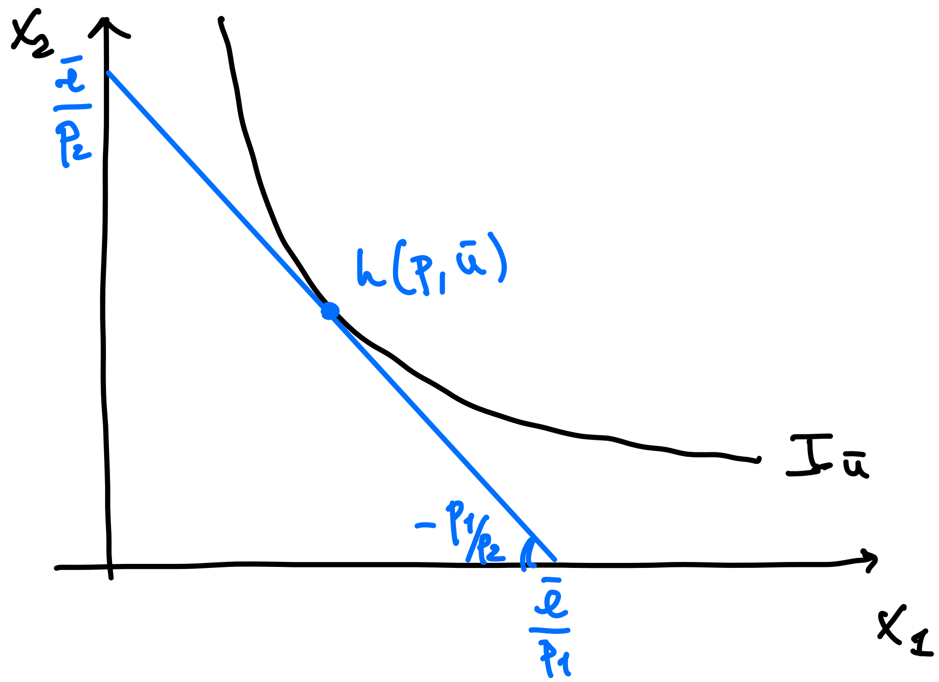
Compensated law of demand

$X = \mathbb{R}^2_+$



$I_{\bar{u}} = \{ (x_1, x_2) \in \mathbb{R}^2_+ : u(x_1, x_2) = \bar{u} \}$

At price $p = (p_1, p_2)$.

Iso-expenditure lines,

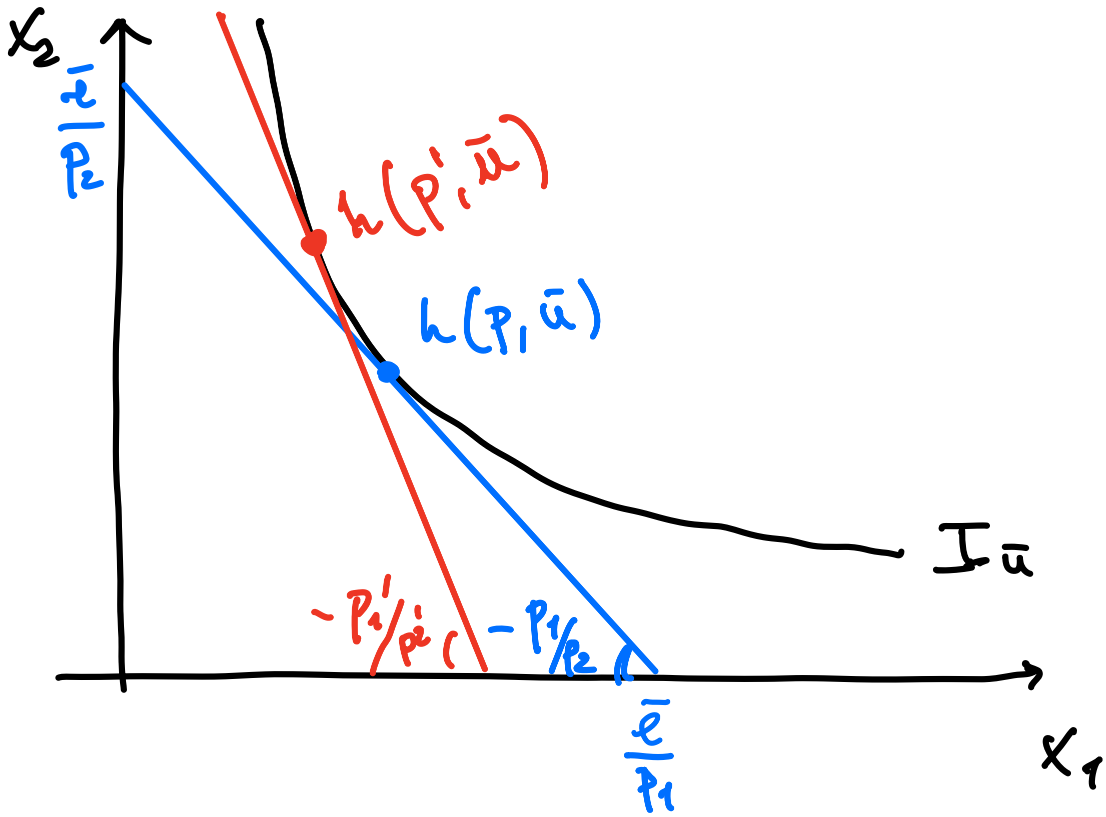
$$p_1 x_1 + p_2 x_2 = \bar{e}$$

$$x_2 = \frac{\bar{e}}{p_2} - \frac{p_1}{p_2} x_1$$

Pairs $(x_1, x_2(x_1))$ such that at price $p=(p_1,p_2)$ they imply expenditure $\bar{e}$.

Consider now a new price vector $p'=(p_1', p_2')$ s.t. $p_1' > p_1$ and $p_2' < p_2$

Slope of the new iso-expenditure line is now increased



At this new prices indeed

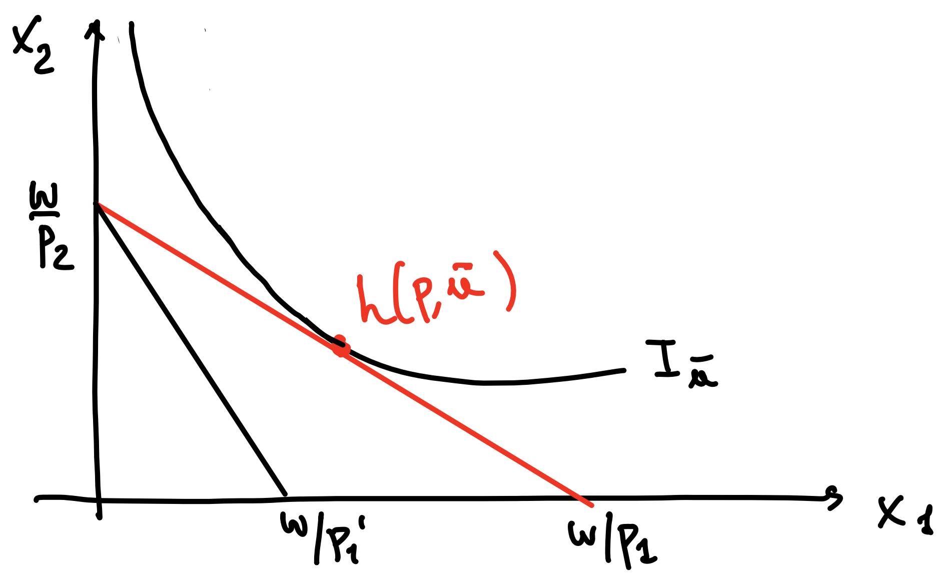
$$h_1(p', \bar{u}) < h_1(p, \bar{u})$$ reduction of the purchase of the commodity that become more expensive

$$h_2(p', \bar{u}) > h_2(p, \bar{u})$$ increase in q.ty purchased of the commodity that is now relatively cheaper

HICKSIAN WEALTH COMPENSATION

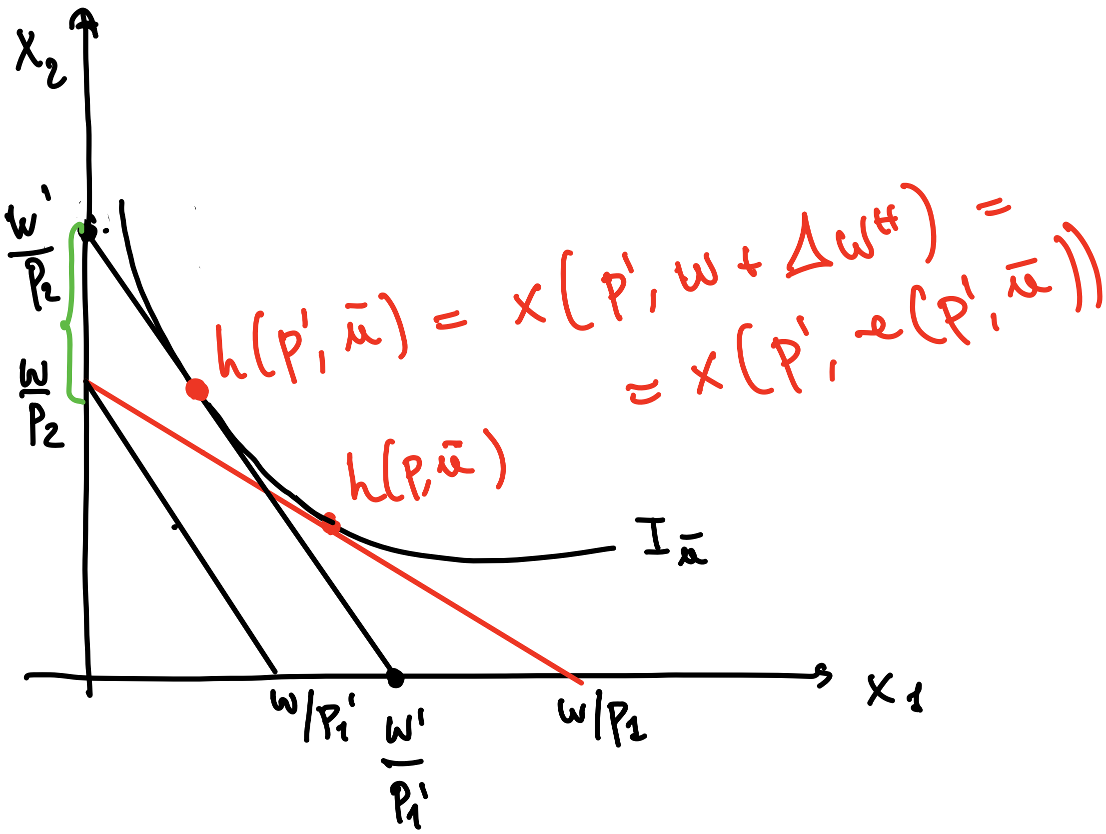
$$h_\ell(p, \bar{u}) = x_\ell(p, e(p, \bar{u})) \quad \forall \ell$$

When prices change the Hicksian demand measures the change in demand that would emerge if we were adjusting "wealth/expenditure" in such a way to keep the consumer at utility $\bar{u}$. Start with (p, w).



Consider a change in prices such that

$$p' = (p_1', p_2') \quad \text{with} \quad p_2' = p_2$$
$$p_1' > p_1$$



$w' \equiv w + \Delta w^H$ with $\Delta w^H \equiv$ Hicksian wealth compensation