensive, you actually also consume fuel, you don't need a doubling!"
- Jake: "then, gimme m^* so I can buy my old bundle!"
- Tom: "you'd still be better off, as you'd substitute away from food under the new prices"
- Tom: "we can give you m_1 to restore your utility"



Compensating Variation

- The difference $\Delta_m = m_0 - m_1$ is a measure of welfare change: as $\Delta_m < 0$, welfare (utility level) drops, unless compensated; hence the name: compensating variation (CV).
- CV refers to the amount of additional money an agent would need to reach their initial utility after a change in prices. Thus, CV reflects new prices and the old utility level.
- alternatively, CV measures the transfer the govt has to give to the consumer in order to let him reach his old utility when facing new prices
- so, it is a minimally necessary compensation to restore utility
- it is essentially a measure of welfare change expressed in money terms, suitable to undo the income effect of the price change

Equivalent Variation

The equivalent variation (EV) is a concept closely related to the CV. The difference is that the EV does not restore the old level of utility at after-change prices but it uses before-change prices to determine the after-change level of utility.