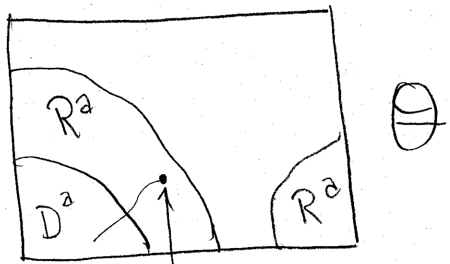
Recall:



If a point like this exists, then A is uniquely rationalizable when ε is small.

"Public" Information

Suppose $\Theta \sim N(y, \tau^2)$ and $\varepsilon\eta_i \sim N(0, \sigma^2)$

- these distributions are common knowledge

Given $x_i = \Theta + \varepsilon\eta_i$

$$\Theta \sim N(r x_i + (1-r)y, \sigma^2 r)$$

- this uses the normal updating formula;
  - $r = \frac{\tau^2}{\sigma^2 + \tau^2}$

This gives us: $x_j \sim N(r x_i + (1-r)y, \sigma^2(r+1))$,

since $x_j = \Theta + \varepsilon\eta_j \sim N(r x_i + (1-r)y, \sigma^2 r + \underbrace{\sigma^2}_{var(\varepsilon\eta_j)})$

$$\Rightarrow \begin{pmatrix} \Theta \\ x_j \end{pmatrix} \sim N\left(\begin{bmatrix} r x_i + (1-r)y \\ r x_i + (1-r)y \end{bmatrix}, \begin{bmatrix} r\sigma^2 & r\sigma^2 \\ r\sigma^2 & (r+1)\sigma^2 \end{bmatrix} \right)$$

- increases in x_i in FOSD sense

Thus, this game is monotone supermodular

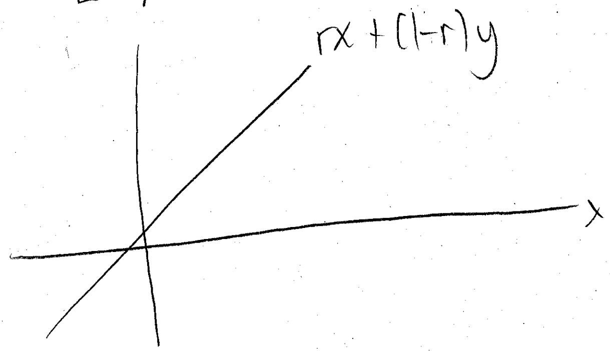
This will lead to a monotone symmetric NE with cutoff x^c.

at the cutoff, the x^c-type must be indifferent

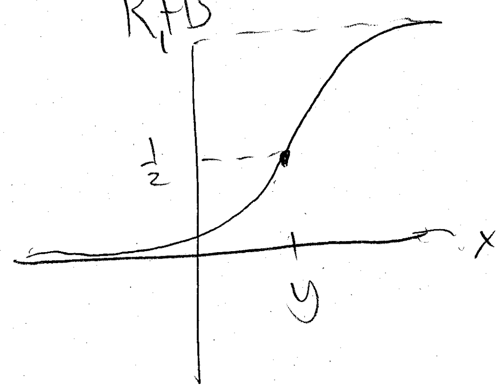
$$rx^c + (1-r)y = \Pr[x_j \le x^c \mid x_i = x^c] = \Phi\left(\frac{(1-r)(x^c-y)}{\sigma(1+r)^{1/2}}\right)$$

$$= F\left(\underbrace{\frac{x_j - rx^c - (1-r)y}{\sigma(1+r)^{1/2}}}_{\text{std. normal}} \le \frac{x^c - rx^c - (1-r)y}{\sigma(1+r)^{1/2}}\right)$$

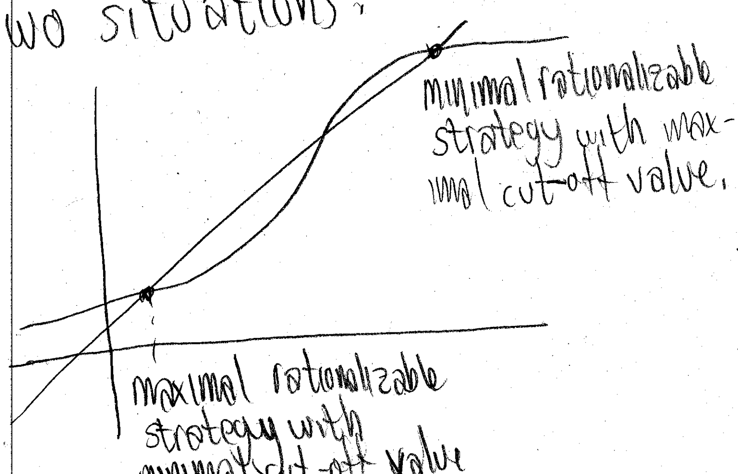
LHS,

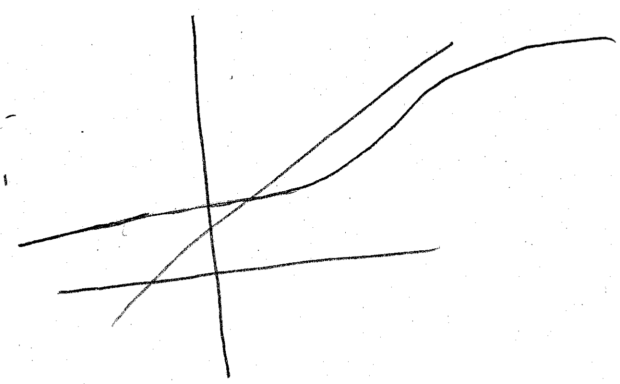


RHS

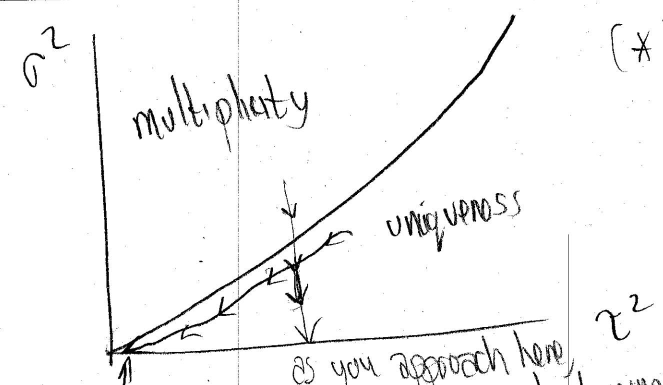


Two situations:





If $rx^c + (1-r)y - \Pr(x_j \le x^c \mid x_i = x^c)$ is increasing in x^c whenever $\sigma^2 < 2\pi\tau^4(r+1)$



here, unique solution, but it can be anything

as you approach here, get unique risk dominant strategy (Carlsson and Van Damme)

(*) Read the paper

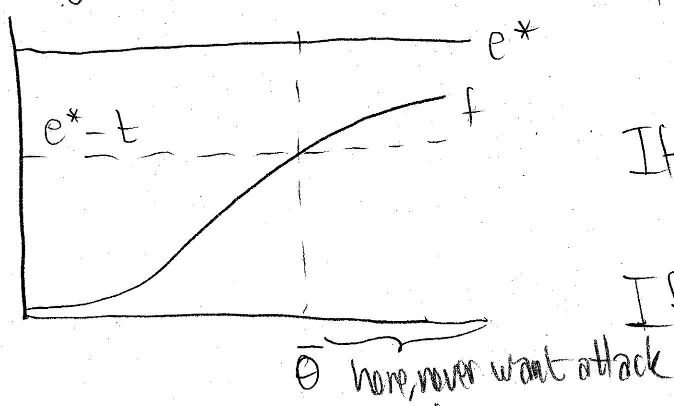
- this picture is misleading, since it is just part of a higher dimensional space.

- solution is very sensitive to how we choose the perturbation.

Morris and Shin: Currency attacks

- Fundamental $\theta \in [0,1]$ (θ measures strength of economy)
- Competitive exchange rate: $f(\theta)$ (ie $\frac{\$1}{17000\,TL}$ Turkish Lira)
    - f is increasing
- Exchange rate is pegged at $e^* \geq f(1)$
- continuum of speculators who
    - attack at cost t (short sell TL)
    - not attack
- Government defends or not
- If defended, exchange rate stays at e^*, $f(\theta)$ otherwise.
- Gov't knows θ, but we do not.

Exchange rate



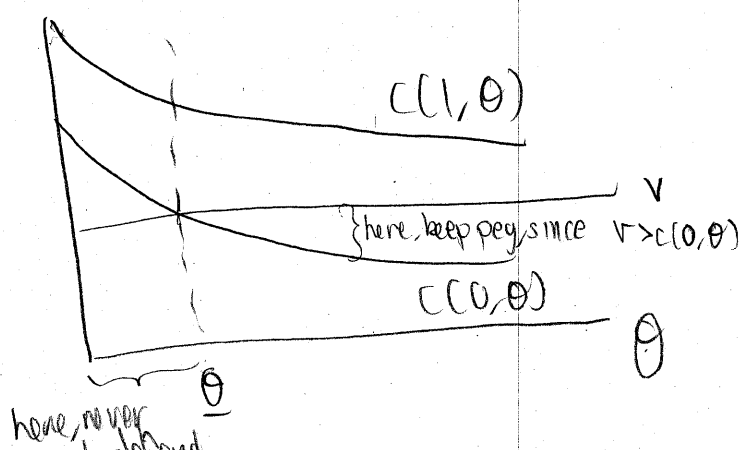
If attack and it is not defended, get $\underbrace{e^*}_{\text{sell dollars}} - \underbrace{f(\theta)}_{\text{buy Lira}} - t$

If attack and it is defended, get $e^* - e^* - t = -t$

If not attack, get 0.

Government's payoffs

- v - value of peg
- cost of defending $c(\alpha, \theta)$, where α is ratio of speculators who attack.
- c increasing in α, decreasing in θ



assume $\exists\, \underline{\theta}$ s.t. $\theta < \underline{\theta} \Rightarrow$ gov't never wants to defend.