

51. 替代弹性

(a)  $F(K, L) = K^{\frac{1}{2}} L^{\frac{1}{2}}$

$\sigma = \frac{\Delta(\frac{K}{L})}{\Delta MRTS_{LK}} \times \frac{MRTS_{LK}}{(\frac{K}{L})}$

$MRTS_{LK} = \frac{MP_L}{MP_K}$ ,  $MP_L = \frac{1}{2} L^{-\frac{1}{2}} K^{\frac{1}{2}}$   
 $MP_K = \frac{1}{2} L^{\frac{1}{2}} K^{-\frac{1}{2}}$

$MRTS_{LK} = \frac{K}{L} \cdot \frac{(\frac{K}{L})}{\Delta MRTS_{LK}} = 1$

$\sigma = 1 \times \frac{MRTS_{LK}}{MRTS_{LK}} = 1$

(b)  $F(K, L) = 2K + L$

$MRTS_{LK} = \frac{MP_L}{MP_K} = \frac{1}{2}$

$\Delta MRTS_{LK} = 0$

$\sigma = \frac{\Delta(\frac{K}{L})}{\Delta MRTS_{LK}} = \infty$

STEP 2:  $\frac{K}{L} \rightarrow 0$

STEP 1:  $\frac{K}{L} \rightarrow \infty$

8. 产量弹性

$q = 5LK$   $q = 2L + 3K$   $q = \min(L, K)$   $q = (0.2L^{-0.5} + 0.8K^{-0.5})^{-2}$

$MP_L = 5K$   $MP_L = 2$   $MP_L = 0.2L^{-0.5} + 0.8K^{-0.5}$

$MP_K = 5L$   $MP_K = 3$   $MP_K = 0.2L^{-0.5} + 0.8K^{-0.5}$

替代弹性

$\frac{5K}{5L} = \frac{K}{L}$   $\frac{2}{3}$   $\frac{0.2L^{-0.5}}{0.8K^{-0.5}} = \frac{L^{-0.5}}{4K^{-0.5}}$

规模报酬

CRTS, IRTS, DRTS

产量弹性

$EL = \frac{MP_L}{APL} = \frac{5K}{5K} = 1$   $EL = \frac{2L}{2L+3K}$   $EL = 0.12245$

$EK = \frac{5L}{5L} = 1$   $EK = \frac{3K}{2L+3K}$   $EK = 0.8K^{-0.5}$

生产弹性

$EL + EK = 2$   $1$   $1$   $0.1$

替代弹性

$\frac{d\sigma}{dL} = 0$   $\frac{d\sigma}{dL} = -2(0.2L^{-0.5} + 0.8K^{-0.5})^{-3} \cdot (-0.15) L^{-1.5}$

$= 0.2 L^{-1.5} (0.2L^{-0.5} + 0.8K^{-0.5})^{-3}$

9.  $Q = 3K + 2L$

① 正确

$\lambda(3K + 2L) = \lambda Q$

$\lambda(3K + 2L) = \lambda Q$

② 错误, 因为

$MP_L: 2$

$MP_K: 3$

③ 正确

$MRTS_{LK} = \frac{MP_L}{MP_K} = \frac{2}{3}$