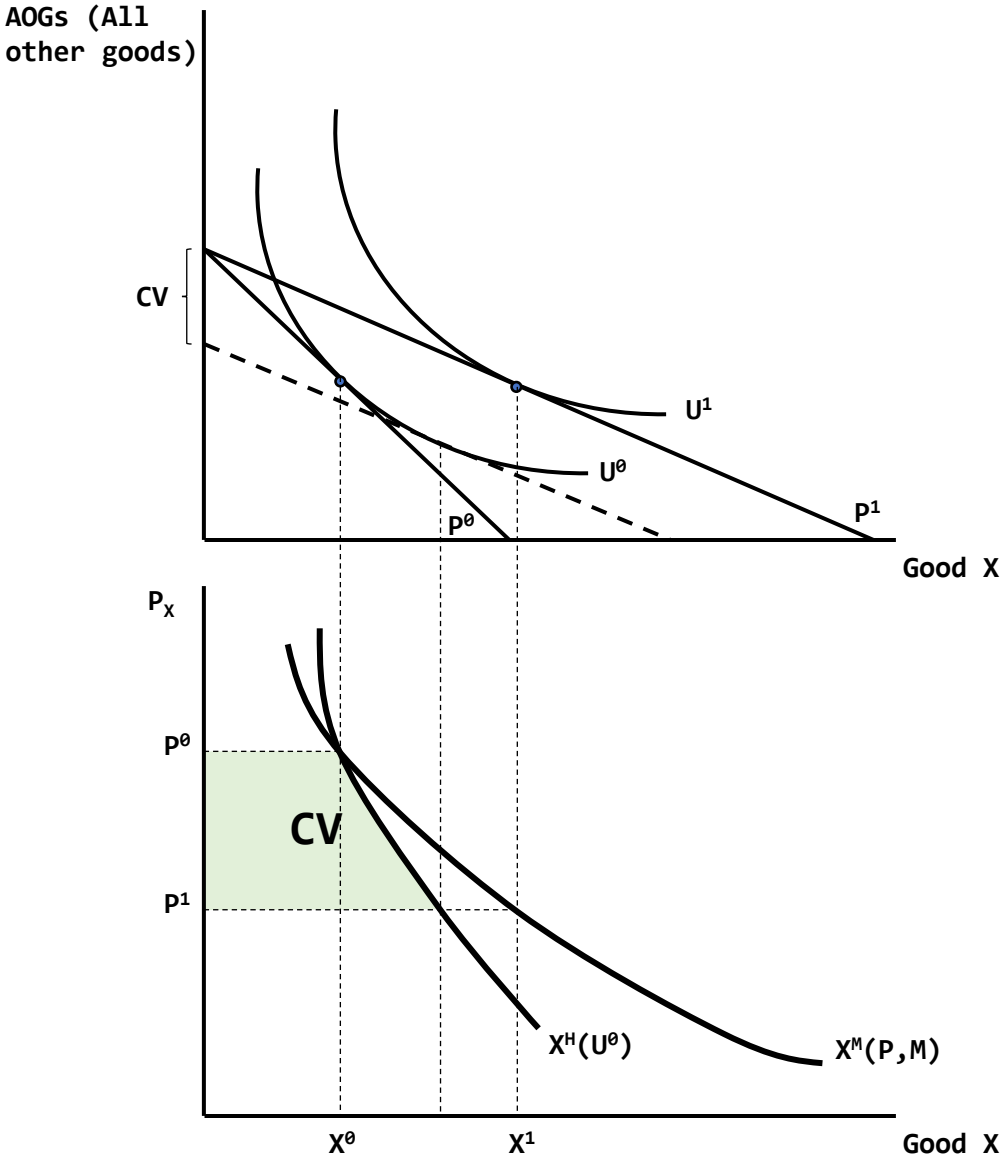
Compensating Variation
Price goes down

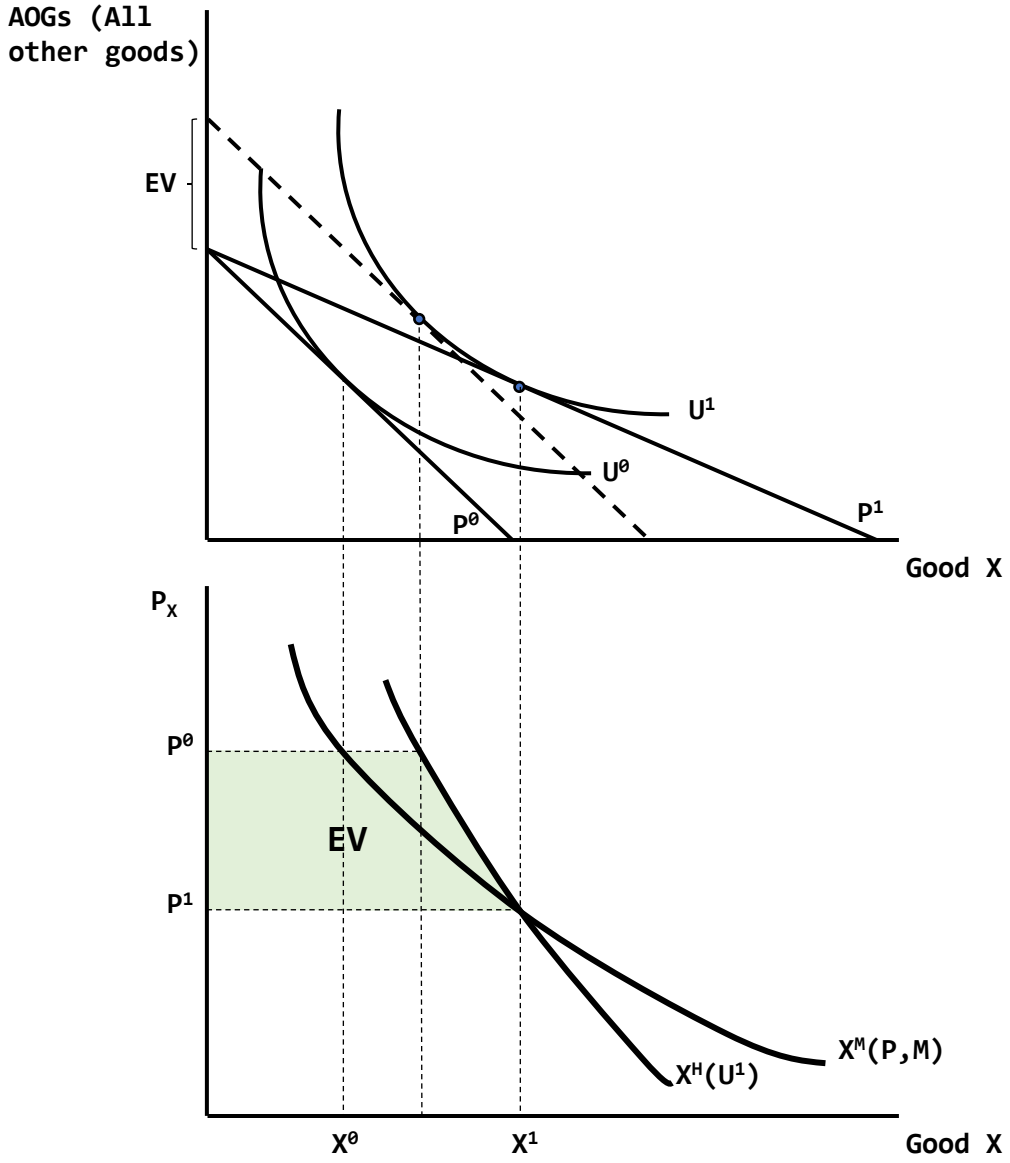


$$CV = C(U^0, P^0) - C(U^0, P^1)$$

$$= \int_{P^0}^{P^1} \frac{\partial C(\boldsymbol{P}, U^0)}{\partial P}\, dP$$

$$= \int_{P^0}^{P^1} X^H(\boldsymbol{P}, U^0)\, dP$$

Equivalent Variation
Price goes down



$$EV = C(U^1, P^0) - C(U^1, P^1)$$

$$= \int_{P^0}^{P^1} \frac{\partial C(\boldsymbol{P}, U^1)}{\partial P}\, dP$$

$$= \int_{P^0}^{P^1} X^H(\boldsymbol{P}, U^1)\, dP$$

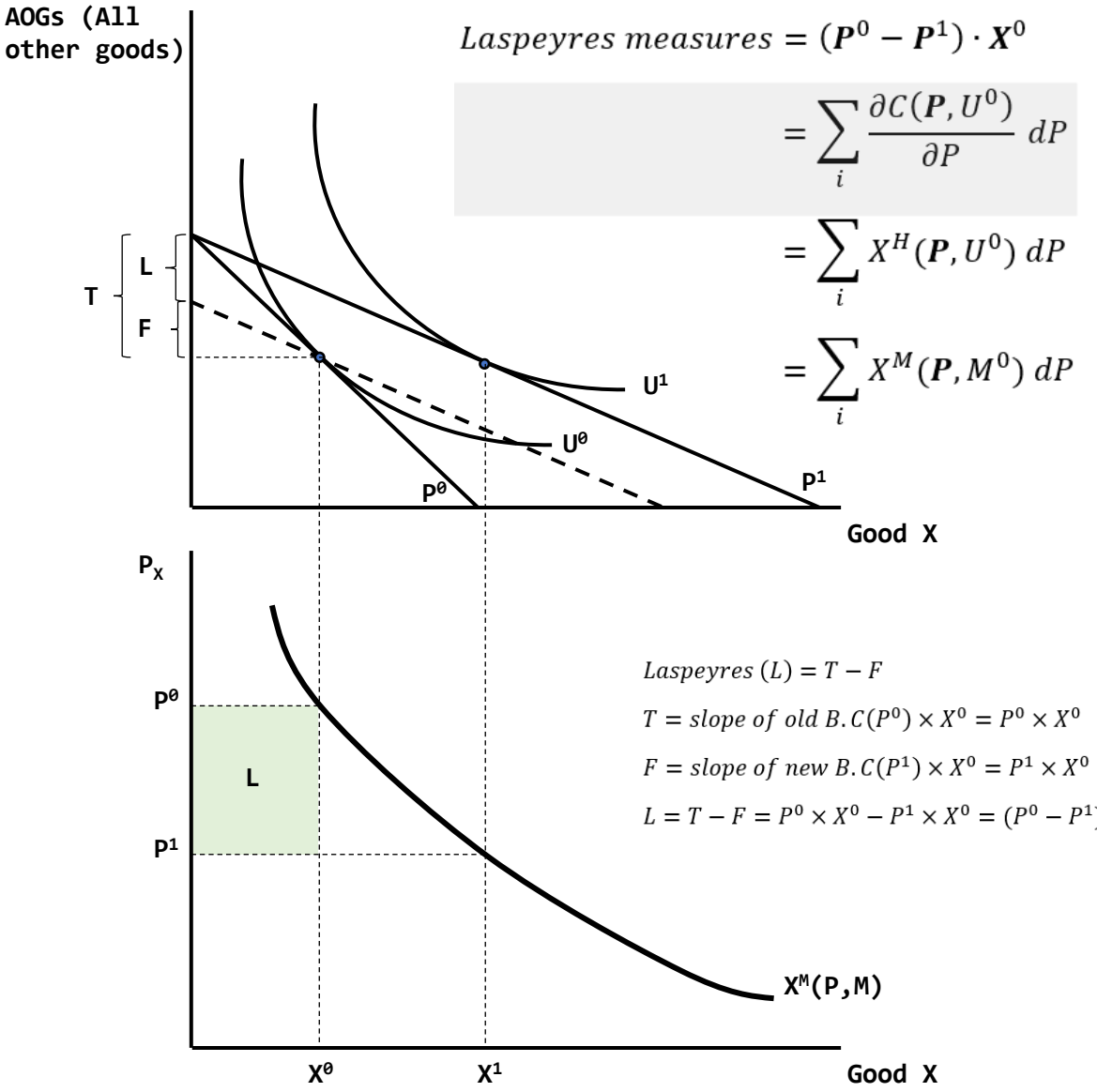
Laspeyres Measures
Price goes down

$$Laspeyres\ measures = (\boldsymbol{P}^0 - \boldsymbol{P}^1) \cdot \boldsymbol{X}^0$$

$$= \sum_i \frac{\partial C(\boldsymbol{P}, U^0)}{\partial P}\, dP$$

$$= \sum_i X^H(\boldsymbol{P}, U^0)\, dP$$

$$= \sum_i X^M(\boldsymbol{P}, M^0)\, dP$$



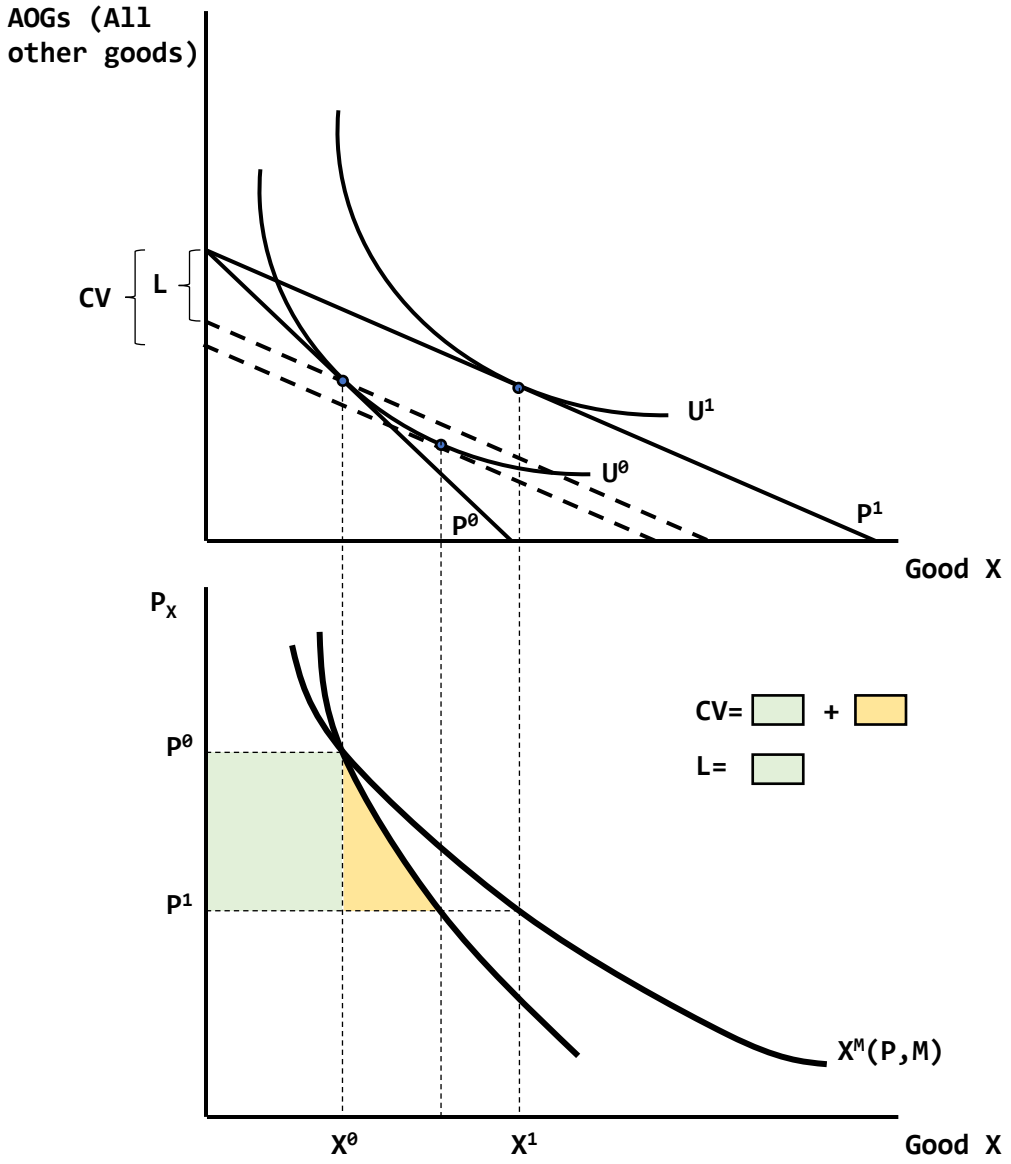
$$Laspeyres\ (L) = T - F$$

$$T = slope\ of\ old\ B.C(P^0) \times X^0 = P^0 \times X^0$$

$$F = slope\ of\ new\ B.C(P^1) \times X^0 = P^1 \times X^0$$

$$L = T - F = P^0 \times X^0 - P^1 \times X^0 = (P^0 - P^1) \times X^0$$

Laspeyres Measures VS Compensating Variation
Price goes down



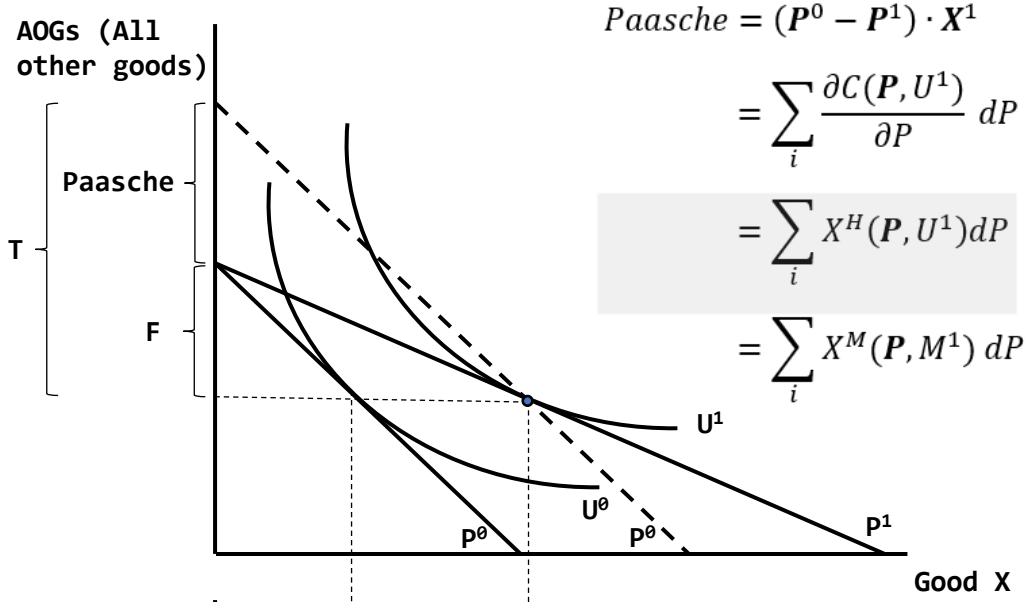
Paasche Measures
Price goes down

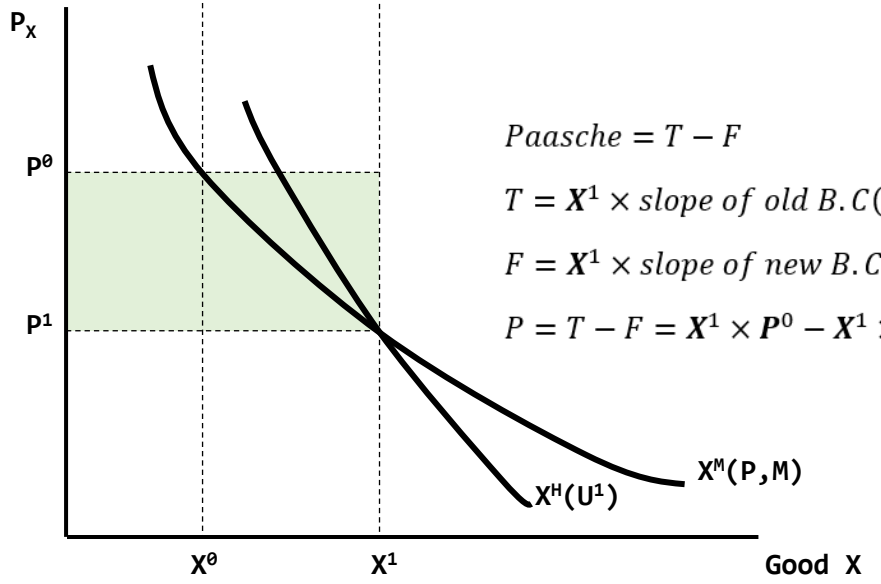
$$Paasche = (\boldsymbol{P}^0 - \boldsymbol{P}^1) \cdot \boldsymbol{X}^1$$

$$= \sum_i \frac{\partial C(\boldsymbol{P}, U^1)}{\partial P}\, dP$$

$$= \sum_i X^H(\boldsymbol{P}, U^1) dP$$

$$= \sum_i X^M(\boldsymbol{P}, M^1)\, dP$$





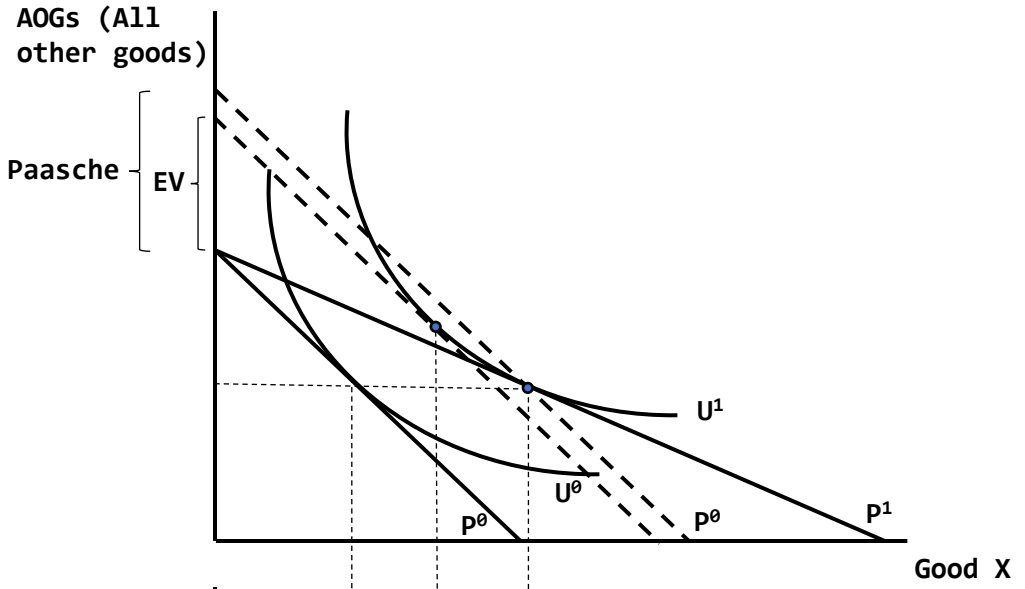
$$Paasche = T - F$$

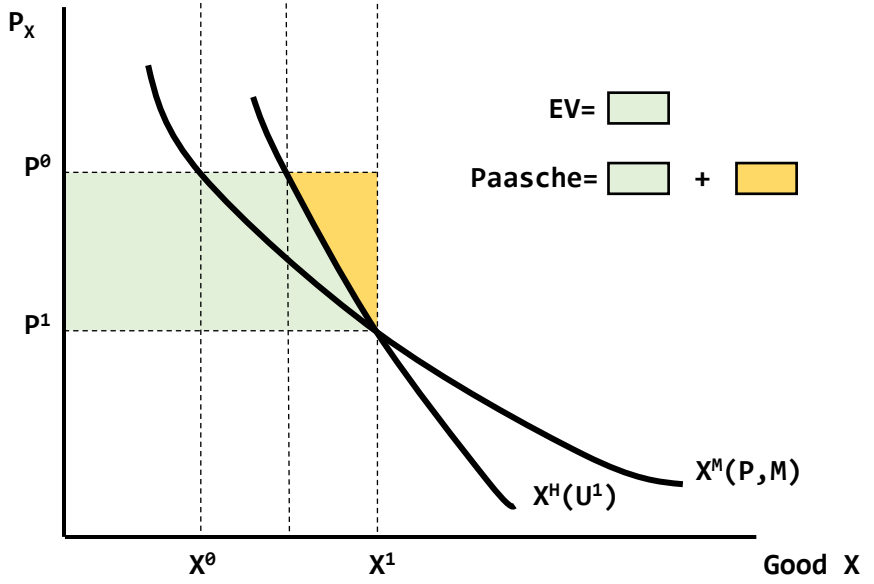
$$T = \boldsymbol{X}^1 \times slope\ of\ old\ B.C(\boldsymbol{P}^0)$$

$$F = \boldsymbol{X}^1 \times slope\ of\ new\ B.C(\boldsymbol{P}^1)$$

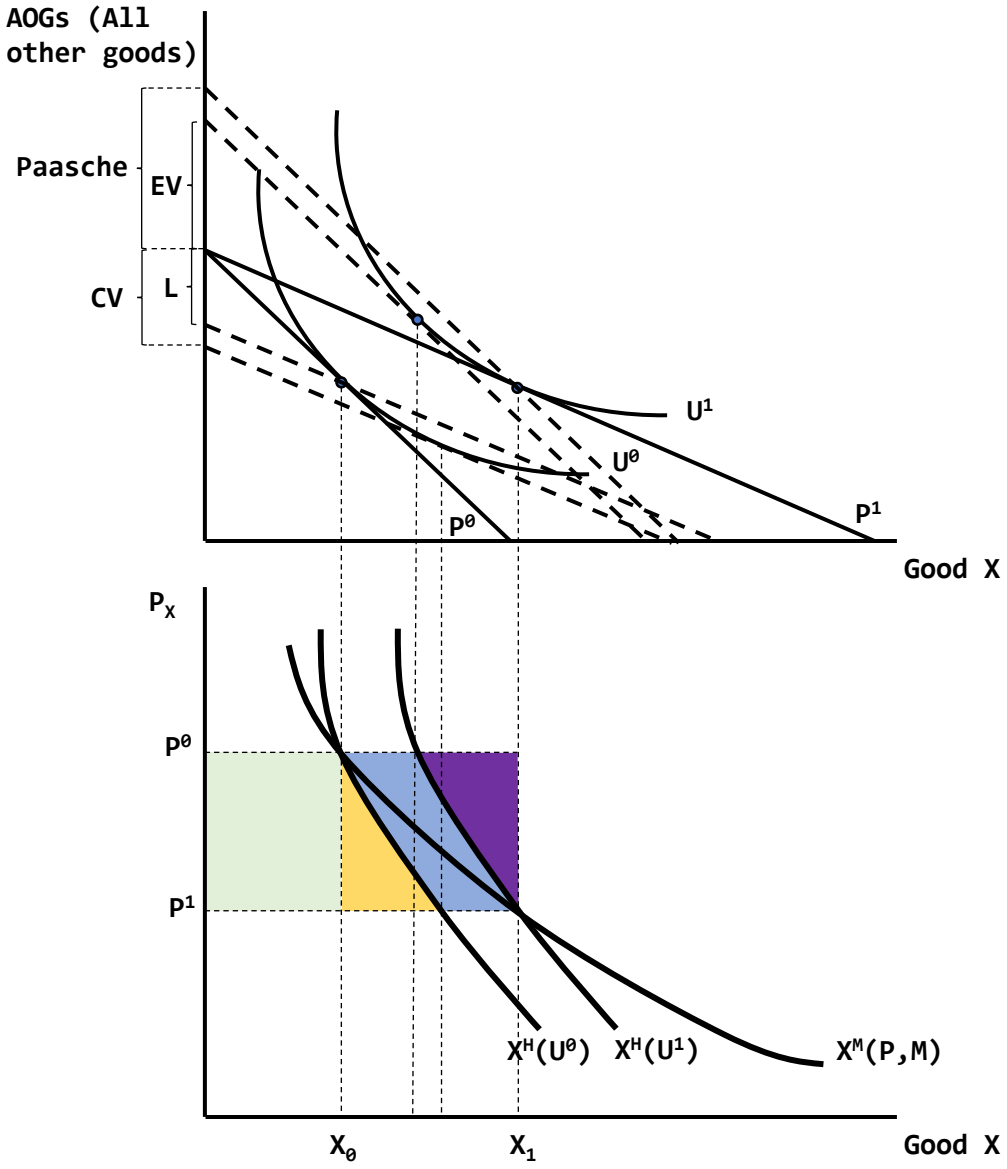
$$P = T - F = \boldsymbol{X}^1 \times \boldsymbol{P}^0 - \boldsymbol{X}^1 \times \boldsymbol{P}^1 = (\boldsymbol{P}^0 - \boldsymbol{P}^1) \cdot \boldsymbol{X}^1$$

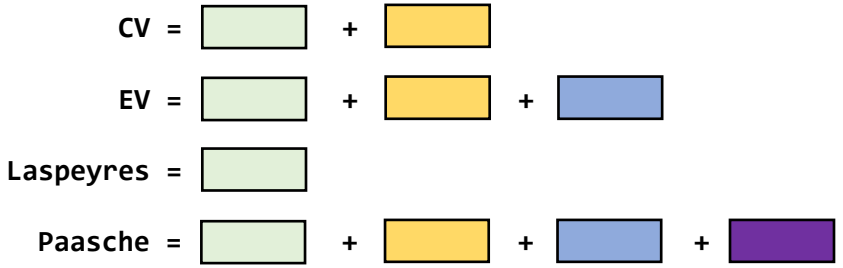
Paasche Measures VS Equivalent Variation
Price goes down



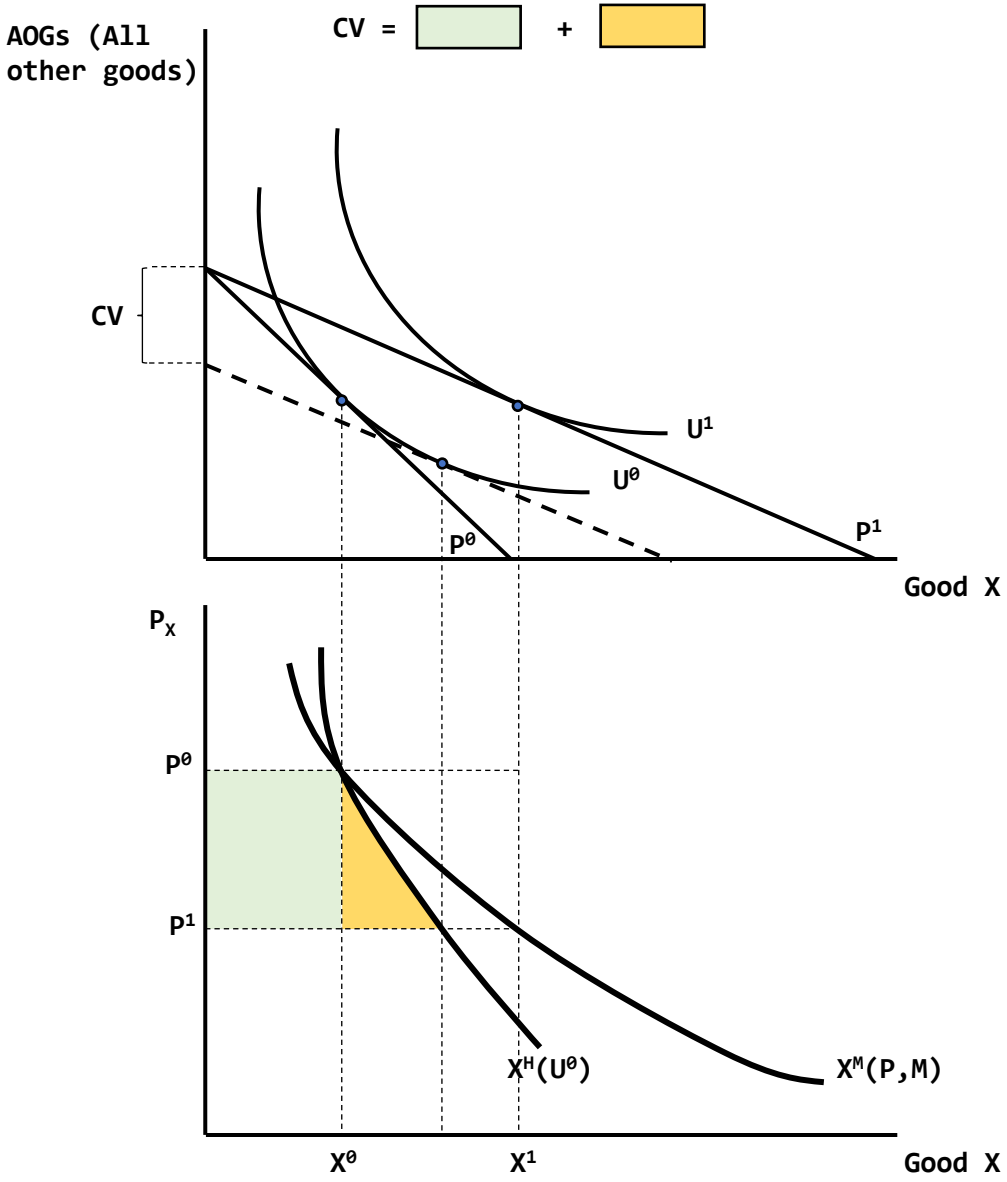


All In One --> Price goes down

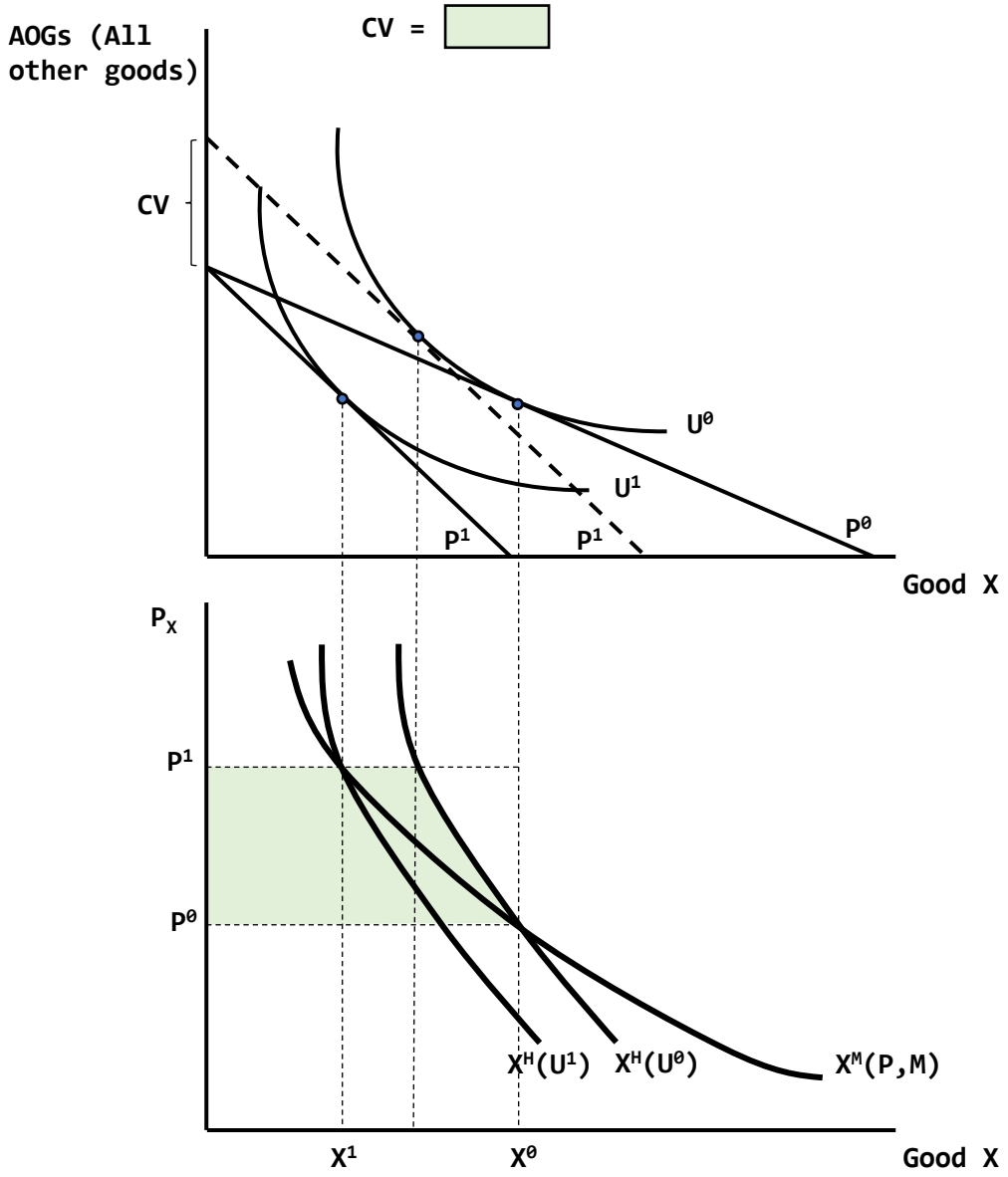




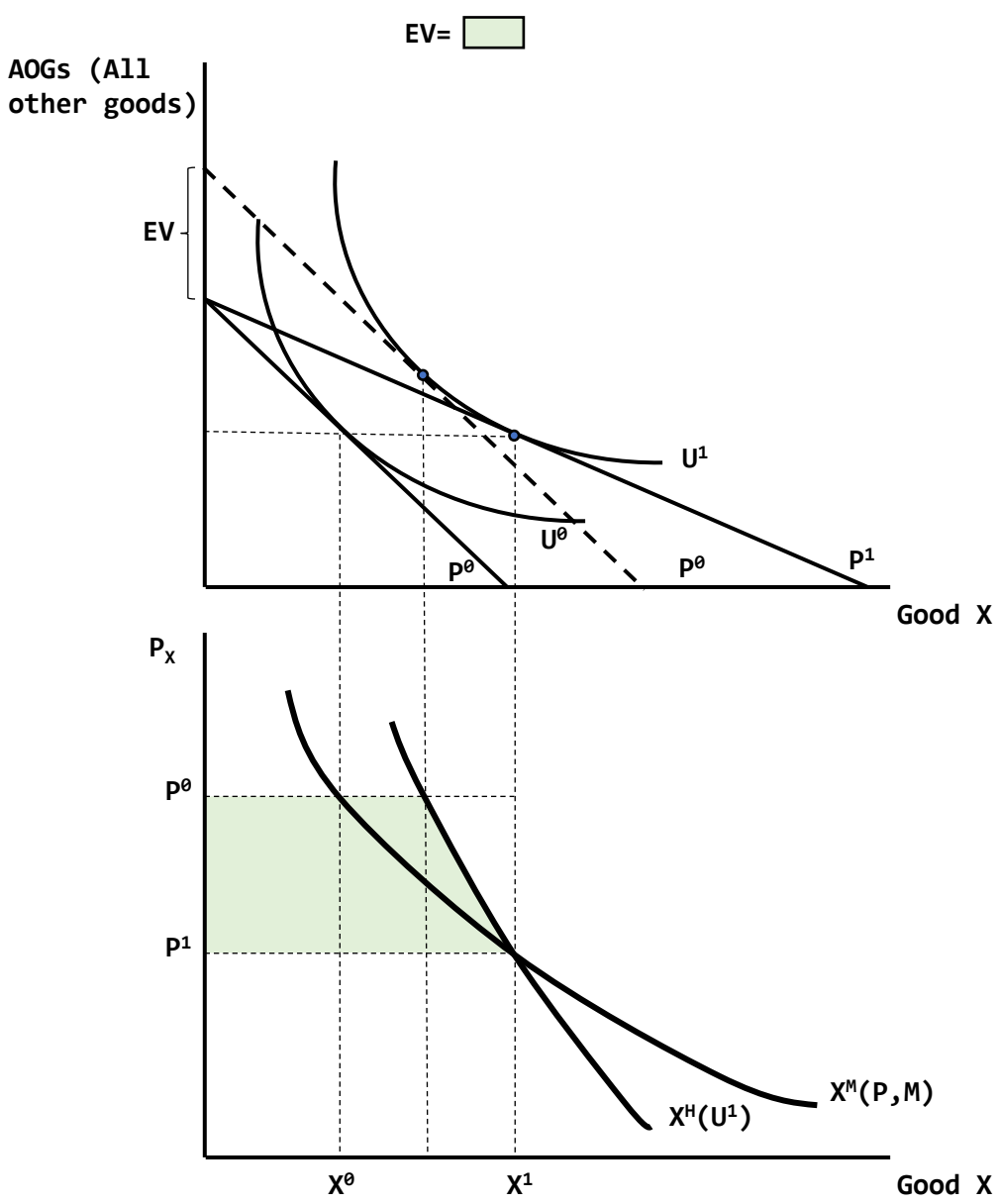
CV --> Price goes **Down**



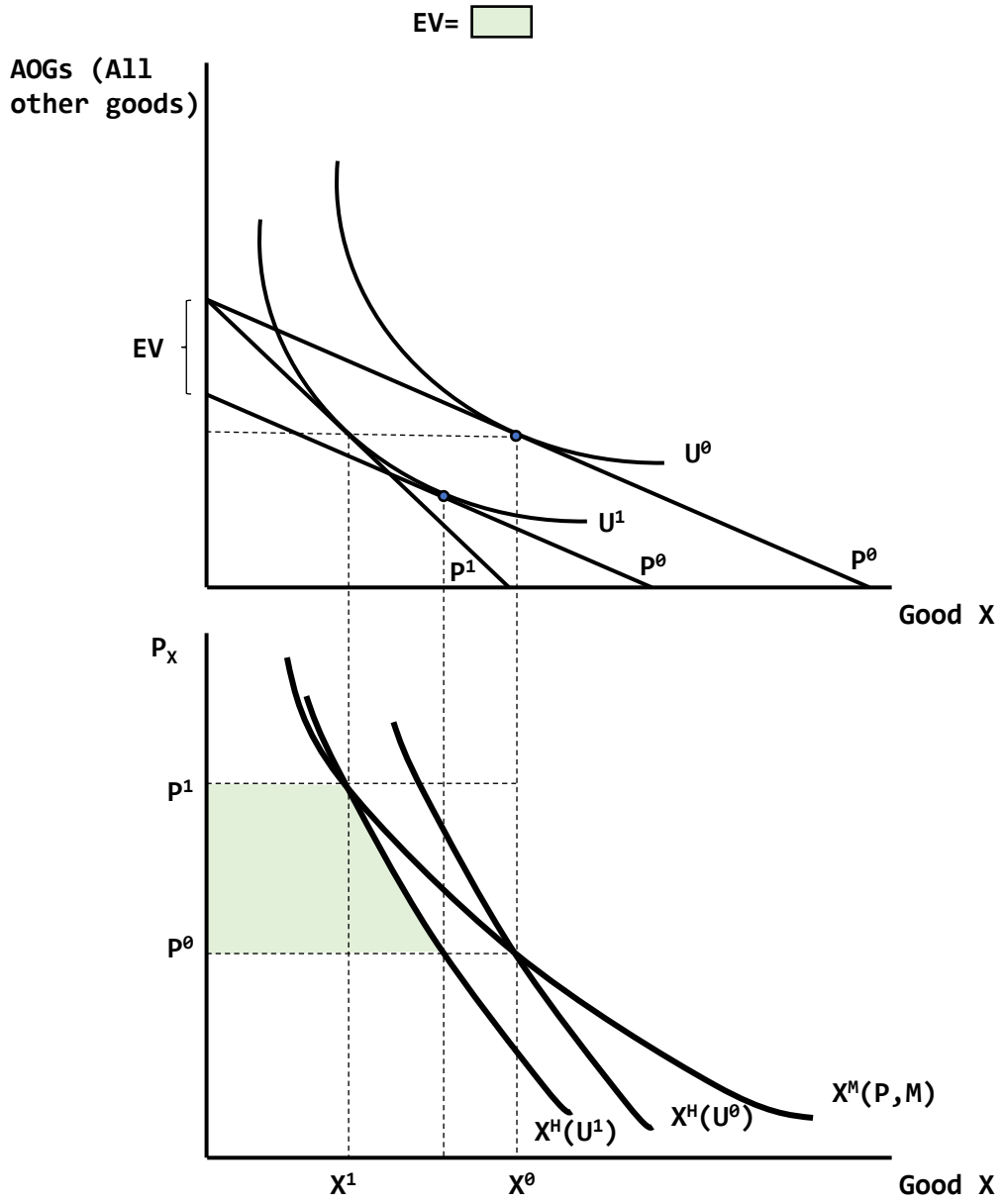
CV --> Price goes **Up**



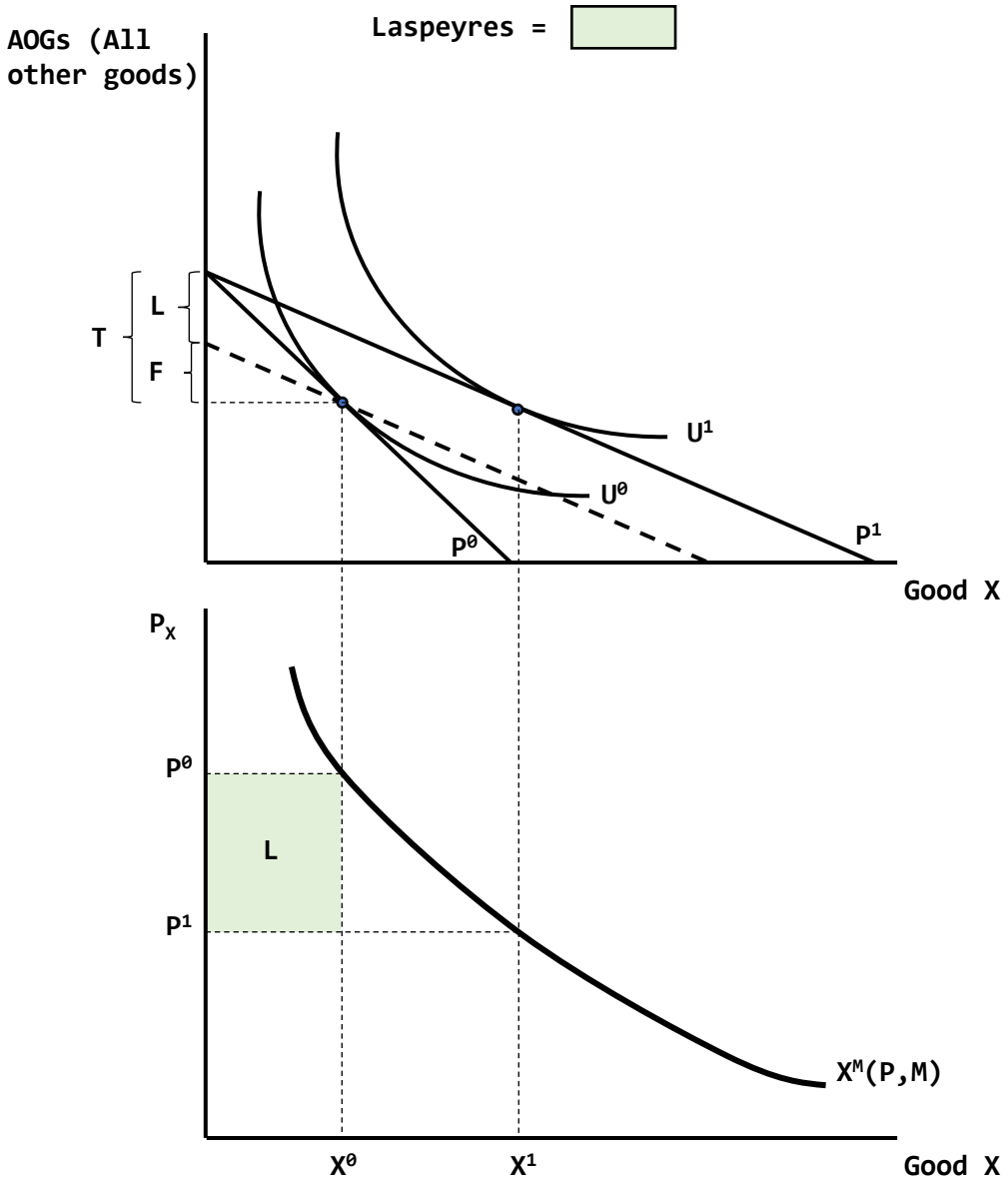
EV --> Price goes **Down**



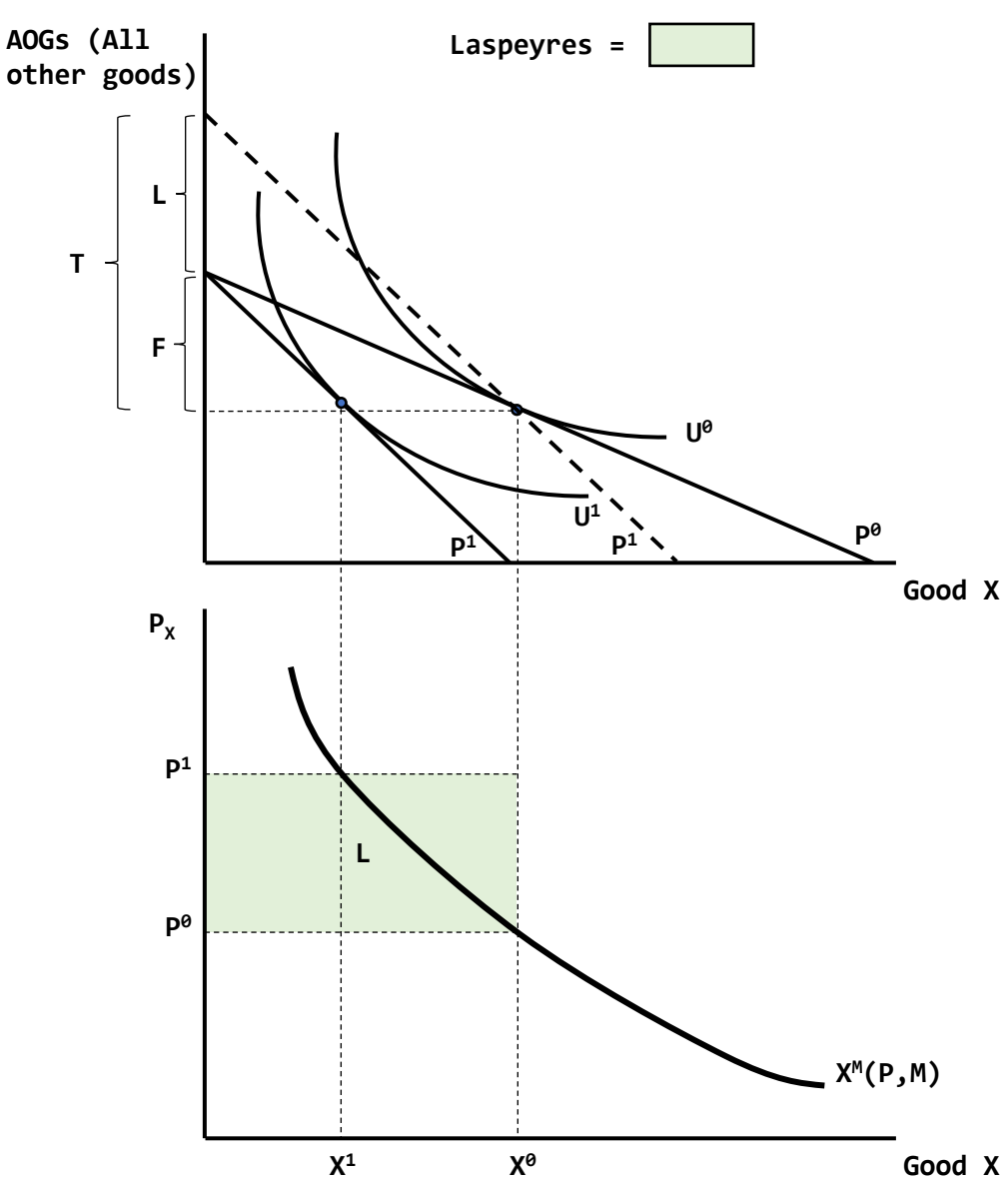
EV --> Price goes **Up**



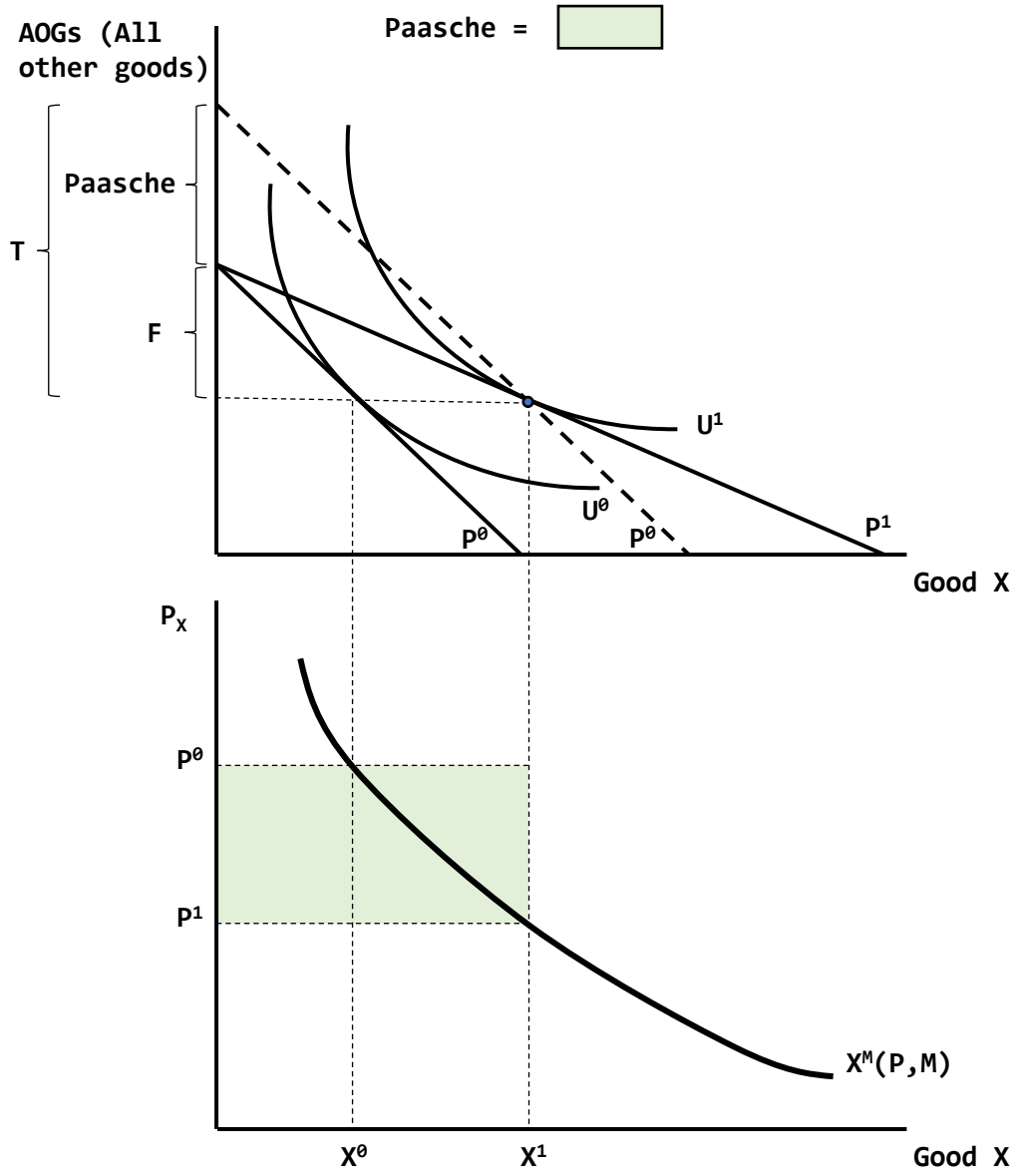
Laspeyres Measures
Price goes **Down**



Laspeyres Measures
Price goes **Up**



Paasche Measures
Price goes **Down**



Paasche Measures
Price goes **Up**