Theory of Industry Organization Group Presentation

Analysis on sales strategy of China Mobile Communication Corporation

CS&T 95

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OUTLINE -- BACKGROUND

China Mobile Communication Corporation has a much larger market share in the mobile market than China Unicom or China Telecom. **What** is its main sale strategy? **How** and **why** could it gain such a smash hit?

We try to use different models provided in TIO lectures to explore the internal economic causes.

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MODEL INTRODUCTION

MODEL I

Bundling

MODEL II

Price Discrimination

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BUNDLING STRATEGY

Plenty of Bundling Strategy

套餐名称	月租费(元/月)	免费短信数量(条/月)	赠送GPRS流量(M/月)	赠送WLAN上网时长(分钟/月)	赠送业务	
					增值业务	数据业务
校园套餐v1.1-15元	15	150	10			
校园套餐v1.1-25元	25	300	30	300	—	飞信
校园套餐v1.1-35元	35	400	70			

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USING FACT

- Campus Package v1.1
- Price: 25 Yuan
- What it includes : 300 short messages (20yuan if single buy) + (30M of GPRS + 300Mins of WirelessLan) (5+10 Yuan if single buy)
- To start up, we first use mixed bundling strategy of 2 products :

Price (Yuan)	Product
20	Product 1(300 SMS)
15	Product 2(GPRS & Wlan)
25	Product 1 & 2

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Before we start some HYPOTHESES

- **1. Assume x1 and x2 independent:**

  SMS lovers and Internet lovers have little correlation

- **2. Continuously distribution:** 300 million of users
- **3. Even Distribution :** Easy for analyzing
- **4. Zero Marginal Cost:** the marginal cost of communication system is almost zero in fact

∴ Our model **roughly satisfies** the real situation.

★**Statement:**

Before our study, we had made a survey among our classmates and reached a conclusion that product1 is distributed more close to continuously distribution among the range of 0-30, while product 2 is among the range of 0-20.

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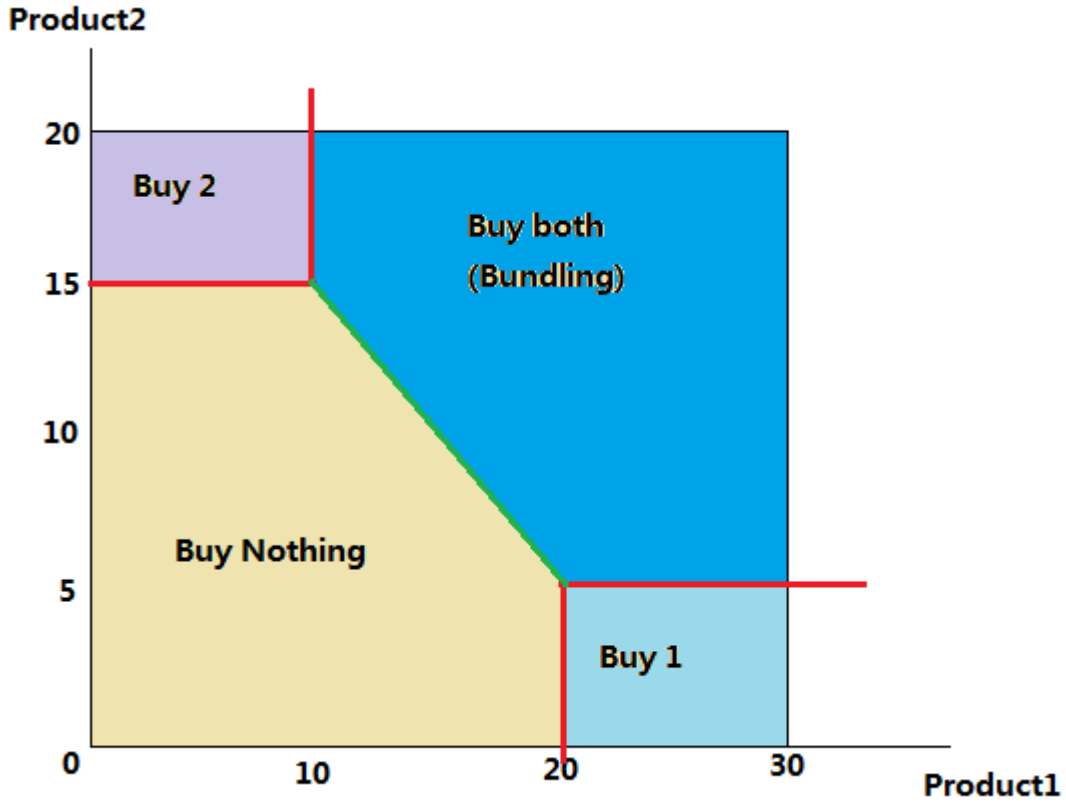
Mixed Bundling Strategy

- Model it just like what we learn in class:
- πB = 20*5*10
  +15*5*10
  + 25*(15*20)
  - 25*50 = 8000

So for each person:

πBp = 8000 / 600 = 13.333Yuan

How about using Separate Strategy?



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Separate Pricing Strategy

- According to the consumer values and what we learn:
- The best price of Separate pricing is

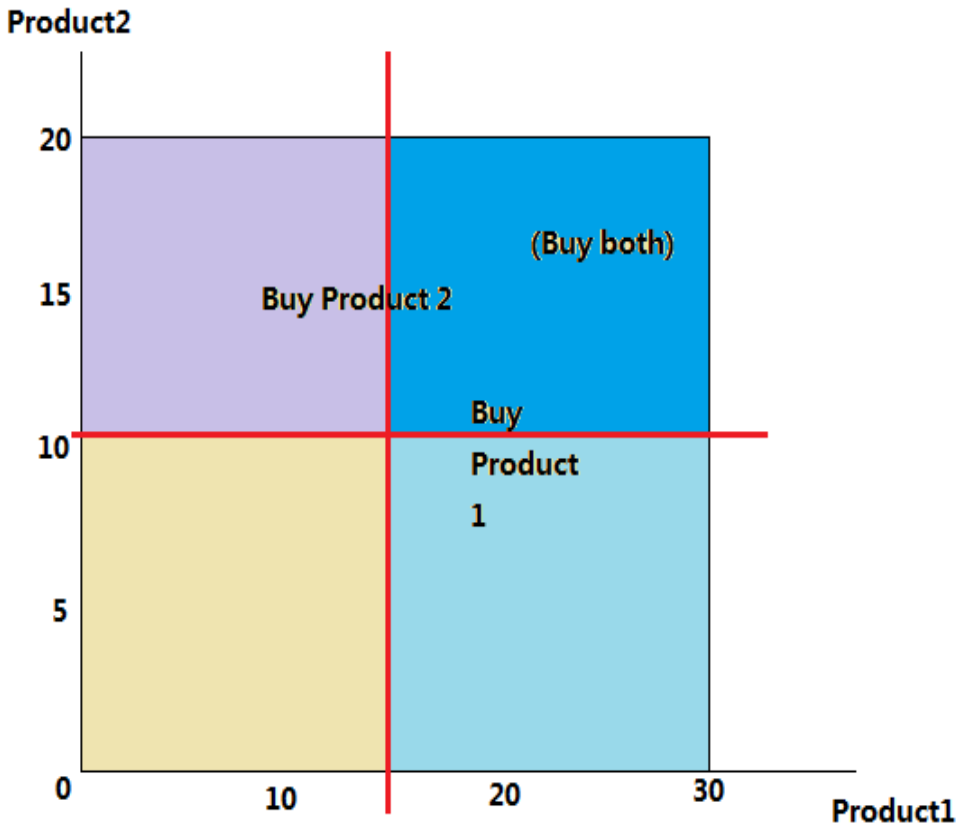
  P1 = 15 Yuan

  P2 = 10 Yuan
- $\pi S = 10*30*10+15*20*15$

  $= 7500 < 8000$
- **For Each**:

  $\pi Sp = 7500/600$

  $= 12.5 < 13.33$



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Meaning of the GAP

- The gap of 0.83yuan might be too small to feel the benefit, then what does it means to real profit of CMCC?
- Let's count in this way:
- The user of CMCC in 2011 is 300 million.
- We assume only 5% of them pay attention to these services (SMS, GPRS etc.)
- The bundling strategy brings more profits of :

  300,000,000 * 0.05 / 600 * 500 =

12.5 million of RMB

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3D-version of Mixed Bundling

- Since we only learn mixed bundling strategy of 2 products in class, in the above model, we assumed that **WLan and GPRS services are always bundled**.
- From now, we would separate all three product and challenge for mixed bundling strategy of 3 products.
- What we still assume is :
- (1) x1,x2,x3 independent; (2) continuous and even distribution; (3) zero marginal cost.

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3D-version of Mixed Bundling

Price (yuan)	Product
20	Product 1 (300 SMS)
5	Product 2 (30M GPRS)
10	Product 3 (300min of WLan)
25	Product 1&2&3

- Theoretically, in 3D bundle, user has 8 kinds of choice to buy.
- However, only **6** should be considered…
- Therefore, we could get the consumer decision:

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Consumer Decision

--3D-version of Mixed Bundling

Choice	Surplus
Nothing	0
Product 1 only	x1 – p1
Product 2 only	x2 – p2
Product 3 only	x3 – p3
Product 2&3	x2 +x3 – p2 – p3
Product 1&2&3	x1+x2+x3 - p_b

- Product 1&2, Product 1&3 are not included.
- Consumer would choose the largest surplus of 6 choices above.

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RESULT

--3D-version of Mixed Bundling

- Solve the probler
  must change the
  every volume of
- So we took the a
- And finally, we gc
  is : 13.523 Yuan

```
#include <iostream>
using namespace std;
int main()
{
    long long profit = 0;
    int p1 = 20, p2 = 5, p3 = 10, p = 25;
    for (double x1 = 0; x1<=30; x1+=0.01)
        for (double x2 = 0; x2<=7; x2+=0.01)
                for (double x3 = 0; x3<=13; x3+=0.01)
                {
                    double s[] = {0,x1-p1,x2-p2,x3-p3,x2+x3-p2-p3,x1+x2+x3-p};
                    double max = -1;
                    int i = 0;
                    for (int ii=0; ii<6; ii++)
                        if (s[ii]>max)
                        {
                            max = s[ii];
                            i = ii;
                        }
                    if (i==1) profit+=p1;
                    if (i==2) profit+=p2;
                    if (i==3) profit+=p3;
                    if (i==4) profit+=p2+p3;
                    if (i==5) profit+=p;
                }
    cout << "The profit from every user is: "(double)profit/3000/700/1300 << endl;
    system("pause");
}
```


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COMPARISON

3D-version of Mixed Bundling & Separate Pricing

- Still, the optimal average profit of separate pricing is 12.5 Yuan/user
- We get 1.02yuan/user profit from the change of strategy.
- Again, by assuming 5% of users of CMCC is affected:
- The total profit is :

15.3million of RMB

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PRICING DISCRIMINATION

Statement: take the MZONE set

Background

- Consumers differ in SMS deman types of consumers --**indire**
- Mobile phone operators are olig
- MZONE set-meal has 6 price qua

  -- use the price quantity bundle

套餐名称	月租费(元/月)	免费短信数量(条/月)	赠送GPRS流量(M/月)	赠送WLAN上网时长(分钟/月)	赠送业务	
					增值业务	数据业务
11元音乐套餐	11	60	—	—	彩铃、无限音乐俱乐部高级会员、音乐盒	—
16元音乐套餐	16	120				
21元音乐套餐	21	240				
26元音乐套餐	26	320				
36元音乐套餐	36	500				
56元音乐套餐	56	1000				
11元网聊套餐	11	60	20	—	—	飞信、5元版139邮箱
16元网聊套餐	16	120				
21元网聊套餐	21	240				
26元网聊套餐	26	320				
36元网聊套餐	36	500				
56元网聊套餐	56	1000				

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Before we start some HYPOTHESES

- 1, **simplify** our model to focus on the demand of SMS and price. (SMS is the major product)
- 2, Marginal cost is **zero.** (only the power cost of signal station)

PQ bundle Price	SMS capacity
11	60
16	120
21	240
26	320
36	500
56	1000

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MODEL CONSTRUCTION

ASSUME:

CONTINUOUS

- there are 6 different types of consumers
- **Demand Curve** : Di(P) = A - k P

  different consumer have same k in the equation above.

  Coefficient A determines the type of consumer.

- The surplus of consumer with coefficient

  CS(i, c)=(Ai*Qc – Qc*Qc/2)/k – Tc

- **OPTIMAL**:

  IR: CS(i, i) >= 0, i = 1..6

  IC: CS(i, i) >= CS(i, j), i != j

36 equations

CS(i, i) >= CS(i, i+1)

CS(i, i) >= CS(i, i-1)

12equations

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MODEL CONSTRUCTION

ACTUALY:

- distribution of consumers is continuous
- **coefficient A is continuous.**

- **CS(A, c) = (Ac – c^2/2)/k – T(c)**
- FOC => CS(A, c) / c=0 => (A-c)/k= T(c)/ c => A = c + k T(c)/ c

∵ CS(A, optimal_c(A)) >= 0 **∴ c^2/(2k) + T(c)/ c * c – T(c) >= 0**

To maximize pi, which **pi = Sigma{T(optimal_c(A))}.**

So **let c^2/(2k) + T(c)/ c * c – T(c) == 0.**

We could get **T(c) = - 1/(2k) c^2 + alpha*c**

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MODEL REVISE

- actual T(c) contains some additional service such as 139mail
- **T(c) = - alpha c^2 + beta * c + gamma** alpha == 1/(2k)

Source	SS	df	MS
Model	1330.98298	2	665.491488
Residual	2.35035773	3	.783452575
Total	1333.33333	5	266.666667

Number of obs	6
F(2, 3)	849.43
Prob > F	0.0001
R-squared	0.9982
Adj R-squared	0.9971
Root MSE	.88513

price	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
c	.0630039	.0047321	13.31	0.001	.0479443	.0780635
cca	-.0000145	4.24e-06	-3.43	0.042	-.000028	-1.05e-06
_cons	7.60692	.9005855	8.45	0.003	4.740855	10.47298

- T(c) = -0.0000145 c^2 + 0.0630039 c + 7.60692

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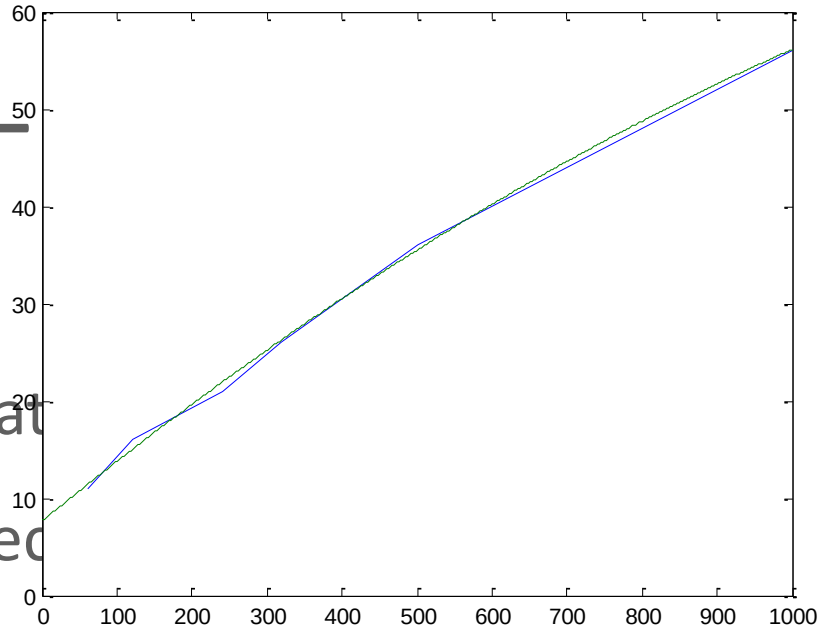
MODEL REVISE

- the additional services like 139 mail worth **7.60692** Yuan in our model
- k = 1/(2 * 0.0000145) = 34482
- **Demand Curve : D(p) = A –**
  - SUPPOSE of k:

    I, demand of SMS has comparat

    II, linear assumption is not effec

    .....FOR FUTURE STUDY



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THANK YOU

BIGIdea
A COOL SLOGAN ON THIS LINE

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