Lecture 6

Chapter 7

Applications to Comparative – Static Analysis

How the equilibrium value of an endogenous variable will change when there is a change in any of the exogenous variables or parameters.

Market Model

$$Q=a-bp \left(D\right) (a,b>0)$$

$$Q=-c+dp \left(S\right) (c,d>0)$$

Solutions: (Valued firms)

$$p^{\*}=\frac{a+c}{b+d} Q^{\*}=\frac{ad-bc}{b+d}$$

$$\frac{∂p^{\*}}{∂a}=\frac{1}{b+d}$$

$$\frac{∂p^{\*}}{∂b}=\frac{d\left(b+d\right)-1\left(a+c\right)}{\left(b+d\right)^{2}}=\frac{-\left(a+c\right)}{\left(b+d\right)^{2}} \left(quotient rule\right)$$

$$\frac{∂p^{\*}}{∂c}=\frac{1}{b+d} \left(=\frac{∂p^{\*}}{∂a}\right)$$

$$\frac{∂p^{\*}}{∂d}=\frac{0\left(b+d\right)-1(a+c)}{(b+d)^{2}}=\frac{-(a+c)}{(b+d)^{2}}\left(=\frac{∂p^{\*}}{∂b}\right)$$

$$\frac{∂p^{\*}}{∂a}=\frac{∂p^{\*}}{∂c}>0 and \frac{∂p^{\*}}{∂b}=\frac{∂p^{\*}}{∂d}<0$$

 Q Q

 a$\uparrow $ b$\uparrow $

 S S

 D’ D

 D D’

0 $ p^{\*} p^{\*}'$ p $p^{\*}^{'} p^{\*}$ p

 Q Q

 c$\uparrow $ S d$\uparrow $ S’

 S’ S

 D

 D

0 $ p^{\*} p^{\*}'$ p $p^{\*}^{'} p^{\*}$ p

National Income Model

$$Y=C+I\_{0}+G\_{0}$$

$$C=α+β\left(Y-T\right) (α>0, 0<β<1)$$

$$T=γ+δY \left(γ>0, 0<δ<1\right)$$

$$Y^{\*}=\frac{α-βγ+I\_{0}+G\_{0}}{1-β+βδ}$$

$$\frac{∂Y^{\*}}{∂G\_{0}}=\frac{1}{1-β+βδ}>0; goverment-expect multiplier$$

$$\frac{∂Y^{\*}}{∂γ}=\frac{-β}{1-β+βδ}<0; non-income tax multiplier$$

$$\frac{∂Y^{\*}}{∂G\_{0}}=\frac{-β(α+βγ+I\_{0}+G\_{0})}{1-β+βδ^{2}}=\frac{-βY^{\*}}{1-β+βδ}<0, \frac{∂Y^{\*}}{∂G\_{0}} and \frac{∂Y}{∂G\_{0}} are different$$

The Jacobian determinant |J| defined in formula will be identically zero for all values of $x\_{1},…, x\_{n}$ if and only if the n functions $f^{1},…, f^{n} \left(1\right)$ are funtivnely (linearly or non-linearly) dependent.