

$$A = \frac{x-y}{x}$$

$$B = x$$

$$u_1(x,y) = \frac{x-y}{x}$$

$$u_2(x,y) = x$$

$$x = b$$

$$a = \frac{x-y}{x} = \frac{b-y}{b}$$

$$ab = b-y$$

$$\Rightarrow y = b-ab$$

BOUNDS

$$x > 0 \Rightarrow b > 0$$

$$x < 4 \Rightarrow b < 4$$

$$y > 0 \Rightarrow b-ab > 0$$

$$b > ab$$

$$1 > a$$

$$a < 1$$

($b > 0$)

$$y < x \Rightarrow$$

$$b-ab < b$$

$$-ab < 0$$

$$-a < 0$$

$$a > 0$$

($b > 0$)

$$\Rightarrow a \in (0,1) \quad b \in (0,4)$$

$$J = \begin{vmatrix} 0 & 1 \\ -b & 1-a \end{vmatrix} = b$$

~~$f_{x,y}(x,y)$~~

$$f_{A,B}(a,b) = f_{x,y}(v_1(a,b), v_2(a,b)) | b|$$

$$= f_{x,y}(b, b-ab) b$$

$$= \frac{b}{8} \quad \begin{matrix} a \in (0,1) \\ b \in (0,4) \end{matrix}$$

$$a = x+y$$

$$b = x-y$$

$$a+b = 2x$$

$$x = \frac{a+b}{2}$$

$$a-b = 2y$$

$$y = \frac{a-b}{2}$$

$$x > 0 \Rightarrow \frac{a+b}{2} > 0 \Rightarrow a+b > 0 \Rightarrow b > -a$$

$$x < 1 \Rightarrow \frac{a+b}{2} < 1 \Rightarrow a+b < 2 \Rightarrow b < 2-a$$

$$y > 0 \Rightarrow \frac{a-b}{2} > 0 \Rightarrow a-b > 0 \Rightarrow b < a$$

$$y < 1 \Rightarrow \frac{a-b}{2} < 1 \Rightarrow a-b < 2 \Rightarrow b > a-2$$

$$A = XY \quad B = X$$

$$x = b$$

$$y = a/b$$

$$x > 0$$

$$b > 0$$

$$x < 1$$

$$b < 0$$

$$y > 0 \Rightarrow a/b > 0 \quad a > 0$$

$$y < 1 \Rightarrow a/b < 1 \quad a < b$$

$$\Rightarrow 0 < a < b < 1$$