

## The Modeling of Car Cost & Revenue and Best Profit in Manufacturer on Economics

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**Abstract:** The relationship between revenue and cost is established to find the intrinsic nature with integrated Cobb-Douglas function. It is found when the best labour is 98 the cost is low and the number of cars are 1.1 with the best profit intersection of 41 thousand Yuan which is best profit point with integrated method. When the best capital is 498Yuan the profit point is 1.1 of the number of cars with the 40 thousand Yuan too. The intersection of pieces and value between profit and cost attains 0.9 and 1.16 pieces with 32 and 41 thousand Yuan at the best capital and labor respectively. This is the important one in the course of profit. It is transferring the start and end point. Generally this point is regarded the best profit begins and may be chosen as the best profit. Meantime in the scope of  $P_{AA}$  and  $P_{AC}$  it has  $0 \leq Aprofit \leq AC$ ,  $P_{AC}$  and  $P_{AR}$  it has  $AC \leq Aprofit \leq AR$  and  $\geq P_{AR}$  it has  $Aprofit \geq AR$ . So the best profit has been accessed  $P_{AR}$  the average profit is bigger than AR ie.  $Aprofit \geq AR$ . It is the last one mentioned above if manufacturer has enough investment capital and technique workers. The Cobb-Douglas Function has been a limited for example the the precision matter that makes the modeling a certain thing.

**Keywords:** Modeling; cost; cars; revenue; best profit; manufacturer; economics.

### 1. INTRODUCTION

The revenue product is a behavior with investing certain money and requiring revenue from investment and product in market. This process includes sale product in order to form the profile of product so it is a process which completes this function in whole process. The profit is calculated through revenue and cost is an important factor in this process. In this paper the revenue has been computed and drawn from their relation with cost. The revenue  $AC$ ,  $AVC$  &  $AFC$  and product is investigated for searching 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 this procedure. How we can define stable and low cost parameter is significant matter. For the inference the different drawing between profit 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 this process.

The least total cost and the biggest total product has an important role with the quantity & labor. Because the least one is evaluate the cost per labor under the best labor and capital on economics. If the

cost is big it will increase cost burden. Only if the least cost can decrease the cost price and the reasonable choose may be used in determining the total cost. Because of its availability it may be chosen for other factor such as the random price promotion. In this paper the revenue is adopted from higher value to check the piece and the cost value. So as to higher revenue the low cost value and low pieces is necessary. For the sake of the least total cost the best labor and capital has been established firstly and then determined the least total cost equation with quantity and labor [1-5].

In this study the integrated Cobb-Douglas function is adopted to solve the whole field of profit curve in order to observe the best profit and piece change to dig the deep relationship between them. It is found that the good relationship exists in them no matter how the condition may be changed. It is available to solve the best profit matter which distresses us many years with the Cobb-Douglas function to compute the technical problem. In many field the exponential function has been a certain role in calculating the important technological function. But due to the complication the precise may be met serious

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challenge. Now the precise may be less than the prediction the good result is gained by us in this paper. The erroneous investigation needs to be checked again to adopt it for us to solve in further research. Our destination may be the search the erroneous degree and correct scope to meet its calculation demand in future. For example the Cobb-Douglas function sometime loses its virtual value with logicity become another one. Those need to be searched again and find the error cause to further utilization better. The related profit has been analyzed according to their functions of integrated transfer. The biggest efficiency results are concluded as in this study and detailed data content is stated as below later discussions. Up to now all of the efficiency is clarified in terms of the different scope between all of turning points. So it is judged that the detailed value in each piece for goods is been clarified according to this data. This function may apply to all of goods for company and consultant which has been significant thing.

## 2. MODELING AND DISCUSSIONS

The modeling of car has been established according to modeling with economic equations that has a certain role in stock market. So Cobb-Douglas function is used to complete the modeling.

The detail establishment and modeling is as related literature.

The Cobb-Douglas function is

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

Here Production quantity Q;  $\gamma$  is technique coefficient;  $\alpha$  is producing labour;  $\beta$  is capital elasticity. K is capital; L is labour; AFC is average fixed cost; AVC is average variable cost; AR is the average revenue; TR is total revenue. The calculated constant is  $\gamma=0.02$ ;  $\alpha=1.2$ ;  $\beta=-0.26$  respectively. Since

$$AC = dTC/dQ = P(Q/\gamma)^{1/\alpha-1} \cdot 1/\alpha \cdot K^{-\beta/\alpha} \text{ -----(2)}$$

Because

$$AProfit = \int (AR - AC)dQ = AR \cdot Q - P(Q/\gamma)^{1/\alpha} \cdot \gamma^{1-1/\alpha} \cdot K^{-\beta/\alpha} \text{ -----(3)}$$

It has

$$TProfit = AProfit \cdot Q \text{ -----(4)}$$

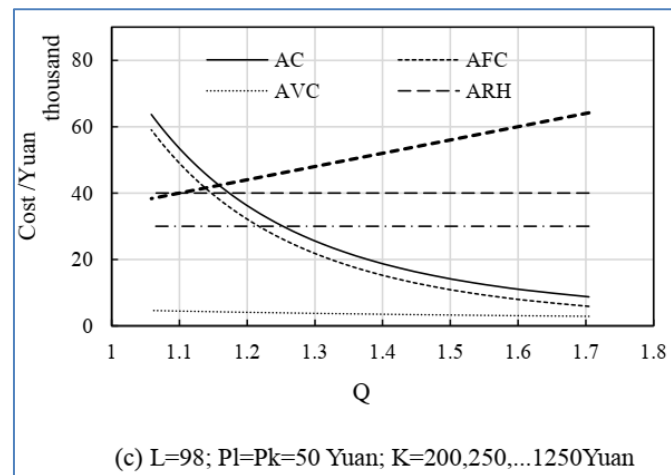
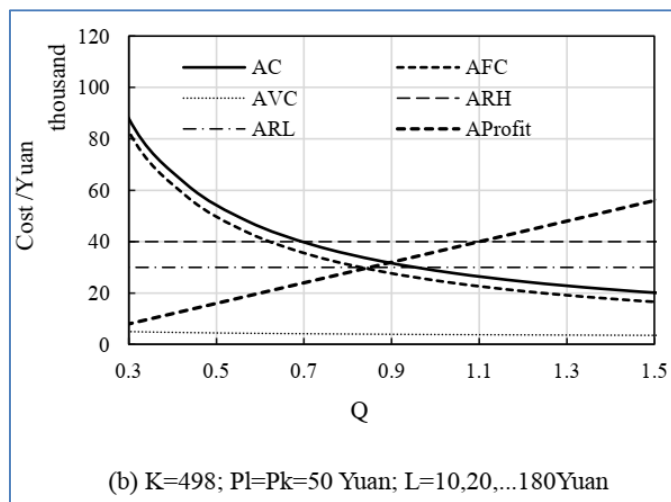
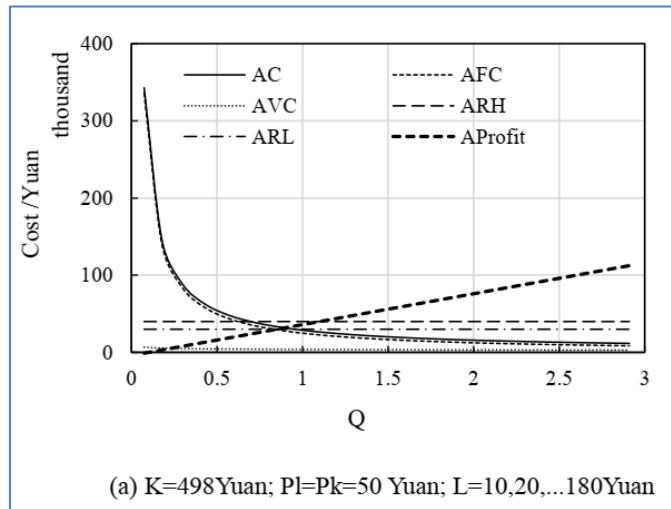
The parameter  $P_l$  is labor price and  $P_k$  is capital price. It is supposed that former and later one is 50Yuan. profit is in terms of 50Yuan Q is piece of product. TC is total cost; Aprofit is the average profit; Tprofit is the total profit. The parameter of constant value with labor and capital & quantity may be seen literature. It is chosen that 10groups value to acquire

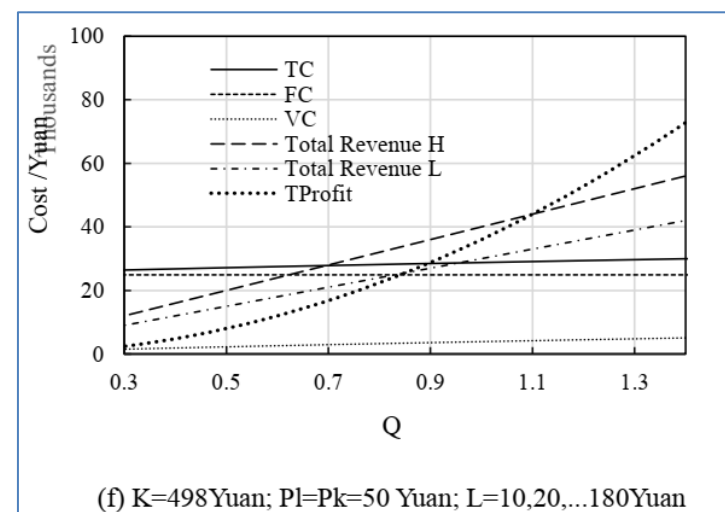
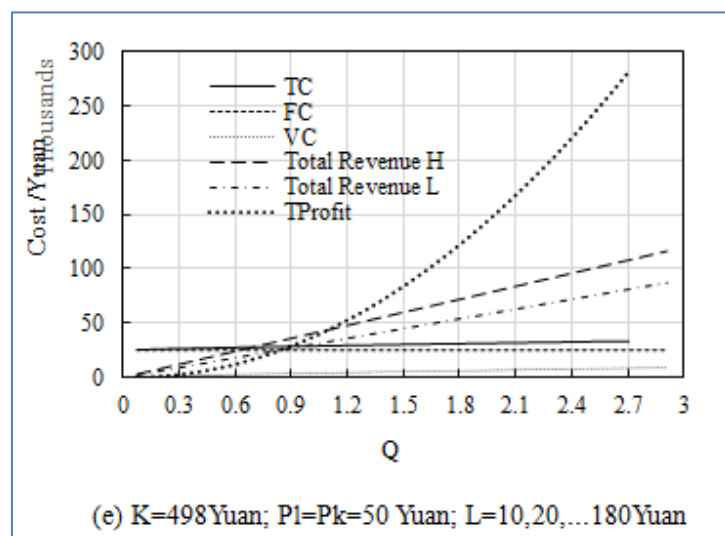
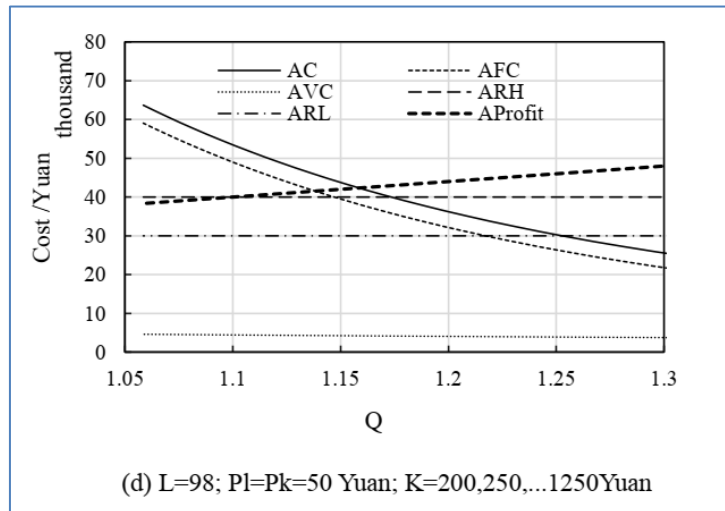
average ones. The detail narration is expressed as below.

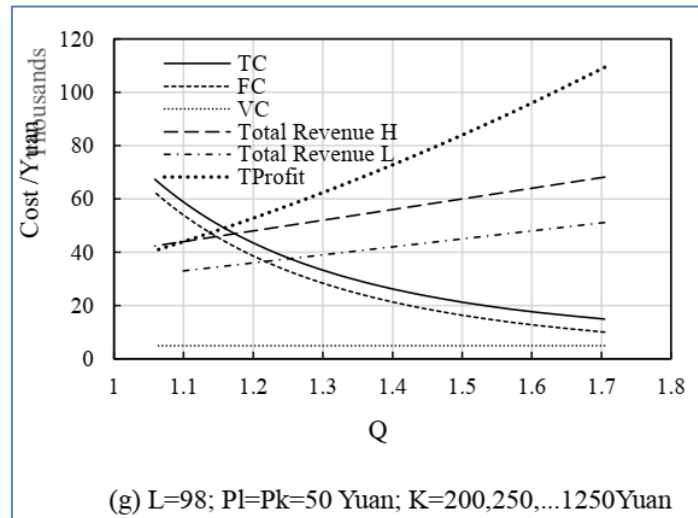
It is found when the best labour is 98 the cost is low and the number of cars are 0.9 with the intersection of 30 thousand Yuan which is profit point from Figure 1(a~b). When the best capital is 498Yuan the profit point is 0.9 of the number of cars with the 30 thousand Yuan. So the balance value is 30~40 thousand Yuan which could be satisfactory with both situations because the average revenue can't be intersected with average cost line in the case of the best labors. It is regulated that the capital and labor price is from 50 Yuan to 500Yuan both in Figure 1(a) so the intersection is formed.

As seen in Figure 1(a~g) the average profit meets 0.9 with average curve and it meets 30 thousand with the average curve respectively. It means that only if excess these points the best profit which subtracts the deficit will be formed the more value excesses these points the more profit will be produced. Meanwhile the total profit will be bigger than average profit. If it has bigger revenue and less cost the best profit may increase. The difference of them is bigger the bigger best profit will be obtained. Figure 1(b&d) is the multiple part and it may be detailed and observed carefully to see the best profit trend with 498 Yuan capital and 98 labors respectively. It is concluded that the Profit point is named as P as seen in Figure 1(b,d&f) may be observed whose value is about 40 thousand. It expressed that the better consistent with above three amplitude graphs by integrated from Cobb-Douglas function. Meantime the best profit value has been also defined as this value of 40 thousand and 1.1 pieces. It is evident that the method is available and very precise. So for the sake of best condition it is feasible to with this function to solve the best profit condition under best labor and capital. According to three coefficients ie.  $\gamma$ ,  $\beta$  and  $\alpha$  and best condition with Cobb=Douglas function the best profit point may be solved. If the piece and revenue amount excesses this quantity the better profit may be obtained because they are the total profit ie  $Aprofit = \int_0^q (AR - AC)dQ$  with this point. We can gain the 42 thousand at least in this P point. Tprofit is bigger than this the larger profit can be made in this study.

On the other side the intersection between profit and cost is transferring point of profit. Here  $Aprofit = AC = \int_0^q (AR - AC)dQ$  so  $\int_0^q AR = AC + \int_0^q ACdQ$ . it is the course of profit to be formed. According to Figure 1(b,c &f) the pieces is 0.9 and 1.16 with the best capital and labor and the value of profit is 32 and 42 thousand respectively.





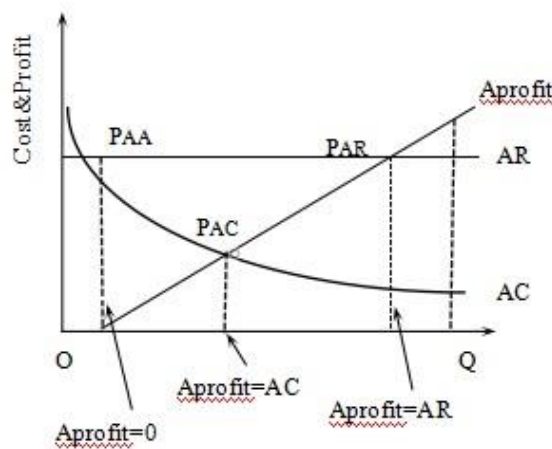


**Fig-1: The relationship between cost and number of cars & AR=4000Yuan in one minute**

As seen in Figure 1(e&g) the total profit may increase when the quantity increases. The total profit curve and total cost may intersect at 0.9 and 1.15 pieces. This is the profit point which.

Means that once the value of total profit exceeds this point the best profit may be acquired. it

will produce the best profit subtracting the loss of cost due to quantity deficit. On the other side the value is not different with the  $P_k=50$  and  $P_l=50$  under capital and labor difference from  $L=10,20,\dots,180$ Yuan to  $K=200,250,\dots,1250$ Yuan. It expresses that the common property is still the same as no matter what they are.



**Fig-2: The graph between cost and quantity with Aprofit, AR and AC.**

In Figure 1(a~c) it is expressed that the profit will increase from 0 to 120 thousand with the pieces increasing from 0 to 3 with the best capital. The one may be from 0.3 to 60 thousand with the piece is from 0.3 to 1.5 in amplified Figure 1(b). Meantime it increases from 40 to 60 thousand when the piece increases from 1 to 1.7 piece the profit may attain 40 to 62 thousand Yuan with the best labor. The one may be from 38 to 49 thousand with the piece is from 1.05 to 1.3 in amplified Figure 1(d).

In general the profit will intersect with AR and AC so it is benefit to us if the profit point is big. The biggest product profit will be in the condition of

intersection between profit and AR. The bigger one may be the condition of intersection between profit and AC. In Figure 2 the points have been shown, the three functions is Aprofit, AR and AC. The three main points are  $P_{AA}$  named as absolute Aprofit called as average profit,  $P_{AR}$  and  $P_{AC}$ . In the points of them they are absolute average profit=0, Aprofit=AC and Aprofit=AR while in the scope of  $P_{AA}$  and  $P_{AC}$  it has  $0 \leq \text{Aprofit} \leq \text{AC}$ ,  $P_{AC}$  and  $P_{AR}$  it has  $\text{AC} \leq \text{Aprofit} \leq \text{AR}$  and  $\geq P_{AR}$  it has  $\text{Aprofit} \geq \text{AR}$ . The 1.1 and 40 thousand is the  $P_{AR}$  point any pieces excess 1.1 that says that  $\text{Aprofit} \geq \text{AR}$ . Meanwhile the 0.9 and 30 thousand is the  $P_{AC}$  point any pieces exist in the two  $P_{AC}$  and  $P_{AR}$  points may produce  $\text{Aprofit} \geq \text{AC}$ . In the end 0.1 and 35

thousand is the  $P_{AA}$  point that means that the one exceeds it may produce  $Aprofit \geq 0$ . As seen in Figure 2 the all of the three points which exists in the scope of them may form different one. When the pieces increase the average profit may be larger. The efficiency and profit turn is  $P_{AR} \geq P_{AC} \geq P_{AA}$ . The best efficiency is 1.1 pieces and 40 thousand which lies in PAR point any investment that is larger than it will gain bigger efficiency than 40 thousand Yuan. If its investment is increased to 1.1 pieces each minute the accompanied device, person and investment is huge because the 0.25pieces is usual situation per minute. They are near 4 times device and person investment so it is needed careful thought and decision. It is proceeded in other study for the limited investment for consultant and company. So the better one is between  $P_{AA}$  and  $P_{AC}$  whose piece is from 0 to 0.9 pieces and whose efficiency is from 0 to 30 thousand Yuan each minute. The precise error isn't checked yet, the 0.9 pieces somewhat big for company. If it is decreased to a low one for example 0.5 etc. It may apply to reality but now we can't judge its precise and error. So it is theory model according to Cobb-Douglas Function ultimately.

### 3. CONCLUSIONS

The relationship between profit and cost has been established to find the profit and piece. It is found the 1.pieces is the best one at best labor of 98 and capital of 498 Yuan & profit of 40 thousand Yuan. Meantime 0.9 and 1.16 pieces is the course profit point with 30 and 42 thousand Yuan profit at the best capital and labor respectively.

The profit will increase from 0 to 120 thousand with the pieces increasing from 0 to 3 with the best capital. The one may be from 0.3 to 60 thousand with the piece is from 0.3 to 1.5 in this study. While the points is in the scope of PAA and PAC it has  $0 \leq Aprofit \leq AC$ , PAC and PAR it has  $AC \leq Aprofit \leq AR$  and  $\geq PAR$  it has  $Aprofit \geq AR$ . The all of the three points which exists in the scope of them may form different one. When the pieces increase the average profit may be larger. The efficiency and profit turn is

$PAR \geq PAC \geq PAA$ . The better one is between PAA and PAC whose piece is from 0 to 0.9 pieces and whose efficiency is from 0 to 30 thousand Yuan according to Cobb-Douglass Function. The Cobb-Douglas Function has the problem whose precision isn't investigated yet by now. So referring to this problem has been deep investigated further later. The two value with the best labor and capital is different from each other. One is 0.9 pieces and the other is 1.1. Thereby the 0.9~1.1 pieces is considered in this paper. On the other hand 32 thousand and 40 thousand may be the correspondent capital respectively. With the same method the 32~40 thousand is the scope we choose. The consistency with each other is needed to study more for example above two groups value. Only if the consistency may be clarified to a certain degree can it be used to application to solving cost matter really by university professor, researcher and interesting ones. The best profit may be attained as the value is bigger than AR that is intersection of point PAR. The more value has been the bigger profit may be acquired according to this paper. The value for best profit is 1.1 pieces for quantity and 40 thousand for capital no matter what it is the best capital or labour.

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