Cobb-Douglas Matching Function

Pascal Michaillat
www.pascalmichaillat.org

$M =$ # trades

$S =$ # sellers

$B =$ # buyers

$$M = \omega \, S^{n} \cdot B^{1-n}$$

- $m(0, B) = m(S, 0) = 0$

- $\dfrac{\partial m}{\partial S} > 0 \qquad \dfrac{\partial m}{\partial B} > 0$

- Constant returns to scale

$$m(\lambda S, \lambda B) = \omega \cdot (\lambda S)^{n} \, (\lambda B)^{1-n}$$

$$= \omega \, \underbrace{\lambda^{n} \, \lambda^{1-n}}_{\lambda} \, S^{n} \, B^{1-n}$$

$$= \lambda \, \omega \, S^{n} \, B^{n}$$

$$m(\lambda S, \lambda B) = \lambda \, m(S, B)$$

Cobb-Douglas function can be <u>calibrated</u>

ω . matching efficacy

n matching elasticity

(exponent on # of sellers

1 Trading probabilities are simple.

$f(\theta)$ = selling proba = $\dfrac{M}{S}$ = $\omega \, S^{\eta-1} \, B^{1-\eta}$

$\qquad = \omega \left(\dfrac{B}{S}\right)^{1-\eta}$

$$\boxed{f(\theta) = \omega \, \theta^{1-\eta}}$$

$g(\theta)$ = buying proba = $\dfrac{M}{B}$ = $\omega \, S^{\eta} \, B^{-\eta}$

$g(\theta) = \omega \left(\dfrac{S}{B}\right)^{\eta}$

$$\boxed{\theta = B/S}$$

$$\boxed{g(\theta) = \omega \cdot \theta^{-\eta}}$$

2. Cobb Douglas is realistic matching function
(Petrongolo & Pissarides 2001)

$$\boxed{0\,5 \leqslant \eta \leqslant 0\,7}$$ $\longrightarrow$ common to calibrate
$\qquad\qquad\qquad\qquad\qquad \eta = 0\,5$