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Review Article

The Modeling of the Biggest Total Cost and Labor in Terms of Pk and Quantity with Economics

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Abstract: The biggest total product maintains 30 piece with the labor changing.The biggest average product may decrease sluggishly from 0.45 to 0.37 MPK will decrease from 67 to 7 Yuan when the total cost is 71Yuan/min with γ=0.15 and Pk=1.5. The turn of effective factors is MPK>TP>AP>MPL for defining total cost and MPL>TP>AP>MPK for defining quantity in the biggest total product with the best L & K. The biggest average product declines from 0.25 to 0.22 with quantity increasing from 2 to 4 respectively. The biggest total cost will decrease from 0~2.2 to 0~0.8 when labor increases meantime MPL maintains a constant about 0~2.2.

Keywords: The biggest total cost; modeling; labor &capital; Pk; quantity; economics.

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1. INTRODUCTION

The forge process of hub is an automatic flow production line with expensive machine in GM workshop. This process includes three punches ie. First feeding and second press and third picking off processes in order to form the profile of hub from rod materials so it is an automatic process which completes four functions in whole manufacture. The profit is calculated through revenue and cost which is an important factor in manufacture. In this paper the revenue has been computed and drawn from their relation with cost. The total goods quantity is investigated for search their change in these processes. For the better benefit it must be studied further it can gain the profit use. Since the stability is key as for manufacture. How we can define stable and low cost parameter is significant matter. For the inference the different drawing between labor cost and quantity is made to analyze the change and low cost situation in this study. The constant labor L & capital K is defined to fit to cost value for hub forging process [1~4].

In the forge process the hub will be granted forge which is a important process to form complete profile finished good. The cost evaluation is a important one to save person and capital. So model is established that includes function of cost and quantity to solve the cheapest cost. It lets labour and capital is a independent variable to find the cheapest cost. In economics the cost may be calculated according to define different parameter so it is solved by the correspondent formula to each parameter. The establishment of fact parameter is based on the forge process only and it is found that the every cost changes in a course with independent variable. The cost is significant in economics which may draw every curve to evaluate the whole trend in quantity. Only in this way can we find the optimum path to choose and solve our cost aim. Certainly in this computation it is optimum original parameters to ensure the reality and optimum. By comparison it is found the whole data fit to well. So it is thought that the establishment is successful by this path. We can compute the formula through a certain parameter and adopt optimum resolution to obtain constant for our cost evaluation. We looks forwards to making a role in our cost and quantity calculation in this paper.

2. Modeling

For the sake of looking for the biggest total product in this paper the correspondent modeling is established which is proposed. Below is the modeling programme.[2]

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The formulas for cost control are listed as below:

$MP_L / P_L = MP_K / P_K$ ------ (1)

$TC = KP_K + LP_L$ -------- (2)

$MP_K = dTP / dK$ ------ (3)

$MP_L = dTP / dL$ ------ (4)

The Cobb-Douglas function is

$Q = \gamma L^{\alpha} K^{\beta}$ ------- (8)

Production quantity Q; γ is technique coefficient; α is producing labour elasticity; β is producing capital elasticity. K is capital; L is labour; TC is total cost; MPL is labor marginal product. MPK is capital marginal product;TP is total product; AP is average product in this study. The calculated constant is γ=0.15; α=1.15; β=0.13 respectively. Table-1 shows the parameters and average value of these three coefficients according to ten groups data with correlation equation.

Table 1: The conditions of original parameters and coefficient

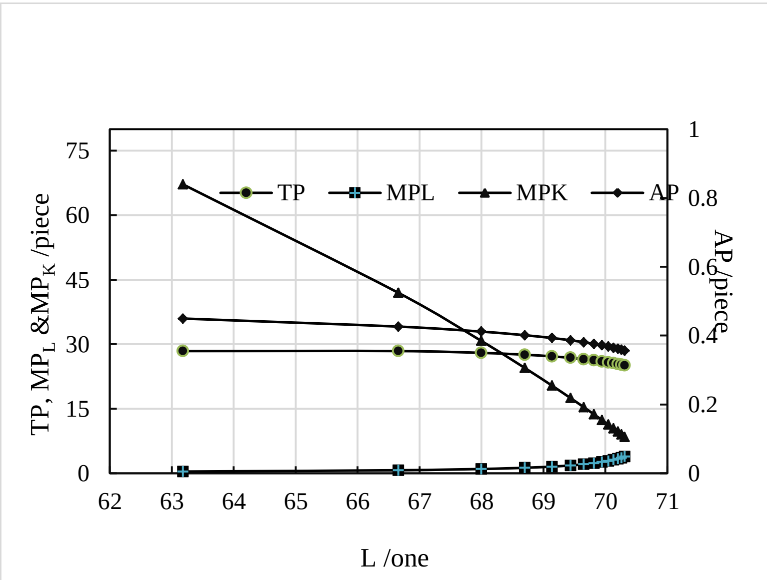
Parameters No.	L /One	K /Yuan	Q/m	α	β	γ
1	1.5	1.5	0.22	1.41	-0.41	0.15
2	2	2	0.3	1.41	-0.29	0.15
3	2.5	2.5	0.37	1.29	-0.22	0.14
4	3	3	0.45	1.22	-0.18	0.14
5	3.5	3.5	0.52	1.18	-0.15	0.14
6	4	4	0.6	1.15	-0.13	0.14
7	4.5	4.5	0.67	1.13	-0.12	0.15
8	5	5	0.75	1.12	-0.11	0.15
9	5.5	5.5	0.82	1.11	-0.10	0.15
10	6	6	0.9	1.10	-0.09	0.15
Average	-	-	-	1.15	-0.13	0.15

3. DISCUSSIONS

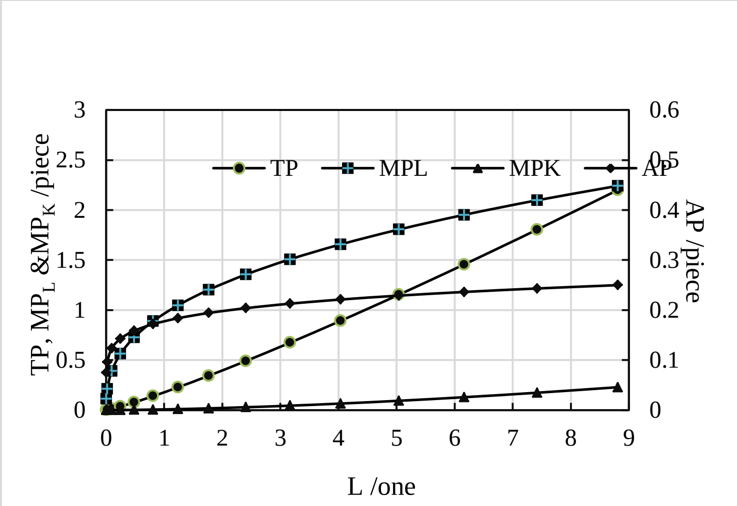
In Figure 1(a) the total product is 30 pieces in TC=71Yuan whilst it will increase with increasing labor. Furthermore in Figure 1(b-e) with goods quantity increasing the total product will decrease from 3 to 0.7 pieces with γ=0.15 and Pk=1.5. With the similar method the average product decreases from 65 to 1 with the labor increasing in Figure 1(a). It is neglected in the other graph with quantity due to its little value.

The biggest average product declines from 0.25 to 0.22 with quantity increasing from 2 to 4 respectively in terms of Figure 1(a~e). The biggest total cost will decrease from 0~2.2 to 0~0.8 when labor increases meantime MPL maintains a constant about 0~2.2.

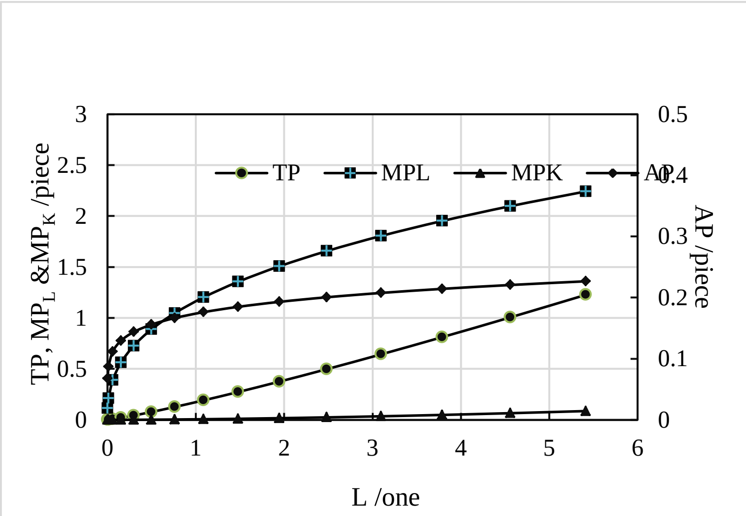
In Figure 1(b-e) Marginal product of labor will increase when increasing labor while it may maintain a certain value with curve. The quantity of labor is decreased from 13 and 4 correspondingly. The MPK is too little to be dominant so it is neglected in this paper.



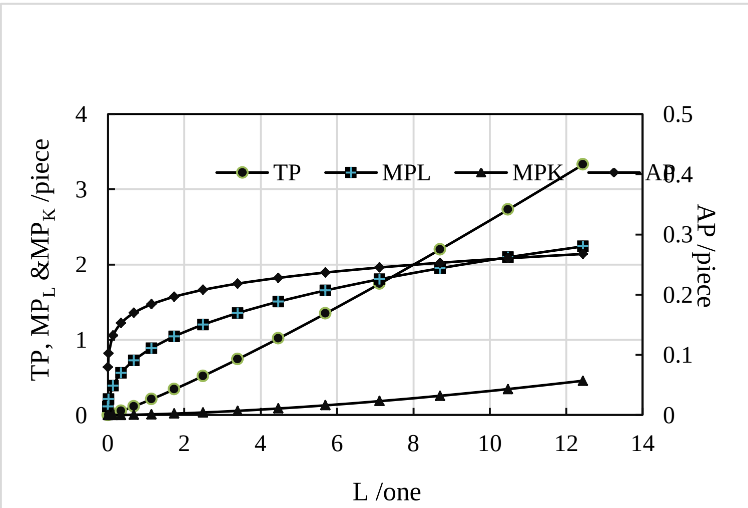
(a) Pk=0.15;TC=71Yuan/min



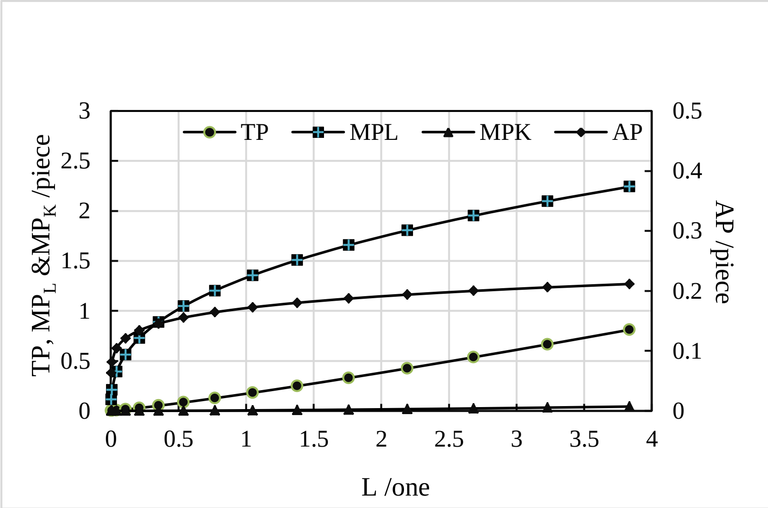
(b) Q=2pieces



(c) Q=3pieces



(d) Q=1.5pieces



(e) Q=4pieces

Figure-1: The relationship between the biggest total products and labor with γ=0.15 and Pk=0.15 & TC(a) for hub

As seen in Figure 1(a) it is found that with inclining the quantity labor the total cost will decline sluggishly. Furthermore the parameter is Pk= 0.15Yuan. The marginal product of capital will happen which will decrease from 10 Yuan、1Yuan as seen in Figure 1(a). Meantime from Figure 2(b~e) the marginal product of labor increases with the labor increasing which explains the bigger product of 2.2 pieces will be produced by us with the increasing a product of labor no matter what the labor quantity in this best status. The turn of effective factor is MPK>TP>AP>MPL for defining total cost and MPL>TP>AP>MPK for defining quantity in the least total cost with the best labor and capital.

4. CONCLUSIONS

The biggest total product maintains 30 piece with the labor changing. Average product may decrease from MPK will decrease from 67 to 7 Yuan. The turn of effective factors is MPK>TP>AP>MPL for defining total cost and MPL>TP>AP>MPK for defining quantity in the biggest total product with the best L &K.

REFERENCES

1. Compilation group of economics textbook series. (2013). Microeconomics [M], Economic Science press, 99.
2. Run, X. (2020). Modeling of Economic Cost Distribution in Thread Process of hub, Journal of Economic Science Research, 3(3), 23.
3. Run, X. U. (2020). The Trend between Parameters and Quantity at Cobb-Douglas Function & Total Product Relationship with Different Parameters under the Best Capital & Labour in Microeconomics. Social Science Learning Education Journal, 5(10), 360-365.
4. Pacific Car net (Chinese). (2019). Internet.

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