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Non linearity modeling for Cobb-Douglas Function

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Abstract: *- The Cobb-Douglas function is investigated in this paper. Some changed parameters are used to observe this function. Different α, β& γ replaces to analyze the relationship. While α increase β increases to form increasing function. α >β trend is found in this paper, that says the effective size turn. That α increases leads K become high, meantime that β increases leads K become high.*

Keywords: *- model； non linearity; Cobb-Douglas function; α, β&γ*

1. Introduction

The relationship between labor and capital amount is important of Cobb-Gouglas function to short & long time cost control in micro economics. It will give us the principle in every respect about Q and cost relationship with this equation. But there is not fitted compare between parameter of this dominant equation. We still lie in a slight course to this principle of knowledge to use for solving the fact numerical calculation. We are still exist in preliminary stage about this principle production function. So this paper will investigate the relationship to observe the effective size in terms of changing parameter α &β. Furthermore through changing Q it will be found what the two factors' internal feature is. Because this formula is the fundamental one in micro economics for instance production and labor & capital in real use it is worthy of finding the internal effection between L and K even α&β.

2. Numerical course

Cobb-Gouglas function is

$$Q = \gamma L^{\alpha} K^{\beta} \text{--(1)}$$

Here α &β calls labor & capital elasticity; γ is technological parameter.

Take logarithm and transform it has

$$LNL = \frac{LN(Q/\gamma/K^{\beta})}{\alpha} \text{--- (2)}$$

$$\text{And} \quad LNK = \frac{LN(Q/\gamma/L^{\alpha})}{\beta} \text{--(3)}$$

Continue solution too it has

$$\alpha = \frac{LN(Q/\gamma/K^{\beta})}{LNL} \text{--(4)}$$

$$\beta = \frac{LN(Q/\gamma/L^{\alpha})}{LNK} \text{---(5)}$$

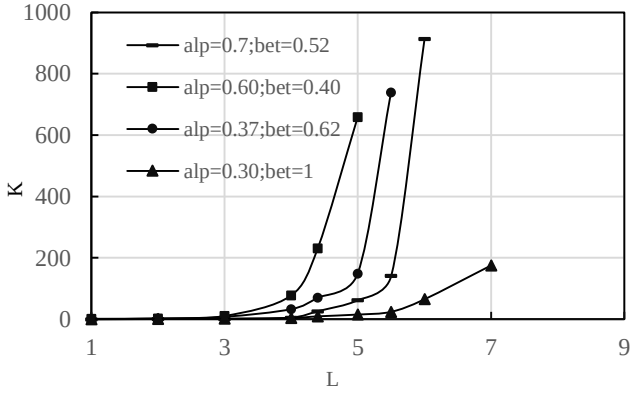

Figure 1 the relation of L-K under different α &β

3. Discussion

Figure 1 shows that two curves of K and L with α&β respectively. When α is 0.6 &β=0.4 the K becomes high which explains high capital to be needed under the same labor. Such as when the labor is 4.4 the K is 230 yuan and 60yuan under α= 0.37&β=0.62. It explains that α is main parameter to control K and β is inferior. This is a conclusion acquired in this paper. At the condition of α= 0.3 &β=0.98, the K will be the least meantime the labor increases. In general, α >β effective turn is observed in this paper. That means that high α will lead high K than β. The α increases leads K become high, meantime the β increases L become high which means the people increase who increase variable capital. That Q changes from 1 to 20 and γ=11 is chosen.

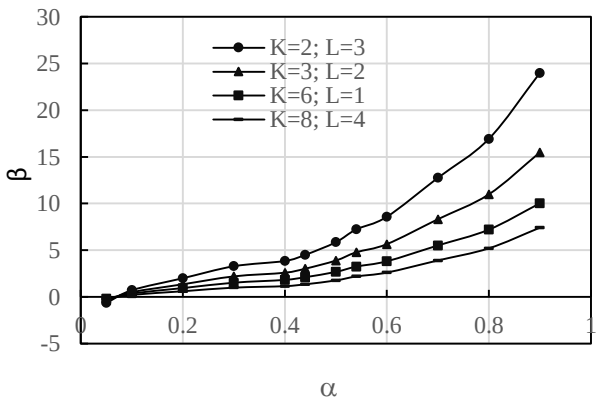

Figure 1 the relation of α &β under different L, K Figure 2 explains that α&β relation is increasing proportion. As shown in Figure 2（a）the trend is a polynomial line at parameter K=2 and L=3. When α is 0.1 β is 1 while α increases to 0.8 β attains 16. In Figure 2 generally the turn of effective size is α> β. another find is through K change it is observed that if K increases β will decrease; the same way to former if L decreases β will increase. The effective turn is in general K>L under curves in Figure 2. This is an acquired conclusion too in this paper.

4. Conclusions

1. It may be the α >β effective turn to Cobb-Douglas Q is found from labor & capital relationship in this paper. .
2. In general the turn of effective size is K> L from α and β curve. Another proof is the same as above 1 α >β is the effective turn too here.

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