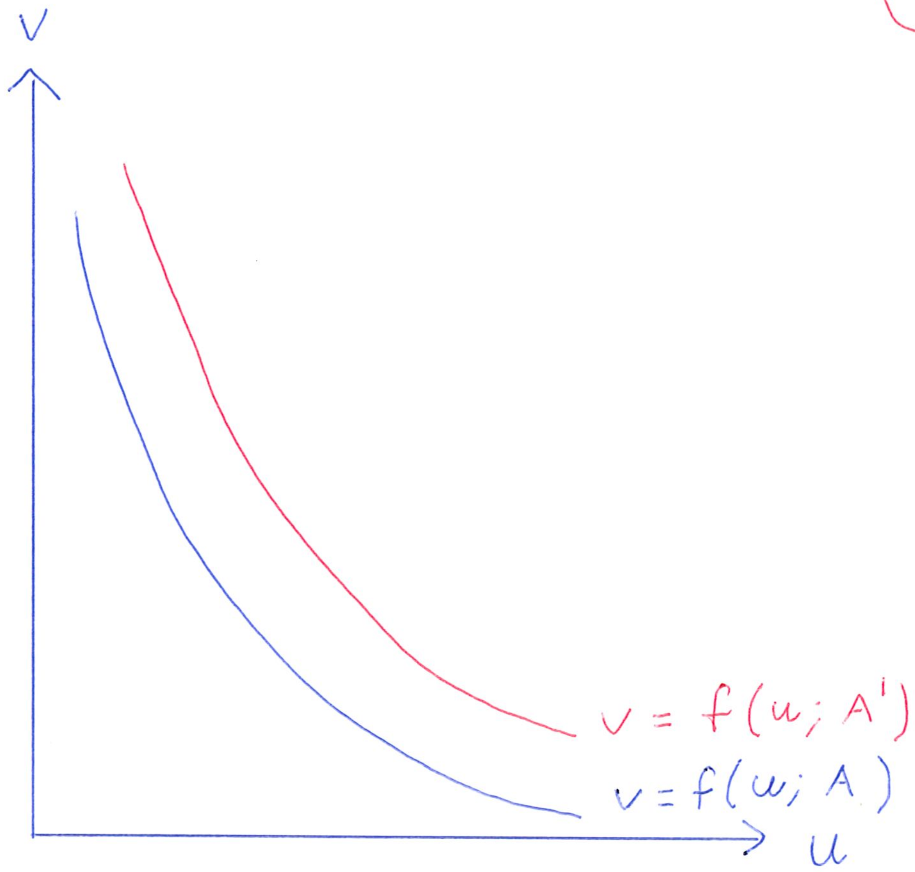
Slide 12

1



~~[illegible]~~ $A \to A'$

~~[illegible]~~ $A' < A$

Slide 19

Subtract value function equations

$$rW - rU = w + \sigma(U - W) - b - \lambda_w (W - U)$$

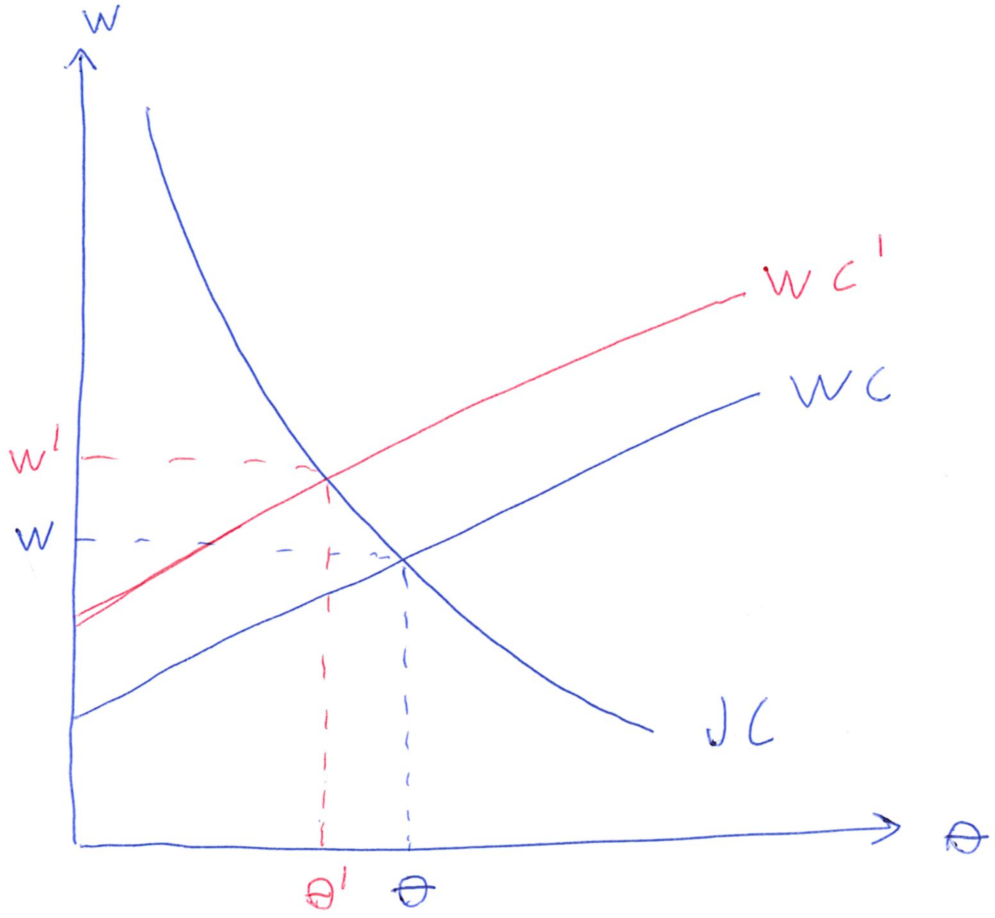
$$\Leftrightarrow \quad (r + \sigma + \lambda_w)(W - U) = w - b$$

$$\Leftrightarrow \quad W - U = \frac{w - b}{r + \sigma + \lambda_w}$$

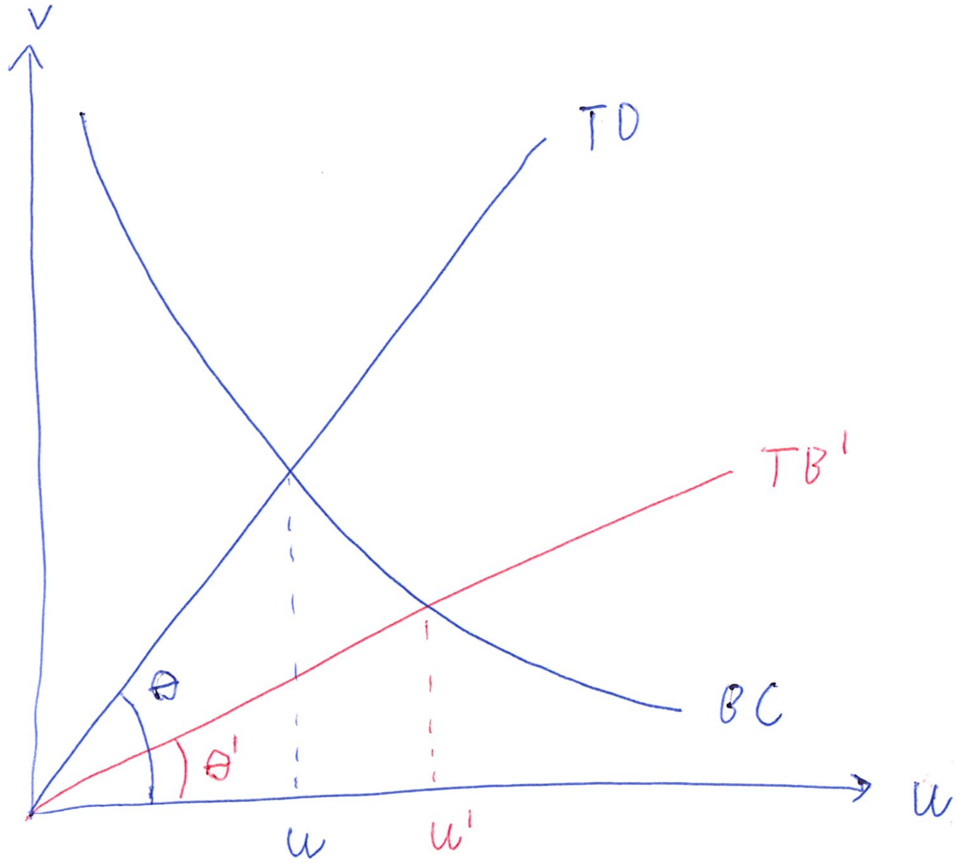
~~2~~

Slide 28

1



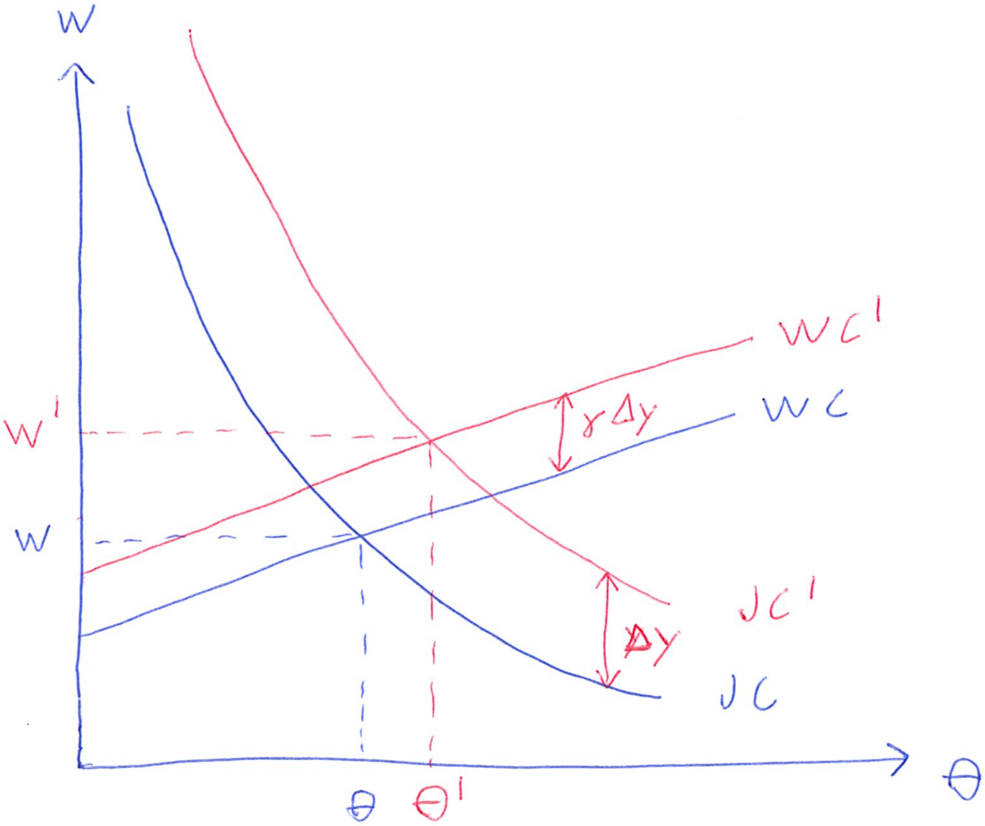
$b \to b'$, $b' > b$



~~3~~

Slide 28

2



$y \rightarrow y', \quad y' > y$

Slide 35

$$\varepsilon_{M,U} = \frac{\partial M}{\partial u} \frac{u}{M}$$

$$= \frac{\partial u \frac{M}{u}}{\partial u} \frac{u}{M}$$

$$= \frac{\partial u \lambda_u(\theta)}{\partial u} \cdot \frac{1}{\lambda_u(\theta)}$$

$$= \left(\lambda_u(\theta) + u \lambda_u'(\theta) \frac{\partial \theta}{\partial u} \right) \cdot \frac{1}{\lambda_u(\theta)}$$

$$= 1 + \frac{\lambda_u'(\theta)}{\lambda_u(\theta)} \cdot u \frac{\partial \theta}{\partial u}$$

$$\left(\theta = \frac{V}{u} \right)$$

$$= 1 + \frac{\lambda_u'(\theta)}{\lambda_u(\theta)} \cdot u \left(- \frac{V}{u^2} \right)$$

$$= 1 - \frac{\theta \lambda_u'(\theta)}{\lambda_u(\theta)}$$

$$\frac{c}{\lambda_v(\theta)} = \frac{(1-\gamma)(y-b)}{r+6+\gamma\lambda_u(\theta)}$$

~~4~~

Slide 49

1

Use $\lambda_v(\theta) = \dfrac{\lambda_u(\theta)}{\theta}$

$$\Rightarrow \quad \frac{c\theta}{\lambda_u(\theta)} = \frac{(1-\gamma)(y-b)}{r+6+\gamma\lambda_u(\theta)}$$

Total differentiation

$$\frac{c\lambda_u(\theta) - c\theta\lambda_u'(\theta)}{[\lambda_u(\theta)]^2}\,d\theta + 0\,dy$$

$$= \frac{(1-\gamma)(y-b)}{[r+6+\gamma\lambda_u(\theta)]^2}(-1)\gamma\lambda_u(\theta)\,d\theta + \frac{(1-\gamma)}{r+6+\lambda_u(\theta)}\,dy$$

$$\Leftrightarrow \quad \frac{c}{\lambda_u(\theta)}\left[1 - \frac{\theta\lambda_u'(\theta)}{\lambda_u(\theta)}\right]d\theta$$

$$= \underbrace{\frac{(1-\gamma)(y-b)}{r+6+\gamma\lambda_u(\theta)}}_{\frac{c\theta}{\lambda_u(\theta)}}\left[-\frac{\gamma\lambda_u'(\theta)}{r+6+\gamma\lambda_u(\theta)}\,d\theta + \frac{1}{y-b}\,dy\right]$$

~~5~~

Slide 49

2

$$\Leftrightarrow \quad \left[1 - \frac{\theta \lambda_w'(\theta)}{\lambda_w(\theta)}\right] d\theta$$

$$= - \frac{\gamma \lambda_w(\theta)}{r + \delta + \gamma \lambda_w(\theta)} \quad \frac{\theta \lambda_w'(\theta)}{\lambda_w(\theta)} d\theta + \frac{\theta}{y} \, \frac{y}{y-b} \, dy$$

Notice: $\quad \dfrac{\theta \lambda_w'(\theta)}{\lambda_w(\theta)} = \dfrac{\partial \lambda_w}{\partial \theta} \cdot \dfrac{\theta}{\lambda_w} = \varepsilon_{\lambda_w, \theta}$

$$\Leftrightarrow \quad \left[1 - \varepsilon_{\lambda_w,\theta} + \frac{\gamma \lambda_w(\theta) \, \varepsilon_{\lambda_w,\theta}}{r + \delta + \gamma \lambda_w(\theta)}\right] \underbrace{\frac{y}{\theta} \, \frac{d\theta}{dy}}_{\varepsilon_{\theta,y}} = \cancel{\frac{\theta}{y}} \, \frac{y}{y-b} \, \cancel{dy}$$

$$\Leftrightarrow \quad \frac{(1 - \varepsilon_{\lambda_w,\theta})(r + \delta + \gamma \lambda_w(\theta)) + \gamma \lambda_w(\theta) \, \varepsilon_{\lambda_w,\theta}}{r + \delta + \gamma \lambda_w(\theta)} \, \varepsilon_{\theta,y} = \frac{y}{y-b}$$

$$\Leftrightarrow \quad \frac{(r + \delta)(1 - \varepsilon_{\lambda_w,\theta}) + \gamma \lambda_w(\theta)}{r + \delta + \gamma \lambda_w(\theta)} \, \varepsilon_{\theta,y} = \frac{y}{y-b}$$

$$\Leftrightarrow \quad \varepsilon_{\theta,y} = \frac{y}{y-b} \cdot \frac{r + \delta + \gamma \lambda_w(\theta)}{(r + \delta)(1 - \varepsilon_{\lambda_w,\theta}) + \gamma \lambda_w(\theta)}$$