Effort requirement is like a dissamenity (Stiglitz & Shapiro)

$$\text{Max } U(X, l, L^*)$$

s.t.
$$l + L \leq T$$
$$X \leq w(e)L$$
$$L^* = eL$$

X ... goods consumed ($p=1$)

l ... leisure

L^* ... Effort (in work L)

$w(e)$ ... wage rate schedule by employer

$$\mathcal{L} = u(x, l, L^*) + \lambda[w(e)L - x] + \mu[T - l - L]$$

$$\frac{\partial \mathcal{L}}{\partial x} = u_x - \lambda \stackrel{!}{=} 0$$

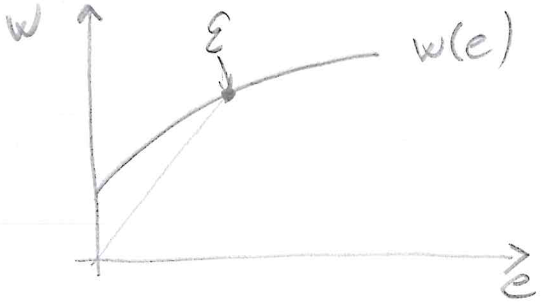
$$\frac{\partial \mathcal{L}}{\partial l} = u_l - \mu \stackrel{!}{=} 0$$

$$\boxed{\frac{u_l}{u_x} = \frac{\mu}{\lambda} = MRS_{l,x}}$$

$$\frac{\partial \mathcal{L}}{\partial L} = u_{L^*} e + \lambda w - \mu \stackrel{!}{=} 0 \rightarrow -\lambda w' e + \lambda w \stackrel{!}{=} \mu$$

$$\boxed{w - w'e = \frac{\mu}{\lambda}}$$

$$\frac{\partial \mathcal{L}}{\partial e} = u_{L^*} L + \lambda w' L \stackrel{!}{=} 0 \rightarrow u_{L^*} = -\lambda w'$$



$$w(e)\left[1 - \frac{w'(e)}{w(e)} \cdot e\right]$$

$$w(e)[1 - \varepsilon_{we}]$$

elasticity of the <u>w</u> wrt <u>e</u>

$$0 < \varepsilon_{we} < 1$$

$$\boxed{\frac{u_l}{u_x} = MRS_{l,x} = w(e)[1 - \varepsilon_{we}] < w(e)}$$

model by Becker: effort out of work

$$\text{Max } U(X, l^*)$$

s.t.

$$l^* = z(e_l) \cdot l$$

$$X = w(e_L) \cdot L$$

$$L + l = T$$

$$e_l l + e_L L = \bar{E}$$

l^* ... effective leisure

$\bar{E}$ .... max. effort

$$\mathcal{L} = u(X, z(e_l) l) + \lambda [w(e_L) L - X] \text{ fin.}$$
$$+ \mu [T - L - l] \text{ time}$$
$$+ \phi [\bar{E} - e_l l - e_L L] \text{ eff.}$$

constr.

Efficiency wages

Our original models:

- spot mkt
- people are the same L_i
- unit of time are equaly productive
- nothing else matter (no other costs)
- product is observed perfectly
- if $w > w^* \rightarrow \Pi < 0$ leaving the mkt
- if $w < w^* \rightarrow \Pi > 0$ but not hiring L

What if more realistic mkt if $w > w^*$?

- hiring (selecting) higher ability $L \rightarrow \nearrow Q|L$
- higher effort of $L \rightarrow \nearrow Q|L$
- Lower shirking of $L \rightarrow \nearrow Q|L$
- Lower absenteesm of $L \rightarrow \searrow C$
- Lower turnover of $L \rightarrow \searrow C$
- Better health of $L \rightarrow \nearrow Q|L$

Ford Model T

before:
turnover 370%
absenteesm 10%

after:
$9 \rightarrow 8$ hours
$2.3 \rightarrow 5$ \$/day
turnover 16%
Abs 2.5%

Does it pay of? $\rightarrow \Pi \geq 0$
Can it survive?

$C = Lw \rightarrow \frac{\partial c}{\partial w} = L$

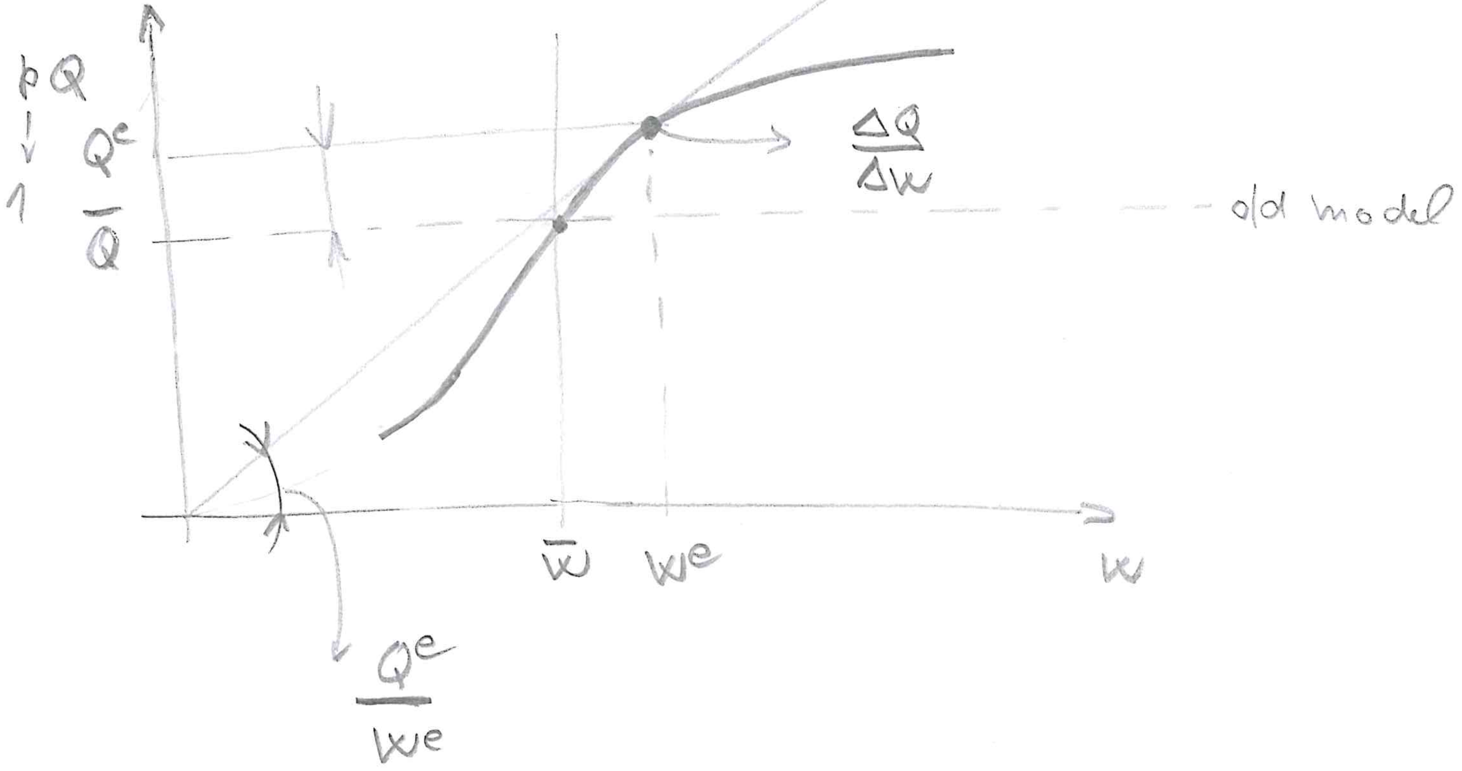
$$p \frac{\partial Q}{\partial w} > \frac{\partial c}{\partial w} = L = p \frac{Q}{w}$$

comp. mkt $\quad \Pi = pQ - Lw = 0$

$$L = p\frac{Q}{w}$$

$$\boxed{\frac{\Delta Q}{\Delta w} = \frac{Q}{w}}$$

$p = 1$



The incidence of efficiency wage will depend on:

- observability of interim & final products (quality
- scope for shirking
- costs of supervision
- costs of labor search
- costs of turnover (HC)
- share of women (other benefits)
- observability of productive skills (diplomas as a signal)