## Slutsky equation

Consider $h_j(p, u^*) = x_j(p, e(p, u^*))$

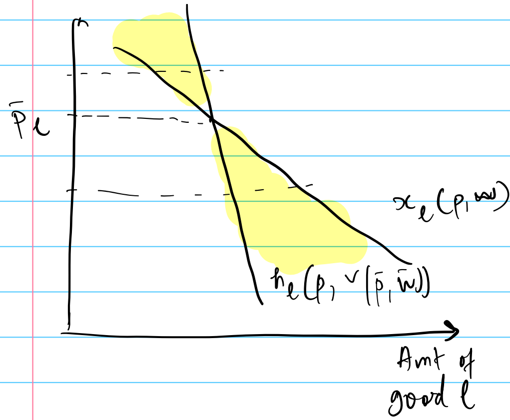
Taking derivative wrt $p_i$

$$\frac{\partial h_j(p^*, u^*)}{\partial p_i} = \frac{\partial x_j(p^*, m^*)}{\partial p_i} + \frac{\partial x_j(p^*, m^*)}{\partial m} \cdot \frac{\partial e(p^*, u^*)}{\partial p_i}$$

$$\frac{\partial h_j(p^*, u^*)}{\partial p_i} = \frac{\partial x_j(p^*, m^*)}{\partial p_i} + \frac{\partial x_j(p^*, m^*)}{\partial m} \cdot x_i^*$$

$$\Rightarrow \boxed{\frac{\partial x_j(p^*, m^*)}{\partial p_i} = \underbrace{\frac{\partial h_j(p^*, u^*)}{\partial p_i}}_{\text{Substitution effect}} - \underbrace{\frac{\partial x_j(p^*, m^*)}{\partial m} \cdot x_i^*}_{\text{Income effect}}}$$

## Normal Good.



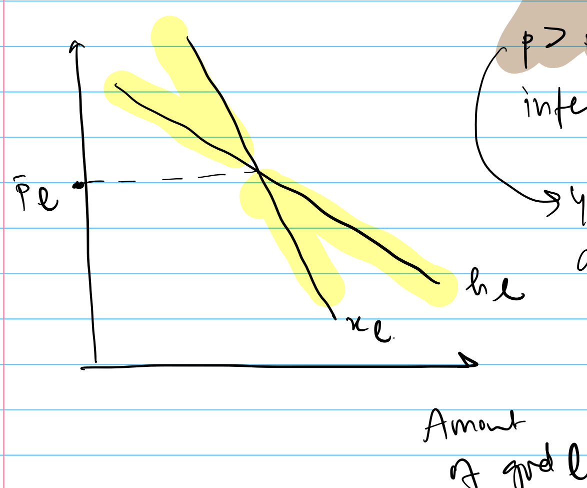

$p > \bar{p}_\ell \Rightarrow h_\ell > x_\ell$

$\Rightarrow$ income effect $\Rightarrow$ consumer is poorer so less consumption in $x_\ell$.

$p < p^\ell \Rightarrow x_\ell > h_\ell$

$\Rightarrow$ income effect $\Rightarrow$ makes consumer richer $\rightarrow$ $x_\ell > h_\ell$.

## Inferior Good.




$p > p^\ell$

inferior good $\rightarrow$ $\dfrac{dx(p,w)}{dw} < 0$

$\rightarrow$ You are poorer, so walrasian dd is higher for the inferior good.

Similarly;

when $p < p^\ell$, you are richer through the income effect so the walrasian demand is lower.