3G

Game Analysis and Strategy Research of Price War in China Mobile Communication Industry Based on 3G Technology Application
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Abstract—Telecommunications restructuring and 3G license mark the coming of 3G age. As telecommunication departments aim to reorganize business and provide the balanced 3G license, the competition of three telecom operators is becoming increa-singly white-hot. China Mobile, China Unicom and China Telecom are competing in a tripartite confrontation market structure. They are evenly matched in the new round of competi-tion. Service homo-genization makes price competition an impor-tant aspect. Based on the analysis of China telecommunication market, this paper adopts price game model to explain the necessity of price war and how to make strategies, which focuses on providing theory foundation to China telecommunication companies about how to gain competition advantages and making contributions to the development of China mobile communication industry.

Keywords—China telecommunications; Game theory; Price war

I. INTRODUCTIONS

3G (3rd Generation) means third generation of digital communication. 3G is a cellular mobile communication technology supporting and providing high-speed data transportation. The biggest advantage of 3G is fast data downloading. Compared with the speed of 100k of 2.5G (GPRS/CDMA1x), 3G can reach about 300k-1M, much faster than household ADSL. In the third communication network, China supports three radio interface standards according to International Telecommunication Union (ITU). They are CDMA2000 from China Telecom, WCDMA from China Unicom and TD-SCDMA from China Mobile. 3G license marks 3G age beginning. As telecommunication departments aim to reorganize business and provide balanced 3G license, the competition of the three telecom operators is becoming an even contest. China Mobile, China Unicom and China Telecom are competing in a tripartite confrontation market structure. The three companies are evenly matched in the new round of competition. Service homogenization makes price competition an important aspect. Based on the analysis of China telecommunications market, this paper adopts price game model to explain the necessity of price war and how to make strategies, which focuses on providing theory foundation to China telecommunication companies about how to gain competition advantages and making contributions to the development of China mobile communication industry.

II. TRIPARTITE CONFRONTATION MARKET STRUCTURE OF 3G TELECOM OPERATORS IN CHINA

Telecommunications restructuring in June 2008 and 3G license granted in January 7th 2009 marked the coming of the 3G age. As telecommunication departments aim to reorganize business and provide balanced 3G license, the competition of three telecom operators is becoming increasingly white-hot.

Figure 1. China telecommunications market structure

A. China Telecom Seizing Early Opportunity

As TD-SCDMA and WCDMA need to build new networks, CDMA network can be upgraded to provide 3G service, which has big superiority on 3G network coverage compared with China Mobile and China Unicom. 3G network coverage of China Telecom is the widest, and at the same time its high speed and stability can’t be ignored. However, China Telecom lacks customer basis and mobile operating experiences.
B. China Unicom Leading in Technical Network

Although China Unicom provides 3G service lately, WCDMA is the most mature, commercially widely used and has the most final products, whose speed is much faster than broadband. China Unicom holds an advantage position in 3G competition. However, China Unicom lacks network building that will be used commercially by the end of this year and this is a great opportunity for the other two operators to promote their products.

C. China Mobile With Great Economic Strength

China Mobile has abundant capital to promote 3G service and its reputation is well-known. China Mobile started 3G business early and has won enough time to construct industry chain. China Mobile owns intellectual property of TD-SCDMA, which is supported by national policies such as forbidding TD users to transfer to other network with original number. China Mobile is restricted by immature terminals and network. So developing final products is a must.

At present, gaining competitive dominance is very important for China Mobile, China Unicom and China Telecom. 3G, the replacement of 2G, is a trend in China mobile communication market. The company gaining the competition advantage will probably be the next leader in China Mobile communication industry. However, service homogenization makes price competition an important aspect of 3G business. Whether adopting price strategy or not is a confusing problem for the three telecom operators. The following chapter looks at pricing game model to explain the necessity of price war.

III. PRICE WAR ANALYSIS BASED ON GAME THEORY

A. Game Theory

Game theory is a two-person game of equality in their respective use of each other’s strategy against the strategy to transform its own, reaching the significance of winning. Game players choose the strategy among their choices to carry out once or for many times at the same time or successively and then gain the corresponding results under certain circumstances and rules. Game players are uncooperatively on the basis of people’s rational behaviors. Game has lots of classifications, for example static game and dynamic game according to player’s order; complete information game and incomplete information game based on the information players know; zero-sum game and non zero-sum game on the basis of benefit players get. Every game includes: a. game players; b. strategies players can choose (S); c. the successive orders in which plays take actions; d. benefits players get (M). The whole process of game is represented by G. [1]

B. Necessity of Price War According to Game Model

Taking China Unicom and China Mobile for example, this paper discusses the necessity of price war in China mobile communication market. The game players are China Unicom and China Mobile. China Mobile has two options whether to lower price or not, which is the same with China Unicom. Suppose that S1 represents China Mobile’s strategies and S2 represents China Unicom’s, S1j is the j strategy of China Mobile, S11 means not to lower price and S12 to lower price. S2j is the j strategy of China Unicom, S21 means not to lower price and S22 lower price. U1 and U2 are game benefits of China Mobile and China Unicom. The game between China Mobile and China Unicom is G={S1,S2 : U1(U2)}.

As shown in Figure 2, suppose that neither China Mobile nor China Unicom lowers price, benefit of China Mobile is U1=R1 and benefit of China Unicom is U2=R2. When China Mobile doesn’t lower price and China Unicom does, the market shares of China Mobile will shrink obviously and it will lose benefit of M1 and then U1=R1-M1. The benefit of China Unicom will increase by N1 and then U2=R2+N2. When China Unicom doesn’t lower price and China Mobile does, China Mobile will improve its benefit by M2 and then U1=R1+M2. China Unicom will suffer losses of N2 and then U2=R2-N2. When both China Mobile and China Unicom lower price, their market shares won’t change leading to losses of M3, N3 respectively. Therefore, U1=R1-M3, U2=R2-N3. [2]

| TABLE I. THE GAME BETWEEN CHINA MOBILE AND CHINA UNICOM |
|-----------------------------|-----------------------------|-----------------------------|
|                             | China Unicom                |                             |
|                             | No lower price              | lower price                 |
| China Mobile                | (R1, R2)                    | (R2-M1, R2+N1)              |
| lower price                 | (R1+M2, R2-N2)              | (R2-M1, R2-N1)              |

The benefit gained from price competition between China Mobile and China Unicom in 3G market is a fuzzy variable zero-sum game. Since they compete viciously in order to exclude each other, we may assume that in a period of time, if a customer uses Mobile cellophone, he won’t use Unicom cellophone. So we can see the benefit one gets as the loss of the other in the competition. As both of them take limited measures, the game between China Mobile and China Unicom can be considered as zero-sum game. While either China Mobile or China Unicom lowers price, it will gain greater market share and higher profit. However, both of them are rational and they will take the other’s behaviors into consideration.

When China Unicom doesn’t lower price, benefit of China Mobile will be U1=R1 if it doesn’t lower price while benefit will be U1=R1+M2 if it does. So China Mobile will definitely lower price. When China Unicom lowers price, benefit of China Mobile will be U1=R1-M1 if it doesn’t lower price while benefit will be U1=R1-M1 if it does (M1>M2). So China Mobile will definitely lower price (strategy S12). Therefore, lowering price is China Mobile’s superior strategy. In the same way, lowering price is also China Unicom’s superior strategy. (lower price, lower price) Strategy is the only one Nash equilibrium of the game model and the final result is G={S12 S22 U1=R1-M2, U2=R2-N3}. Although adopting no lower price strategies for the two companies brings more benefits than adopting lower strategy, the mobile communications companies will still reduce price and finally they are in prisoner’s dilemma of price competition. If neither of them
A. Gaining the Initiative by Striking the First Blow to Face Price War Necessity

Previous analysis shows that price war in China mobile communication market is necessary. Since price war will take place, it is essential to take the initiative. Firstly, service homogenization makes price elasticity of demand of products high, so low price strategy can improve market share greatly and then differentiation strategies could be carried out. Secondly, consumers rely on present telecom operators because of switch cost. 3G is a newly developing market and marks the trend of future mobile communication. Consumers pursue unique 3G numbers. While choosing operators they will take price into consideration. Thus in order to gain the initiative of the competition, it is important to respond quickly over rivals and enhance market share.

B. Differentiation Strategies

Differentiation strategies show that companies have technical advantages or management advantages to produce more qualified and functional products than existing ones, or consumers feel the company difference through distinctive propaganda, flexible promotions and convenient after-sale services. Differentiation strategies can raise costumers demand; enhance sales and market share, which could prevent tit for tat competition. Companies have to suffer some losses while lowering price to increase market share, but profit is the assurance of future development. Therefore, it is necessary to consider how to keep sustainable development while increasing market share. Mobile communication companies can set competitive price for some basic services of 3G business such as calling and online surfing and at the same time develop differentiated products, services and brands to satisfy different consumers, which will bring high profit to maintain future development.

C. Enhancing Customer Loyalty

Customer loyalty is one of the most important profit sources. According to a survey, the cost of maintaining a steady customer is only 20% of that of attracting a new one. The probability of selling to present customers is 50% while the chance is only 15% to sell to new ones. While customer loyalty decreases by 5% profit will go down by 25%. If customer retention is increased every year, profit will increase by 85%. 60% of the new clients are recommended by present clients. The main task of some operators is to attract new customers in market strategy. They believe that the more customers, the more profits and even don’t care the satisfaction of current customers. Although they seem to have larger market share, the real fact is that profit won’t increase. Research on modern marketing has proved that the cost of attracting new customers is much higher than that of maintaining current customers who are the fatal profit source for mobile communication companies to enhance sales.

Mobile communication companies should change the transaction relationship with customers to maintain, deepen and develop the relationship, which aims to promote values of customer relationship management from extensive market expansion to considerate market cultivation and development. Improving customer loyalty can prevent price war taking place at some degree because loyal customers could buy the same and relative products, and also the word of mouth communication is beneficial to the company as customers introduce their products and services to more people. Compared with other kinds of advertisement, word of mouth communication is more trustworthy. Additionally, loyal customers keep service expenses low. Cost of attracting new customers is expensive and it takes times for employees to know new clients and solve negligence problems caused by unfamiliarity with customers. On the other hand, lists of loyal customers are recorded, which is convenient for employees to know and provide services to them, so service expenses are cut down. Finally, loyal customers are insensitive toward price. They will show no interest and still concentrate on the original services and products though price of competitors may be very attractive. Therefore, loyal customers are profit source to companies. If telecom operators want to gain competitive advantage, it is necessary to develop customer loyalty to maintain clients.

V. Conclusions

China mobile communication companies must be aware of the necessity of price war in 3G age. They should manage to forestall other rivals to gain market share and then take product, service and brand differentiation strategies to boost profit. At the same time, developing customer loyalty to make advertisement for the company is a good way to cut costs, increase sales and maximize profit.

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