

The Longrun Cost-Commodity Quantity Drawing with K in Microeconomics

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Abstract: The longrun cost is an important factor for motor housing process in factories because of its longrun destination. The LMC inclines from 1.6 Yuan to 3 Yuan when capital K is 8 Yuan which is bad effectiveness. It is due to the inclining K. The times of LTC and LAC&LMC is 8 Yuan, 10 Yuan and 12 Yuan when the L is 25, 30 and 35 persons. The decreasing LTC is due to increasing goods quantity and labor L. Both of LAC & LMC has little decline.

Keywords: longrun cost; commodity quantity; LTC; LAC; LMC; K; L; Motor housing punch

1 Introduction

Motor house punching is an automatic flow production line with expensive machine. The longrun cost (i.e. LAC, LTC, and LMC) is an important factor in Factories. [1, 2] In this paper it will be computed and drawing of their relation i.e. The LAC, LTC & LMC and goods quantity is investigated for search their change in these processes. For the better benefit it must be studied further it can gain the most use. Since the longrun stability is key as for factories. How we can define stable and safe parameter is significant matter. For the inference the different drawing between Longrun 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 find fit longrun cost value for motor housing process.

2 Discussion

Because of Labor price $PL=0.3$; constant γ & α , β seen in [1, 2] the Longrun Cost and Commodity Quantity Drawing is calculated as below figures. Here LTC is longrun total cost; LAC is longrun average cost while LMC is longrun margin cost.

Production quantity Q is defined as below

$$f(L, K) = Q = \gamma L^\alpha K^\beta \quad (1)$$

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

$$LN\gamma = LNQ - \alpha LNL - \beta LNK \quad (2)$$

Due to equation 2 it obtains

$$LN(Q_1 / Q_2) = \alpha LN(L_1 / L_2) + \beta LN(K_1 / K_2) \quad (3)$$

Here, subscript 1 and 2 is two coordinate.

$$LN(Q_2 / Q_3) = \alpha LN(L_2 / L_3) + \beta LN(K_2 / K_3) \quad (4)$$

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

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

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

In terms of above equation it can be gotten

$$\beta = \frac{LN(Q_2 / Q_3) - LN(Q_1 / Q_2) LN(L_2 / L_3) / LN(L_1 / L_2)}{LN(K_2 / K_3) - LN(L_2 / L_3) LN(K_1 / K_2) / LN(L_1 / L_2)} \quad (7)$$

The formulas for cost control are listed as below

$$AC = TC / Q \quad (8)$$

$$MC=TC' \text{ ----- (9)}$$

$$MP_L/P_L=MP_K/P_K \text{ ----- (10)}$$

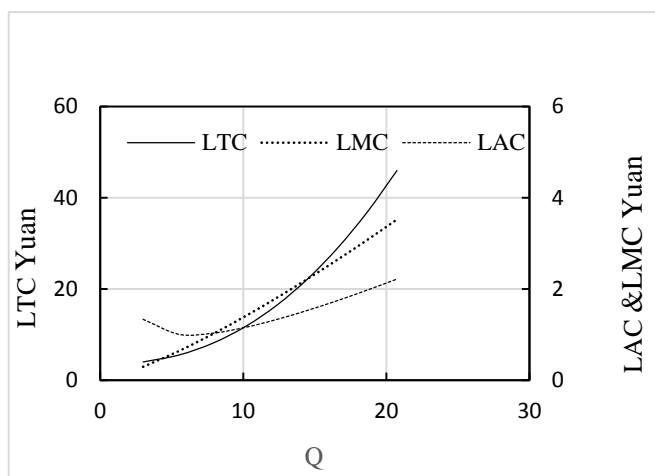
$$TC=KP_K+LP_L \text{ ----- (11)}$$

$$MP_K=dTP/dK \text{ ----- (12)}$$

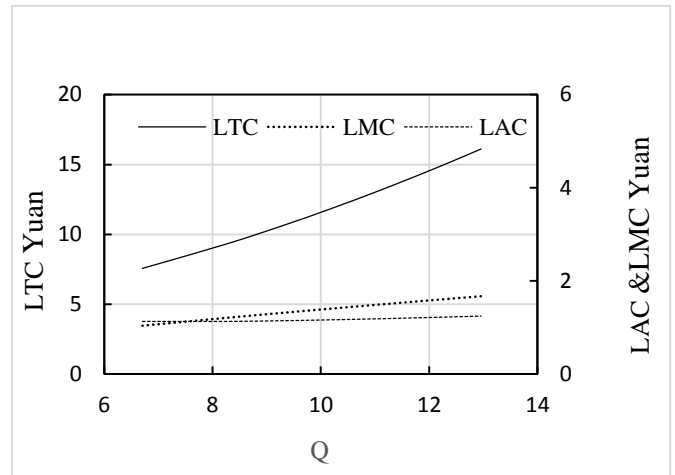
$$MP_L=dTP/dL \text{ ----- (13)}$$

$$AP=TP/L \text{ ----- (14)}$$

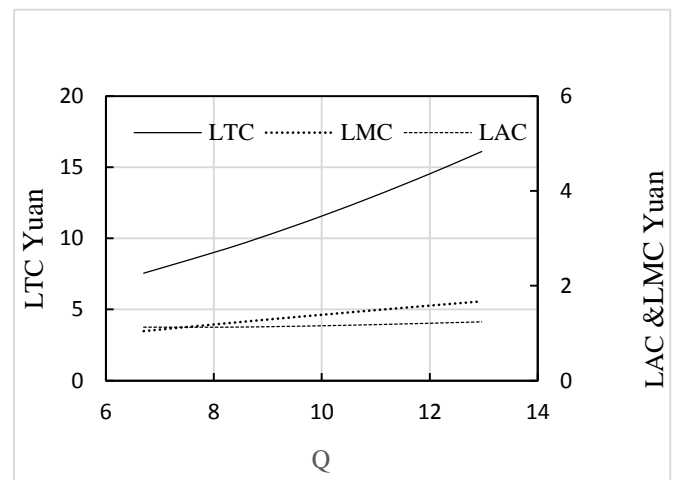
As seen in Figure 1(a) the LTC is main factor, its value is more than 6 times of sum of LAC&LMC. As seen in Figure 2(b~d) when K is constant the longrun costs show linear distribution with goods quantity. With the increasing the goods quantity these three longrun cost will incline too. The LTC is 5 times when K is 4 Yuan and 6 Yuan in (a&b) while it is 8 times when K is 8 in (c). The main inclined reason is that the LAC&LMC is constant however the LTC inclines over 2 times and this will increase the total difference when K is 8 Yuan. Here LTC is longrun total cost; LAC is longrun average cost while LMC is longrun margin cost. Moreover the LMC inclines from 1.6 Yuan to 3 Yuan when K is 8 Yuan which is bad effectiveness. Additionally the total quantity inclines from 12 pieces to 20 pieces. It is also due to the inclining goods quantity and K.



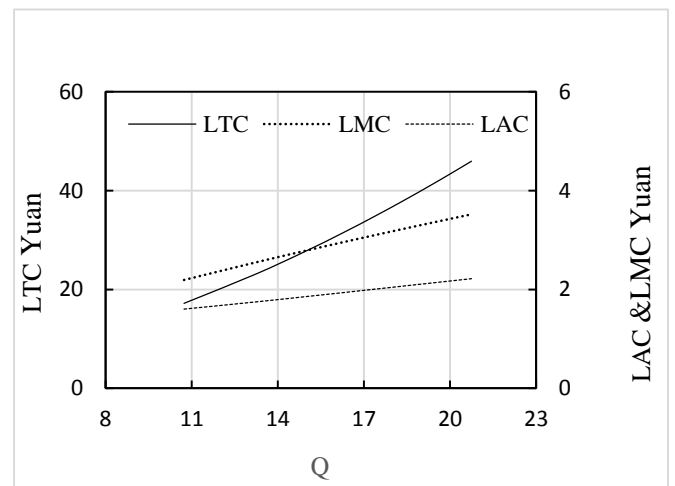
(a) $K=1,2,\dots,9; L=1,2,\dots,9$



(b) $K=4;$



(c) $K=6;$



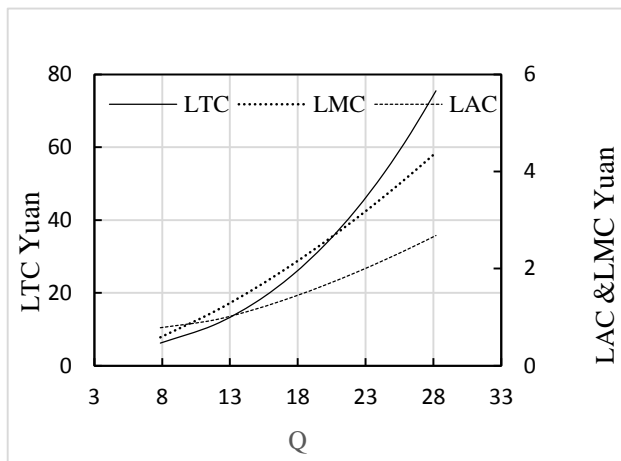
(d) $K=8;$

Figure 1 the relations of longrun cost and Q

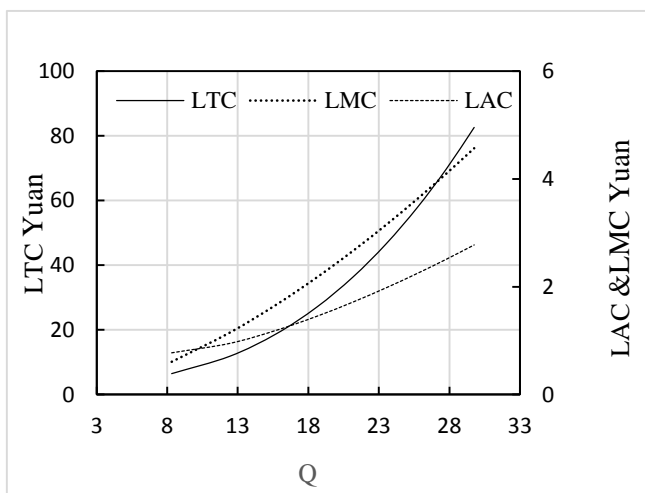
As seen in Figure 2 (a~c) with the increasing goods quantity the LTC will incline too while the other two will incline. The times of former and later is 8 Yuan, 10 Yuan and 12 Yuan when the L is 25, 30

and 35 persons. The decreasing LTC is due to increasing goods quantity and L. With the labor L inclining the LTC declines. LTC declining means total cost will decline which causes good effectiveness if there is a more control. It is needed that the LTC is main parameter so it is firstly needed check. It is big value than LMC&LAC, then check later two. Usually LAC is cost in a piece, LMC is cost increasing a piece. LMC is larger than LAC while LTC is larger than the LMC&LAC. LTC is usually several times of sum of the latter two. LAC is the second factor to estimate the cost; LMC is the third factor to estimate.

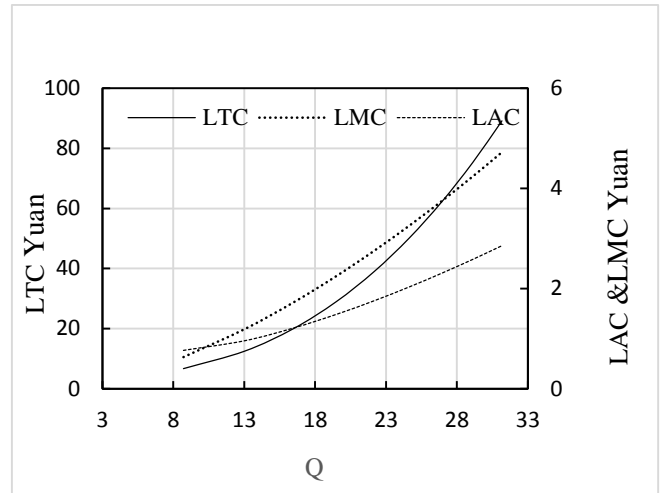
The reasonable value we can calculate is K is 8 and L is 35 as seen in Figure 1 and 2. To find these ones three figures are drawn respectively. It is found that LTC is changing big at K being 8 and the quantity is a little incline at L being 35.



(a) L=25;



(b) L=30;



(c) L=35;

Figure 2 the relations of longrun cost and Q

3. Conclusions

The LMC inclines from 1.6 Yuan to 3 Yuan when capital K is 8 Yuan which is bad effectiveness. Additionally the total quantity inclines from 12 pieces to 20 pieces. It is due to the inclining capital K. The times of former and later is 8 Yuan, 10 Yuan and 12 Yuan when the labor L is 25, 30 and 35 persons. The decreasing LTC is due to increasing goods quantity and labor.

References

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