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The Prediction Modelling of Maximum Profit and Quantity with Coefficient on Economics

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Abstract

The tendency of Q and Pr with b1 in constant b is searched in this study. The Q and Pr will increase when b and b1 with constant b1 and b in auto mobile and stock share. The maximum Q and Pr in auto is 3.8 and 250,000 Yuan respectively. Meantime the maximum them is 2,000 and 17,000 Yuan in stock share market respectively. Because it is concave function it has dPr2 (b&b1)/d (b&b1)2>0 for stock share.

Keywords: Maximum profit; Quantity; Modelling; coefficient; Auto mobile; Stock share market; Economics

Introduction

The maximum profit and quantity with coefficient in stock share market and auto mobile market is very important on economics. So the modelling about them is built to analyse and conclude is necessary currently. In this paper the detail modelling establishment and analysing is completed at a certain scope. The modelling is established according to them whilst the reasonable data is done for complete and correct direction in order to decrease the erro and increase the preciseness [1,2]. It is to simulate the actual situation for solving the financial practice problem and corrective instruction and operation role and operation. For the better making decision this program is proceeded too. For the sake of the general manager decision the coefficients are regulated to meet the theoretical method to instruct the correct decision such as financial investment and management in financial division [3,4].

In short the parameters like Pr and Q with b &b1 are better to serve for the practice operation. The detail discussion are shown as below (Table 1).

Modelling Formula Establishment

According to the line formula and parabolic one the coefficient b and b1 will be solved respectively. Defining the other parameter data to calculate the them with different b and b1. Then in terms of this parameter the maximum profit and quantity will be solved. It is supposed that P is 210 Yuan in auto mobile and 30 Yuan in stock share, TC is 90,000 Yuan and 30 Yuan in this modelling. Here Pr is profit Yuan; Q is quantity; a, b and a1, b1, c1 is the coefficients respectively for the line equation and parabolic one. P is the demand; TC is total cost Yuan. Original data arrangement is needed in advance for coefficients. It can be seen in Table 1.

For the sake of solving share in the stock market the modelling of maximum profit and it's quantity in this study has been built as following two kinds of linear and parabolic formula according to the economics principle.

To suppose the product demand function as

$$P = aQ + b \quad (1)$$

It has

$$a = \frac{P_1 - P_2}{Q_1 - Q_2} \quad (2)$$

So $b = p_1 - aQ_1$ (3)

To suppose the total cost function as

$$TC = aQ^2 + bQ + c \quad (4)$$

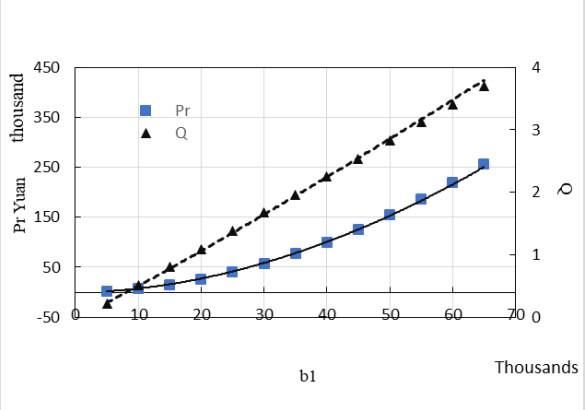
It has

$$b=\frac{(Q_1^2-Q_2^2)(TC_1-TC_3)-(Q_1^2-Q_3^2)(TC_1-TC_2)}{(Q_1^2-Q_2^2)(Q_1-Q_3)-(Q_1^2-Q_3^2)(TC_1-TC_2)} \quad (5)$$

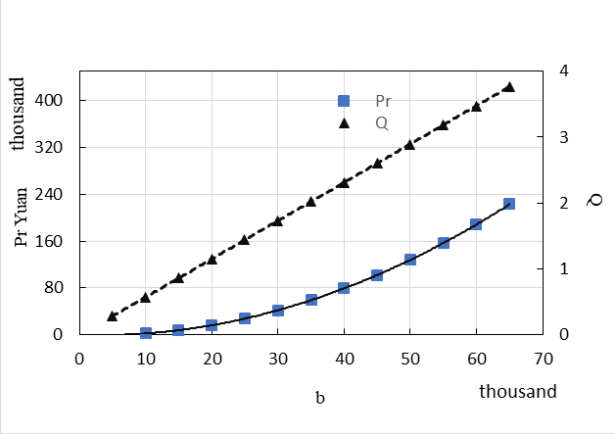
And $a=\frac{-b(Q_1-Q_2)+TC_1-TC_2}{Q_1^2-Q_2^2}$ (6)

So $c=TC_1-aQ_1^2-bQ_1$ (7)

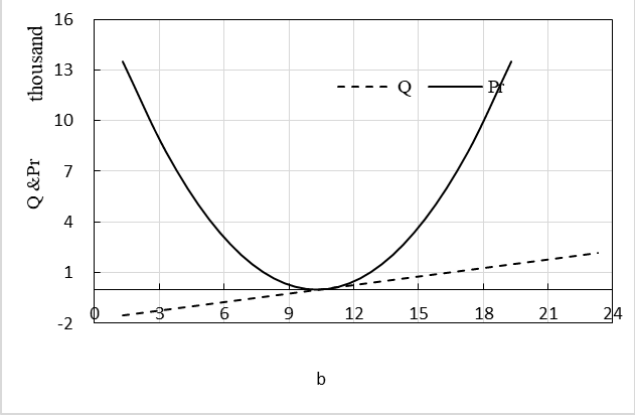
Here P is the demand, Q is quantity, TC is cost, a, b & a1, b1, and c1 is the constant.



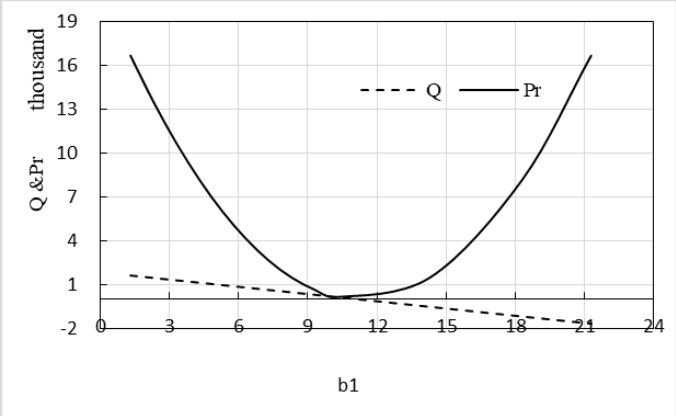
(a) Auto/b=1151



(b) Auto/b1=82

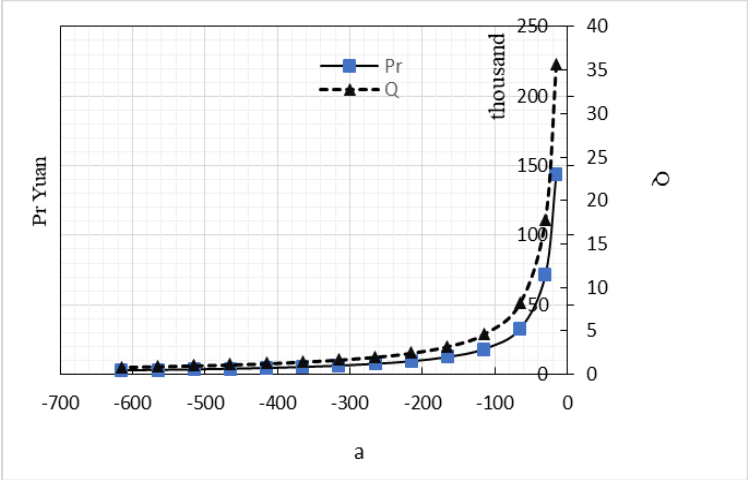


(c) Stock share/ b1=10.3

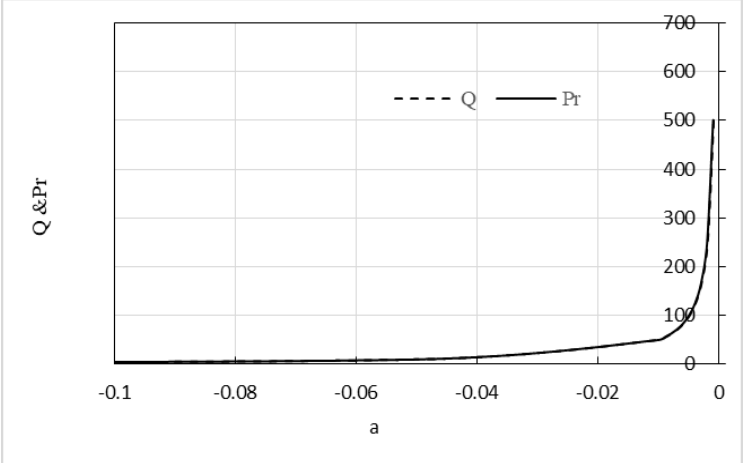


(d) Stock share/ b=11.3

Figure 1: *The graph of Q, Pr & b1, b with various function on economics.*



(a) Auto



(b) Stock share

Figure 2: *The graph of Q, Pr & a with various function on economics.*

The constant coefficient b and b1 as 115 for auto, 11.3 for share and b1 and b as 82 for auto, 10.3 for share in below Figure (a~d) respectively. The detail discussion is shown as below (Figure 1).

In Figure 1(a~d) with function and various b & b1 the Pr and Q will change with b and b1. As seen in Figure 1(a) the Pr increases from 0 to 250,000Yuan with Q being from 0 to 3.8 when b=1151 when it becomes auto mobile so the average profit is 65,789 Yuan. In Figure 1(b) the Pr increases from 0 to 238,000 Yuan with the same conditions. The Q increases from 0 and 0.3 to 3.8 and 3.9 respectively in Figure 1 (a &b) so that the average profit is about 65,000Yuan. The maximum b and b1 both is 65,000. It means that the better profit is attained somewhat when b is larger than b1 (Figure 2).

Table 1: *The coefficient used in this paer for auto mobile and stock share.*

Parameter / item	a	b	a_1	b_1	c_1
Auto mobile	-8627	1151	-2972	82	0.033
Stock share	-0.003	11.3	-0.003	10.3	0

In Figure 1(c~d) in stock share market when b and b1 changes from 10.3 and 11.3 the Pr and Q changes with parabolic and linear one. Pr changes in terms of parabolic and Q is linear one. The maximum Pr is 14,000Yuan and Q is 2,500 with b being 19 under condition b1=10.3 in Figure 1(c) so that the average profit is 5.6Yuan. In Figure 1 (d) the Q is 2,000 and Pr is 17,000 with b= 21 under condition b=11.3, so the average profit is 8.5 Yuan. It means that the better profit is attained when b is larger than b1 too. Since in stock share the Pr and b&b1 has the nonlinear curve with minimum value for concave function it has dPr^2 (b&b1)/d (b&b1)2>0. The left side has the dPr(b&b1)/d(b&b1)<0 since it is decreasing function whilst the right side has the dPr(b&b1)/d(b&b1)>0 since it is increasing function. In Figure 2(a,b) Q increases from 0~37 and Pr increases from 0~148,000Yuan with -600~0 of a for auto mobile, meantime Q≈Pr increases from 0 to more than 500 with 0~-0.1 of a for stock share. It means that when the car quantity is 37 the profit will attain 148,000Yuan for manufacturer whilst the share profit is more than 500 Yuan at the more than 500 quantity which is approximation when a is -0.1. This is another result in terms of the coefficient variation. It still needs to further study to clarify the factor to affect it.

Conclusions

The Q and Pr will increase when b and b1 increases with constant b1 and b in auto mobile and stock share. The maximum Q and Pr in auto is 3.8 and 250,000Yuan respectively. Meantime the maximum them is 2,000 and 17,000 Yuan in stock share market respectively. Because it is concave function it has dPr^2 (b&b1)/d(b&b1)2>0 in stock share market.

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