

The Trend between Parameters and Quantity at Cobb-Douglas Function & Total Product Relationship with Different Parameters under the Best Capital & Labour in Microeconomics

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Abstract: - With regards to the parameters labor&capital elasticity and technological parameter at Cobb-Douglas function the detail study is done in this paper. It is found that the α decreases when quantity inclines within 10~20 according to modeling in 2. Meantime, the β increases with increasing commodity quantity from -0.3 to 0.1 in here. The γ declines from 10 to 6 within it. The α increases slightly when quantity inclines within 1~9. The value here is not good we supposed that the three conditions are too little. Meantime, the β decreases slightly with increasing commodity quantity here. The γ maintains a constant one about 10 within it. The lowest point is 12 for γ and β and the highest point is 16 for α according to simulation. So the best scope is quantity from 12 to 16. it is found that the total product will incline when labour increases. The total product will decline when capital price increases. Meantime the total product will decline when capital price increases.

Keywords:- trend, parameters, commodity quantity, capital, Cobb-Douglas function; total product; relationship; the best labour and capital; microeconomics; labor; total cost; capital price

1 Introduction

The parameters is important at Cobb-Douglas function since they affect the cost value in calculation. In this study it is investigated that detail parameters trend with commodity quantity within quantity of 10 to 20 and found that they are changed with quantity at a certain rule. ^[1~3] this is benefit to later preparation for further use to calculate all kinds of cost. As we know the three parameters is significant in microeconomics. The benefit maximum is supposed so the economist can build perfect theoretical model to study all kinds of problem in micro economy. ^[3] The err must be controlled strictly to its function so that this is important evaluation. The coefficient determination of fitting function R^2 will be evaluated to judge its precision for further study. It is to promote practical

Guide in reality society for estimating every kind of respect at corporation. In the management of scientific model it is available to wield its role for the most benefit.

The relationship between total product and different parameters is important in cost calculation in microeconomics. Because the best labour and capital is calculated in terms of relational equations. The status is expressed through relationship drawing to study their internal connection. ^[3] Under this best condition the parameter is the best important this paper will draw the curve and observe their relationship. As we knew the Cobb-Douglas function in economics is very renowned but the detail parameters are not yet clear. In this paper labor, total cost and capital price are searched to find their rules.

2 The economics modeling to three parameters

The Cobb-Douglas function is

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

Production quantity Q; γ is technique coefficient; α is producing labour; β is capital elasticity. It has

$$LN\gamma = LNQ - \alpha LNL - \beta LNK \text{ ---- (2)}$$

Due to equation (2) it obtains

$$LN(Q_1 / Q_2) = \alpha LN(L_1 / L_2) + \beta LN(K_1 / K_2) \text{ ---- (3)}$$

Here, subscript 1 and 2, 3 is three coordinate.

$$LN(Q_2 / Q_3) = \alpha LN(L_2 / L_3) + \beta LN(K_2 / K_3) \text{ ---- (4)}$$

α is solved in terms of (3) it can be gotten

$$\alpha = \frac{LN(Q_1 / Q_2) - \beta LN(K_1 / K_2)}{LN(L_1 / L_2)} \text{ ---- (5)}$$

And $\alpha = \frac{LN(Q_2 / Q_3) - \beta LN(K_2 / K_3)}{LN(L_2 / L_3)} \text{ ---- (6)}$

In terms of above equation it can be gotten

$$\beta = \frac{LN(Q_1 / Q_2)LNL_1 - LN(Q_1 / Q_2)LN(L_1 / L_2)}{LN(K_1 / K_2)LNL_1 + LN(K_1 / K_2)LN(L_1 / L_2)} \text{ --- (7)}$$

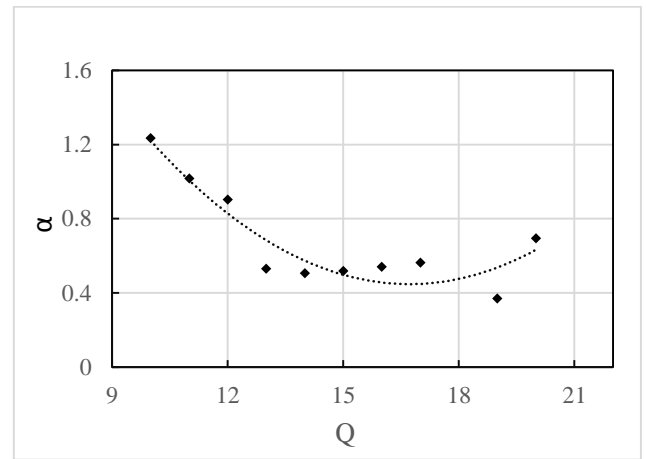
$$\beta = \frac{LN(Q_1 / Q_2)LN(L_1 / L_2) + LN(Q_2 / Q_3) - LN(Q_1 / Q_2)}{[-LN(K_1 / K_2) + LN(K_2 / K_3)]LNL_3 + LN(K_2 / K_3)} \text{ --- (8)}$$

From equation (2) it has

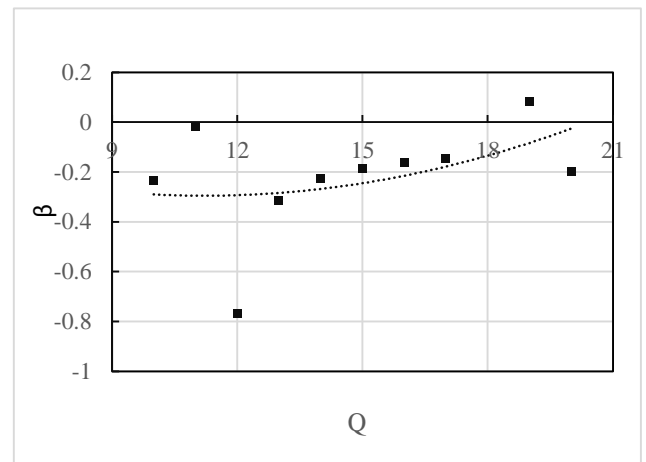
$$\gamma = EXP(LNQ - \alpha LNL - \beta LNK) \text{ ---- (9)}$$

3 Discussions

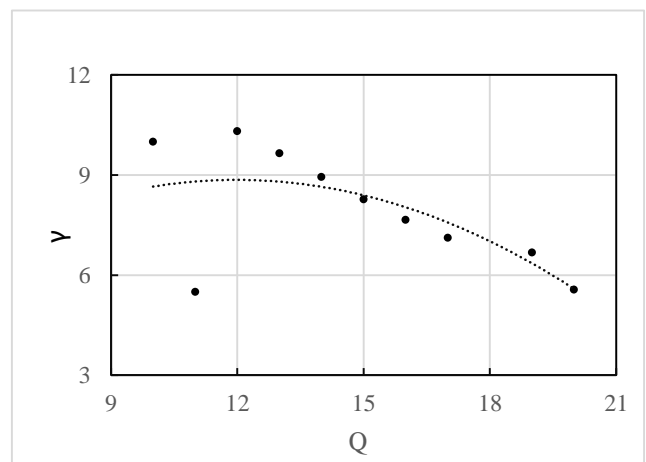
In terms of the result as above model the parameter is drawn as below figures. First figure is about 10~20 while the second one is 1~9. It is compared in detail and the condition of model is listed as last to find the difference. It is studied that clarified value will form the better parameters. Here Seoul Metal Company is used to establish parameters. For the sake of making equation of Cobb-Douglas three parameters of α , β and γ is solved to find feasibility with two groups.



(a) α



(b) β



(c) γ

Figure 1 the trend between parameters and quantity in quantity of 10~20.

As to the parameters labor & capital elasticity and technological parameter at Cobb-Douglas function the detail study is done in this study. It

is found that the α decreases when quantity inclines within 10~20 according to modeling in 2. Meantime, the β increases with increasing commodity quantity from -0.3 to 0.1 as seen in Figure 1(a~c). The γ declines from 10 to 6 within it. The lowest point is 12 for γ and β and the highest point is 16 for α in Figure 1. So the best scope is quantity from 12 to 16.

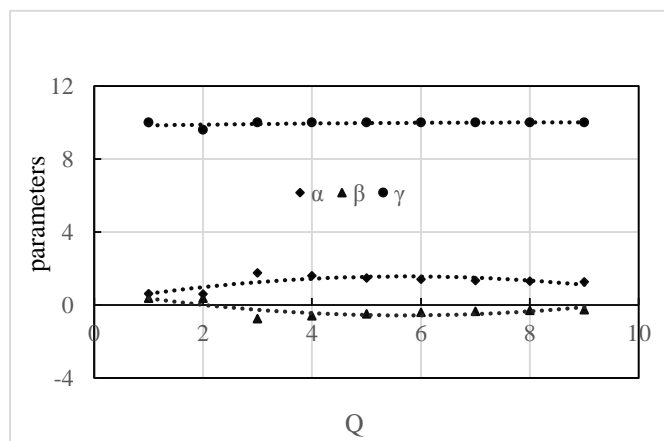


Figure 2 the trend between parameters and quantity in quantity of 1~9.

As to the parameters it is found that α increases slightly when quantity inclines within 1~9. Meantime, the β decreases slightly with increasing commodity quantity as seen in Figure 2. The γ maintains a constant one about 10 within it. The best point is 5 from Figure 2. The value here is not good because the three conditions are too little which we supposed.

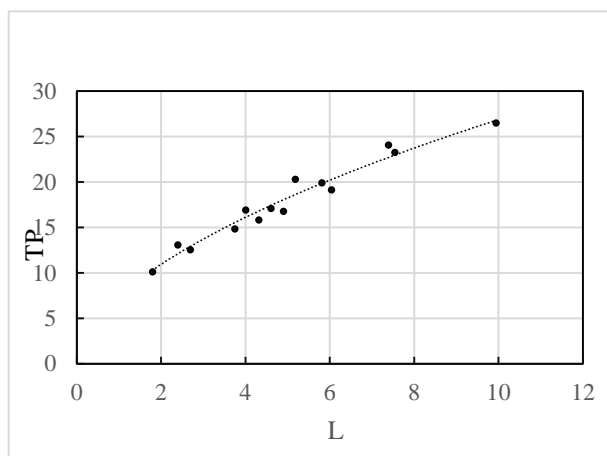
Table 1 the condition between quantity and labour & capital.

Q/m	L	K
1	0.1	0.1
2	0.2	0.2
3	0.3	0.3
4	0.4	0.4
5	0.5	0.5
6	0.6	0.6
7	0.7	0.7
8	0.8	0.8
9	0.9	0.9
10	1	1
11	2	2
12	3	3
13	4	4
14	5	5
15	6	6
16	7	7
17	8	8
19	10	10
20	13	13

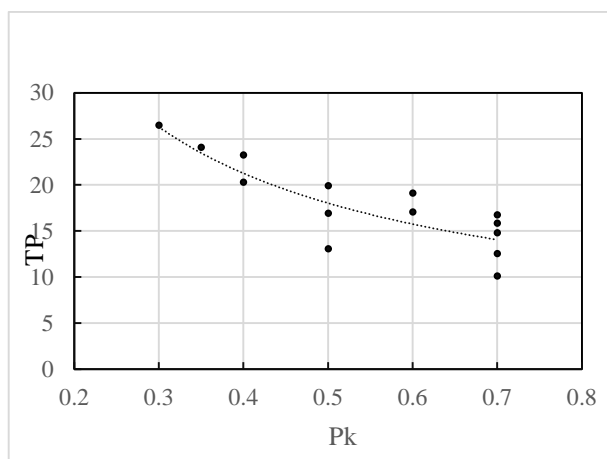
As seen in Table 1 the conditions of quantity and labour & capital are shown. Q is product

quantity per minute. Two kinds of parameters are used to study. One is from 1 to 9 and the other is

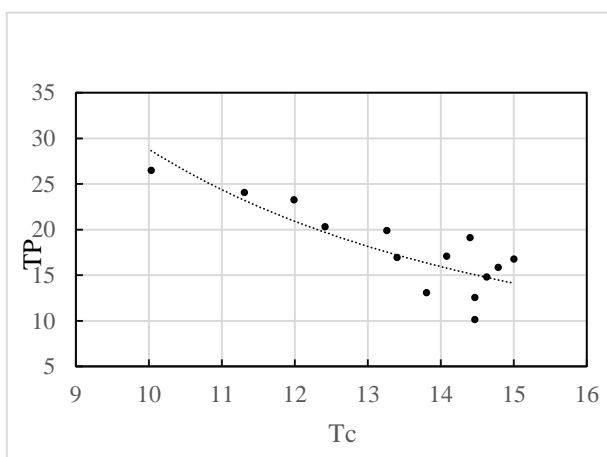
from 10 to 20. as mentioned above the former is not so good while the latter is good so the big value will be used we suggested.



(a) L



(b) P_k



(c) TC

Figure 3 the relation of TP and different parameters.

In terms of above model it is calculated the relation of drawing as Figure 3. It is found that the total product will incline when labour increases. The total product will decline when capital price increases. Meantime the total product will decline when capital price increases.

4 Conclusions

As to the parameters labor&capital elasticity and technological parameter at Cobb- Douglas function the detail study is done in this paper. It is found that the α decreases when quantity inclines within 10~20 according to modeling in 2. Meantime, the β increases with increasing commodity quantity from -0.3 to 0.1. The γ declines from 10 to 6 within it. The α increases slightly when quantity inclines within 1~9. The value here is not good since the three conditions are too little, we supposed. Meantime, the β decreases slightly with increasing commodity quantity. The γ maintains a constant one about 10 within it. The best scope is quantity from 12 to 16 according to model.

It is found that the total product will incline when labour increases. The total product will decline when capital price increases. Meantime the total product will decline when capital price increases.

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