ISSN 2664-4150 (Print) & ISSN 2664-794X (Online)
South Asian Research Journal of Engineering and Technology
Abbreviated Key Title: South Asian Res J Eng Tech

| Volume-3 | Issue-4 | July-Aug -2021 | **DOI: 10.36346/sarjet.2021.v03i04.003**

Review Article

The Modeling between Price & Cost and Quantity with New Coefficients on Economics in GM Hub Process

Run Xu*

Yantai Institute of Technology, Mechanical Electricity Dept., Yantai 264005
China Gyeongsang National University, Metallurgical Engineering Dept., Chinju 52828, Korea

***Corresponding Author**
Run Xu

Article History
Received: 10.06.2021
Accepted: 20.07.2021
Published: 27.07.2021

Abstract: GM (general motor) hub process is an important part in the whole manufacture so the modeling of its cost and quantity has been preceded. It is found that the γ is 1.2 which is fitter coefficient to hub because the price is available according to the economics cost theory. So we analyze the labor and capital to be best and find that they are labor of 7 and capital of 20. To compare them with other parts it is done that 5 and 10 respectively to look for other information. It is found that they are more available in quantity and price.

Keywords: cost and quantity; parameters; modeling; hub process; Economics; the best labor & capital.

1. INTRODUCTION

Hub process is an important one in the whole factory because the big power pressing machine is needed to press the column carbon constructional steel or aluminum alloy to a pan mode column disk. The time of pressure maintain several seconds to produce the disk ie. Hub. There are cold formation and heat one respectively. So it is demanded that the hub process is modeled to establish fit simulation to evaluate their function and cost decreasing problem in terms of regulating necessary parameters to find the quality and cost matters. According to the establishment of correspondent equation the revenue is fitted and satisfactory with the main parameter γ. detail narration is as below [1-3].

Now it is expressed that carbon steel hub advantage is process simple and cost decreasing & metal fatigue resistance is strong. But its disadvantage has been facade ugly, big weight; big inertia resistance, dispersion heat capacity and easy rust. The aluminum alloys is based on Al foundational material and add some metal elements like Mn, Mg, Cr and Ti. It has little weight so cost is low. Its can increase dispersion heat ability in terms of forming function so it can increase the tire life [4].

In general the new coefficient is deduced according to the virtual status. For the sake of price and cost consistency it is used to establish equation to check the two factors difference to ensure the consistency. The best labor and capital is solved in terms of coefficient and then establish correlation among them to define the revenue for these process. Meantime the professor and engineer are suggested to provide neglect side to improve the wheel hub profit from economy and engineering suggestion.

2. Modeling economic equations

The modeling equation is used to solve three coefficients special γ value with high mate piece. So as to make the revenue and cost consistency the low one is adopted to prevent from the lower cost. It will decrease the revenue. So after considering many factors 1.2 that is used to define γ while α and β maintain constant.

The Cobb-Douglas function is

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

Copyright © 2021 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

Production quantity Q; γ is technique coefficient; α is producing labour elasticity; 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

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

In terms of above equation it can be gotten

$$\beta = \frac{LN(Q_1/Q_2)LNL_1 - LN(Q_1/Q_2)LN(L_1/L_2)}{LN(K_1/K_2)LNL_1 + LN(K_1/K_2)LN(L_1/L_2)} \text{ ---(6)}$$

From equation(2) it has

$$\gamma = EXP(LNQ - \alpha LNL - \beta LNK) \text{ ----(7)}$$

The formulas for cost control are listed as below

$$TC = FC + VC \text{ ------(8)}$$

$$AVC = VC/Q \text{ -----(9)}$$

$$AFC = FC/Q \text{ -----(10)}$$

K is capital; L is labour; TC is total cost;VC is variable cost. AC is average cost; AFC is average fixed cost; AVC is average variable cost The calculated constant is γ=1.2; α=1.12; β=-0.12 respectively. The parameter P_l=20Yuan and P_k= 5Yuan. In terms of 108Yuan per minute 50~62 Yuan/piece is defined so use ATH and ATL represents average high turnover and low one respectively. The detail narration is expressed as below.

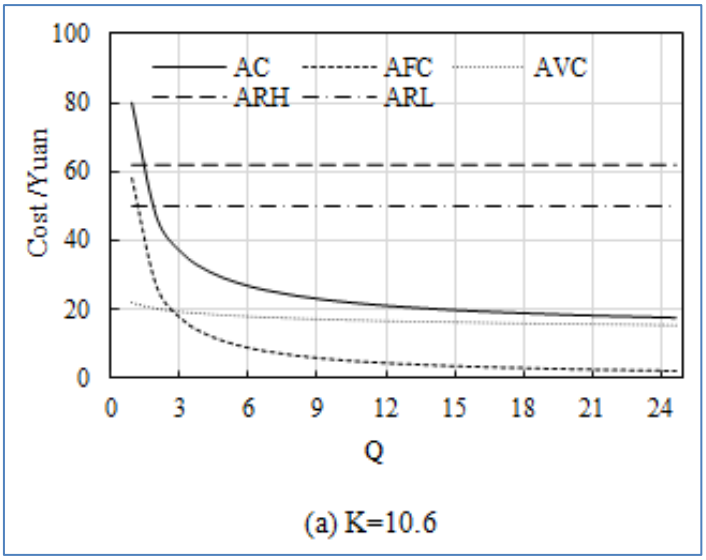
Table-1: The conditions of original parameters and coefficient

Parameters / Value	l	K	Q,/m	α	β	γ
1	0.4	0.4	0.48	1.41	-0.29	1.70
2	0.5	0.5	0.6	1.29	-0.22	1.34
3	0.6	0.6	0.72	1.22	-0.18	1.25
4	0.7	0.7	0.84	1.18	-0.15	1.23
5	0.8	0.8	0.96	1.15	-0.13	1.21
6	0.9	0.9	1.08	1.13	-0.12	1.21
7	1	1	1.2	1.12	-0.11	1.20
8	1.1	1.1	1.32	1.11	-0.10	1.20
9	1.2	1.2	1.44	1.10	-0.09	1.20
10	1.3	1.3	1.56	1.09	-0.08	1.20
Average	-	-	-	1.12	-0.12	1.21

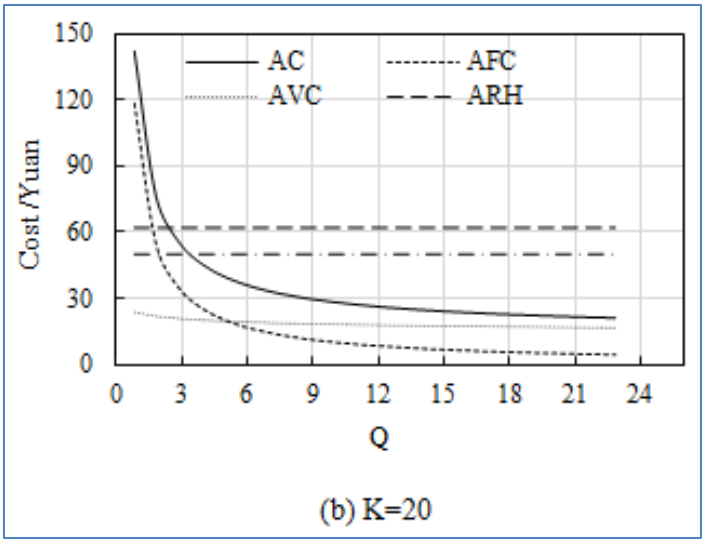
3. DISCUSSIONS

The Modeling is established and it is found that they are fitter GM hub product. The revenue is finer that says the γ=1.2 is fit one for hub price. The best labor is 7 whose quantity is finer than 5 that says that more quantity is included here in Figure 1(a~e). The best capital is 20 whose revenue is better than 10 that says that more price will be formed in the former.

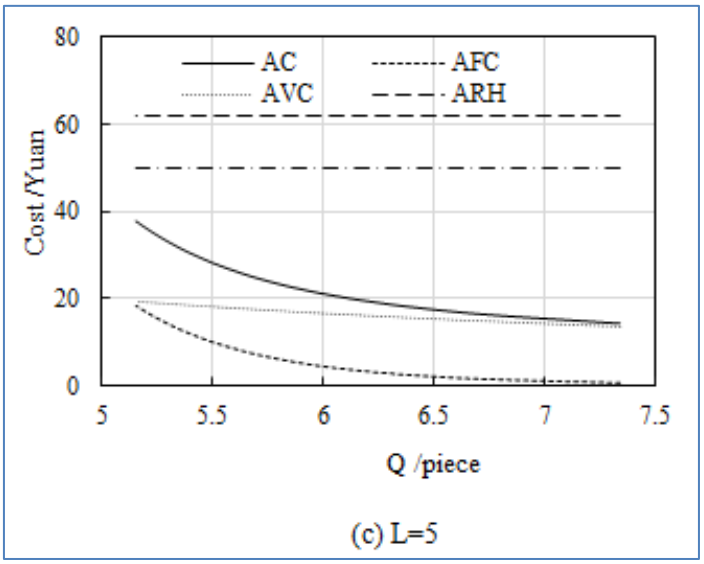
In Figure (a~e) Pk=5 & Pl=20 and ARH=62Yuan &ARL=50 Yuan is the condition for linking the revenue and cost. The former is capital and labor price and the later is revenue including high average revenue (ARH) and low average revenue (ARL) value.



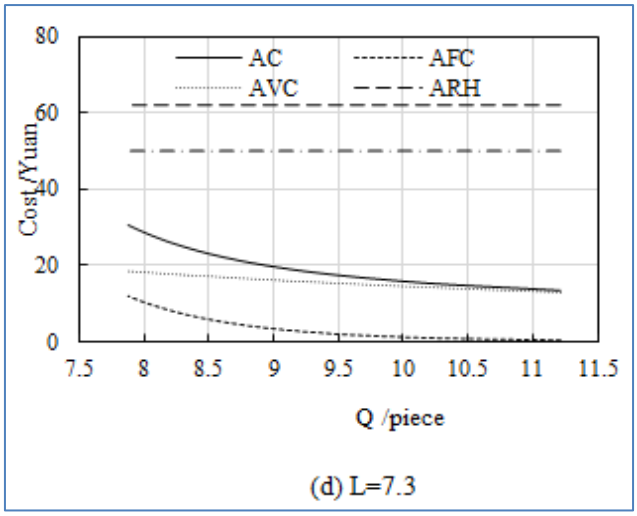
(a) K=10.6



(b) K=20



(c) L=5



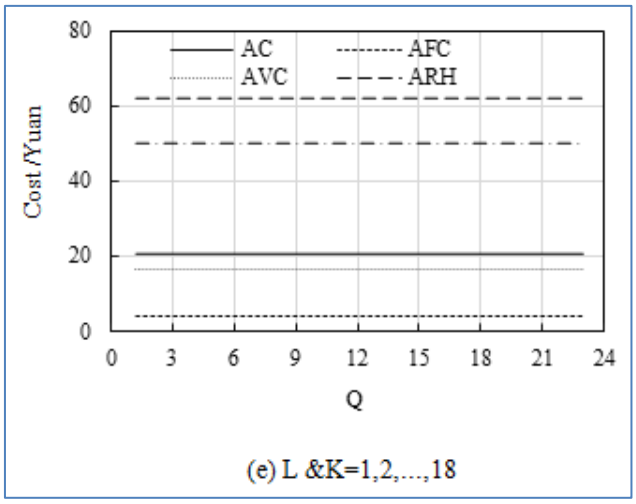


Fig-1: The graphs of cost and quantity with L &K and Pk=5 & Pl=20 and ARH=62Yuan &ARL=50 Yuan in GM hub process

For the sake of price and cost consistency it is used to establish equation to check the two factors difference to ensure the consistency. If γ is big then the cost will incline on the contrary if it is small then the cost will decline. So we don't increase the labor effect only and don't mate a little labor for the process. As for the high cost price the labor will be promoted to make sure the fundamental labor quantity. In the Figure 1(c&d) the 4 and 5 pieces are predicted to be the turnover intersection as labor changes from 5 to 7.3 labors respectively. Meantime in Figure 1(e) there is not intersection when labor and capital increase from 1step to 18 therefore this is an ideal status that means that in anyway only if the ARL is bigger than AC the profit may be produced. It explains that the AR is higher than 20 Yuan of AC that is ok.

4. CONCLUSIONS

The Modeling is established and it is found that they are fitter GM hub product. The revenue is finer that says the γ=1.2 is fit one for hub price. The best labor is 7 whose quantity is finer than 5 that says that more quantity is included here. The best capital is 20 whose revenue is better than 10 that says that more price will be formed in the former. The turnover intersection is 3~4 pieces which explains only if the AR is bigger than it the profit will be formed.

REFERENCES

1. Compilation group of economics textbook series. (2013). Microeconomics [M], Economic Science press, 99
2. Run, X. U. (2020). Modeling of Economic Cost Distribution in Thread Process of hub, Journal of Economic Science Research, 03(03); 23
3. Xu, F., Huang, Y. (2017). New Manual of Metall Materials, An Hui Technology & Science Press, 130
4. Pacific Car net (Chinese). (2019). Internet.

CITATION: Run Xu (2021). The Modeling between Price & Cost and Quantity with New Coefficients on Economics in GM Hub Process. *South Asian Res J Eng Tech*, *3*(4): 124-127.