

Price Regulation and Its Effect on Marketing: The Case of the Mobile Telecommunications Sector in Korea

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Abstract: This paper studies the relationship between price regulation and marketing intensity in the Korean mobile telecommunications service industry, a sector in which direct retail price controls are imposed by the regulatory authority. Facing such price regulations, mobile service providers in Korea seem to have focused on non-price competition in their marketing activities, such as handset subsidies. The findings show that marketing intensity escalates after a price control is implemented until the next price control is imposed. This is a sign of strong competitive pressure even under the legal ban on handset subsidies in Korea. When strong competitive pressure exists and prices are regulated, restrictions on marketing may not work well.

Keywords: non-price competition, price regulation, mobile telecommunications service

When price competition is restricted by regulation, competitive pressure, if any, will eventually emerge in other forms of competition, or so-called non-price competition. The dimensions of non-price competition include quality, after service, subsidies to consumers and agencies, and advertising. This study illustrates a case in which marketing intensity becomes stronger when prices are controlled by a regulatory authority. The Korean mobile service market was chosen for the study because mobile prices are controlled by the regulatory authority, and competitive pressure is believed to be quite strong in the market. First, however, it is worthwhile to discuss why mobile services are regulated and whether these types of direct price controls are common in the mobile service sector or, more broadly, in the telecommunications service sector.

The telecommunications service industry is characterized by large initial invest-

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ments, the existence of essential facilities, and strong network externality, which many believe leads to a natural monopoly. This, combined with the universal nature of telecommunications services, means that the telecommunications service industry is regulated in most countries. Fixed telephony services, for example, are owned and managed, either directly or indirectly, by government authorities in most countries, and some developed countries still exercise control over the major fixed services providers through tariff regulations, mainly in the form of price-cap regulations. However, a trend toward deregulation in the fixed telephony market has become evident since the breakup of AT&T in the United States. Recently, the regulatory frameworks of most countries have been heading toward fostering competition in the fixed telephony markets, moving away from direct price regulation.

In contrast to the fixed communications sector, the mobile communications sector has had only weak regulation from the beginning. Technologically, mobile services are not restricted by the ability to access local subscriber lines, and it is physically easier to construct a mobile network than a fixed network, making entry into the market easier. Given the fair allocation of the frequency spectrum, the mobile sector has less competition issues than the fixed sector. Indeed, more than three mobile service providers can be observed in most countries.¹ The lessons learned from the experiences of the fixed sector have been helpful in designing a proper competitive environment in the mobile sector from the initial stages of its development.

The mobile telecommunications sector in Korea, however, is under relatively strong regulation compared to other countries. SK Telecom (SKT), the dominant incumbent operator, is regulated by the Ministry of Information and Communications (MIC) through a tariff control that is part of a user agreement regulation. Mobile regulation in Korea aims to contain the market power of the dominant operator and promote effective competition in the market while at the same time expanding the information technology sector by guaranteeing appropriate returns on investment. This consideration for the growth of the mobile telecommunications sector-and ultimately, the Korean economy-seems to have worked well. Korea was the first country to launch CDMA (code division multiple access) mobile services commercially, and it is regarded as one of the leading countries in information technology. Some believe the country's strong regulatory position in the telecommunications sector has contributed to the remarkable growth of the information technology sector in Korea.

Although price controls in the Korean mobile sector may have brought some positive outcomes, the players in the market cannot exert complete control over the most important instrument of competition in the face of a tariff approval system and price

1. See Table 1 for the number of mobile operators in the sampled countries.

controls. Under price controls, competition has shifted to other strategic variables involving marketing activities, such as handset subsidies and branding through advertisement. This paper focuses on marketing expenditures in the presence of strong price regulation, using marketing expenditures as a proxy for the degree of marketing activity.

The paper is organized as follows: Section I surveys the current status of mobile telecommunications regulations in several major countries, with a strong focus on Korea. Section II discusses the theoretical and empirical literature related to the topics discussed in the paper. The first part of Section III introduces data and shows some statistics describing marketing expenditures in the Korean mobile telecommunications sector. The second part of Section III discusses the empirical effects of price controls on marketing intensity. The final section discusses the results and future research directions.

MOBILE PRICE REGULATION: INTERNATIONAL COMPARISON

The key rationale for regulating the telecommunications service industry is the possibility of natural monopoly. Telecommunications technologies are characterized by high entry barriers and network externalities that give a large advantage to the incumbent operator. Fixed telephony services, which have the greatest potential for natural monopoly among telecommunications services, are directly managed by the government in many countries or controlled through strict regulatory measures.

Although mobile services share some of the characteristics of fixed telephony services, there are some unique aspects to the provision of mobile services. First, mobile services are relatively free of restrictions on the ability to access local subscriber lines, which acts as a major entry barrier in fixed telephony services. The amount of initial investment is also much lower in mobile services, which use some portion of existing lines to transmit calls and data. The unique problem underlying mobile services is the scarcity of the frequency spectrum that can be allocated to service operators. This problem has been well recognized and handled cautiously by the national regulatory authorities. Most countries have allocated the frequency spectrum to at least two or three operators from the beginning in order to avoid the competition issues experienced in the fixed market.

Because of these differences, mobile services are subject to fewer regulatory measures compared to fixed telephony services. Yet the key area that is subject to regulation in the mobile sector is the mobile call termination market. As Table 1 indicates, a number of countries control mobile termination charges. To terminate a call, access to

the network of the receiving consumer is essential, and this leads to cost-based regulation of termination charges in many countries, whereas some countries leave the termination charges up to the negotiation of the concerned parties. Termination charges are linked to the retail rate in some ways, but the regulation of termination charges does not necessarily result in a comparable change in retail rates.

Table 1. Mobile Price Regulation: International Comparison

| | The Number of NO | Retail Rate Regulation | Wholesale Rate Regulation | Remarks |
|-------------|------------------|------------------------|---------------------------|--|
| Austria | 6 | No | Yes | MT (cost based), MO (for indirect access) |
| Belgium | 3 | No | Yes | MT (cost based) |
| Brazil | 2 | No | Yes | MT (upper limit) |
| Chile | 3 | No | Yes | MT (cost based) |
| Denmark | 4 | No | No | Commercial basis |
| Finland | 4 | No | Yes | MT (cost based), IA (commercial basis) |
| France | 3 | No | Yes | MT (cost based) |
| Germany | 4 | No | No | SMPs in MT: finding remedies |
| Hong King | 6 | No | Yes | MT, NR, NT, IA (cost based) |
| Ireland | 4 | No | Yes | MT (cost based) |
| Japan | 5 | No | No | MT (Commercial basis, considering cost) |
| Korea | 3 | Yes | Yes | MT (cost based) |
| Mexico | 5 | No | Yes | FM (price cap), MT (commercial basis first, cost based next) |
| Peru | 4 | No | Yes | MT (cost based) |
| Poland | 3 | No | No | MT (commercial basis) |
| Spain | 3 | No | Yes | MT (cost based) |
| Sweden | 3 | No | Yes | MT (cost based) |
| Switzerland | 6 | No | No | Commercial basis |
| U.K. | 5 | No | Yes | MT (cost based) |
| U.S.A. | 4 | No | No | |

Note: NO = network operator, MT = mobile termination, MO = mobile origination, FM = fixed to mobile termination, IA = indirect access.

Source: Korea Information Society Development Institute, Ovum Reports (2005, 2006).

There is no direct regulation of retail rates in the countries we sampled, with the exception of Korea.² Specifically, the MIC in Korea designates the service and the operator that needs user agreement approval. The retail rate is an important part of the user agreement, and as a consequence, it is regulated.³ Currently in mobile services,

2. The Australian authority imposed price-cap regulations on telecommunications services, including mobile rates, from 1989 to 2001.

SKT is designated as the operator whose user agreements require approval from the MIC.

Many justifications for the strong regulation of SKT can be provided. First, the market share of SKT has remained stable since 2000 and, as of 2005, held at 55% in terms of market revenue, whereas the market shares of SKT's competitors, KTF and LGT, are 30% and 15%, respectively. The dominance of SKT in the Korean mobile service market can be traced to the period during which Korea Mobile Telecom, the predecessor of SKT, was the only company operating in the mobile telecommunications sector. It was not until 1996, when Shinsegi Telecom entered the mobile market, that the duopoly was formed in the mobile service sector.

The first-mover's advantage was intensified by the merger of Shinsegi Telecom and SKT in 2000. The merger allowed SKT to become the only mobile service company using the 800 MHz spectrum range, which arguably gives cost and quality advantage over other PCS operators using 1.8 GHz spectrum range. The first mover's advantage, combined with the use of the better spectrum range, is known to have provided higher profitability and market power for SKT. Given the steadiness of SKT's dominant position, the MIC has argued that regulatory measures to contain the company's market power are needed. The price regulation under the user agreement approval system is one of the controls used by the MIC. The appropriateness of the tariff approval system and the attempts to find a better remedy for the mobile market are beyond the scope of this paper.

RELATED LITERATURE: PRICE REGULATION AND MARKETING COMPETITION

When price competition is restricted by regulation, competitive pressure will eventually show up in other forms of competition, known as non-price competition. The dimensions of non-price competition include quality, after service, subsidies to consumers and agencies, and advertising. Some may guess that non-price competition is not as effective as price competition at attaining the efficient outcome. Stigler (1968) was the first to point out that non-price competition can be quite effective at attaining efficient outcome compared to price competition. Taking advertising as the typical form of non-price competition, he considered two cases, one in which advertising was fixed jointly and competition in prices was allowed, and one in which prices were fixed jointly and competition in advertising was allowed. Examining these two cases,

3. Designation of the service and the operator that needs user agreement approval from the MIC is based on the Telecommunications Business Act, Article 29.

he found that the answer depends on an empirical judgment comparing the slope of the marginal costs of production to that of the marginal costs of advertising. His study shed light onto the importance of non-price competition even when the prices are controlled by a cartel or regulated by the authorities.

While Stigler (1968) showed that non-price competition can be effective using advertising as an example, other studies have looked at the relationship between advertising to industry concentration and competition, focusing more on the special role of advertising. Studies by Bain (1956) and Comanor and Wilson (1974) suggested that advertising increases industry concentration by building barriers to entry through product differentiation and economies of scale in advertising that favor incumbents. A later study by Dixit (1980) showed that advertising as a sunk cost of incumbents makes the credible commitment of keeping the same output in the face of new entries. In contrast, Nelson (1970, 1974) emphasized the informative aspect of advertising, which generates competition in advertising and facilitates the entry of new firms. Klein and Leffler (1981) showed that the existence of advertising-rather than the content of the advertising-allows new entrants to signal to consumers that their products are of high quality. Theoretical studies on the relationship between advertising and concentration have shown mixed results.

Quite a few empirical works have focused on the role of advertising in industry concentration as well. Some have found that advertising intensifies industry concentration, whereas others have found that it does not. Some recent empirical works have dealt with the effects of advertising restrictions or bans on industry concentration, as in the cigarette industry (Eckard, 1991) or the brewery industry (Sass and Sauerman, 1995). Both of the studies find that ban or restrictions on advertising tend to increase market concentration.

The main empirical question that this study attempts to answer is a more fundamental question about the relationship between price controls and marketing activities. This study explores whether competitive pressure will eventually develop into non-price competition when firms are under price controls. There is some empirical evidence and patterns showing the presence of non-price competition under price movement restrictions in the mobile telecommunications services market in Korea.

THE EFFECT OF PRICE REGULATION ON MARKETING ACTIVITIES: EMPIRICAL RESULTS

Data and Descriptive Statistics

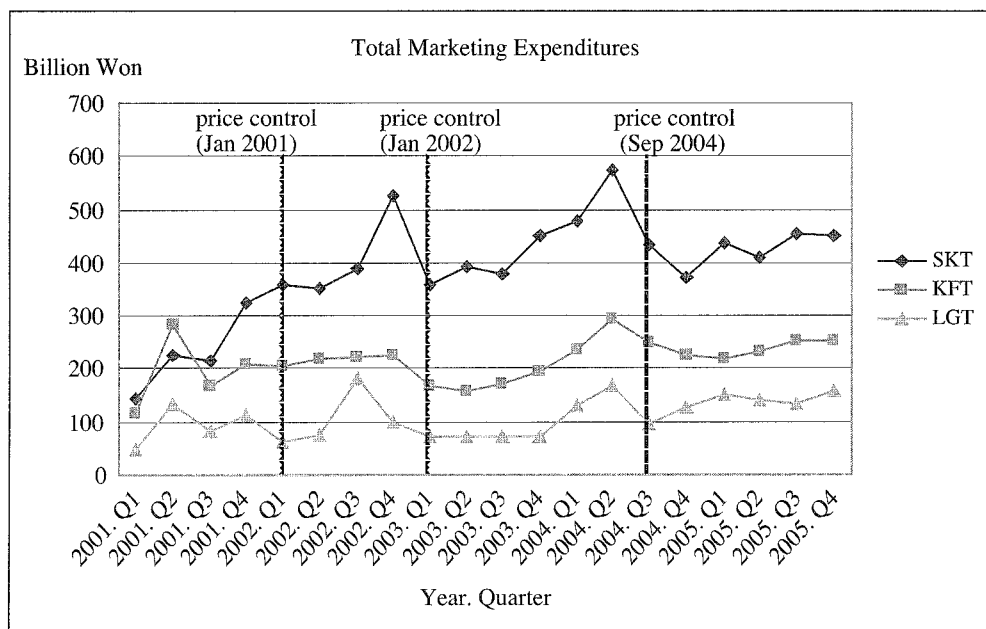
For the empirical analysis, I collected marketing expenditure data—the sum of sales promotion expenditures and advertisement expenditures—using quarterly reports from the three mobile operators in Korea: SKT, KTF, and LGT. The quarterly data span the first quarter of 2001 to the last quarter of 2005. I also collected data on the quarterly revenues and operating profits of these firms. Though these companies were operating before the first quarter of 2001, the data can be reliably traced only to the first quarter of 2001, right after the merger of SKT and Shinsegi Telecom.

Key statistics are reported in Table 2. On average, market-share leader SKT had total marketing expenditures of 385.75 billion won, an amount equal to 179% of the marketing expenditures of KTF and 354% of those of LGT. In contrast to the absolute amount of marketing expenses, the ratios of total marketing expenditures to revenue for the firms are very close, with SKT at 0.172, closely followed by KTF at 0.167 and LGT at 0.162. The ratios of total marketing expenditures to revenue show that no mobile operator in Korea is excessively focused on marketing activities compared to the others. However, it is notable that the ratio of advertising expenditures to total marketing expenditures is quite high for SKT at 0.225—about twice as high as KTF and LGT.

Table 2. Summary Statistics (in billions of won)

| | SKT | KTF | LGT |
|--------------------------------------|--------------------|------------------|------------------|
| Mean, sales promotion (Std. Dev.) | 302.5 (94.30) | 185.3 (42.87) | 97.05 (38.07) |
| Mean, advertisement (Std. Dev.) | 83.25 (27.80) | 29.9 (6.71) | 11.95 (4.42) |
| Mean, total marketing (Std. Dev.) | 385.75 (103.56) | 215.2 (43.43) | 109 (39.20) |
| Advertisement/marketing | 0.225 | 0.143 | 0.119 |
| Marketing/revenue | 0.172 | 0.167 | 0.162 |

Because of the limited availability of data, I dissected the marketing expenditures only into sales promotional expenditures and advertising expenditures. Though the meaning of advertisement is obvious, sales promotional expenditures are not clearly defined. Typically, sales promotional expenditures include commissions to sales agen-

Figure 1. Marketing Expenditures and Regulatory Price Controls

Source: Quarterly reports (SKT, KTF, LGT), Korea Information Society Development Institute.

Table 3. Regulatory Mobile Rate Controls in the 2000s

| | | 4/2000 | 1/2002 | 1/2003 | 9/2004 |
|--------------------------|---------------------------------|------------|----------------------------|-----------------------------|-----------------------------|
| SKT (Standard tariff) | Monthly subscription fee | 16,000 won | 15,000 won | 14,000 won | 13,000 won |
| | Usage rates (per 10 seconds) | 22 won | 21 won (7 free minutes) | 20 won (10 free minutes) | 20 won (10 free minutes) |

Source: Korea Information Society Development Institute (2005).

cies and handset subsidies, which were illegal during the period under consideration. Although the handset subsidy was banned by the Telecommunications Business Act, operators continued to give significant handset subsidies to consumers illegally, and the expenses were mainly in the form of commissions to sales agencies. Although marketing competition can occur along various dimensions, competition in handset subsidies has been the prevailing form of marketing competition in Korea (see Kim, Byun, & Park, 2004).

Price controls were conducted as part of the user agreement approval required for the service provider with the highest market share designated by the MIC. Table 3 shows the regulatory price controls imposed on SKT during the 2000s. The price con-

trols targeted the standard tariff of SKT; its competitors, KTF and LGT, also cut their rates accordingly, but not exactly to the same degree.

Estimation Results

The data used for the regressions reported in this paper are the quarterly data on revenues, operating profits, marketing expenditures, and the timing of regulatory price controls. The reduced-form regression equation reported is as follows.

$$(MKT/REV)_{it} = \beta_0 + \beta_1 REV_{it} + \beta_2 COPR_{it} + \beta_3 POPR_{it} + \beta_4 TPSLPC_t + \varepsilon_{it}$$

for $i=1,2,3; t=1, \dots, 20$.

The ratio of marketing expenses to revenue (MKT/REV) measures marketing intensity. $COPR$ denotes the current operating profit rate. The profitability of a firm can also be measured by the net profit rate. Because the net profits can reflect temporary or unexpected changes in profits following a change in the value of shareholdings and other group risks that they are subject to, firms are not likely to change marketing intensity based on net profitability. $POPR$ represents the operating profit rates of the preceding quarter, and $TPSLPC$ denotes the time passed since the last price control. The effect of price controls on marketing intensity was captured using $TPSLPC$, which was calculated by giving a 0 value in the quarter in which a regulatory price control occurred and then adding 1 to the value as each quarter passed until the next price control occurred, when the value went back to 0. For the first quarter of 2001, the regulatory timing variable has a value of 3 because a price control was implemented during the second quarter of 2000. By using the regulatory timing variable $TPSLPC$, the regression attempts to explain what happens to marketing intensity after a regulatory price control is implemented.

Because of the small number of observations, I ran pooled ordinary least squares regressions in which all data from the three operators were treated without identifying each operator. By pooling the data, this regression ignored the firm specific effects. Table 4 reports the estimation results, considering the total marketing expenditure/revenue ratio, the advertising expenditure/revenue ratio, and the sales promotional expenditure/revenue ratio as dependent variables. Marketing intensity, measured by MKT/REV , increased significantly as the revenues of the firms went up. Additional revenues of 100 billion won increased the marketing total expenditure/revenue ratio by 0.183 percentage point. This implies that the larger service provider with high revenues indeed showed stronger marketing activities. Current operating profit rates were negatively and significantly correlated with marketing intensity. High current profit rates

can strengthen current marketing activity, but the estimation shows the opposite result. Marketing expenditures of mobile operators in Korea seem to be the dominant factor in determining operating profit rates. Higher operating profit rates mean lower marketing ratios in the same period. In contrast, higher operating profit rates in the preceding quarter significantly increase total marketing expenditures in the current period. The results imply that mobile operators tend to use realized operating profits to fund advertising and sales promotion in the current period.

Table 4. Estimation Results

| Independent Variable | Dependent Variables | | |
|----------------------|----------------------|---------------------|----------------------|
| | MKT/REV | ADV/REV | PROM/REV |
| REV | 0.183 ** (0.077) | 0.023 (0.026) | 0.160* (0.080) |
| COPR | -0.272*** (0.067) | -0.015 (0.022) | -0.257*** (0.070) |
| POPR | 0.175*** (0.063) | 0.086*** (0.021) | 0.089 (0.065) |
| TSLPC | 0.463 ** (0.194) | -0.054 (0.064) | 0.517** (0.202) |
| CONSTANT | 14.767*** (0.959) | 1.208*** (0.319) | 13.559*** (1.003) |
| R ² | 0.367 | 0.532 | 0.324 |

REV = revenue (in 100 billion won), MKT = total marketing expenditures, ADV = advertising expenditures, PROM = promotional expenditures, COPR = current quarter operating profit rate, POPR = previous quarter operating profit rate, TSLPC = time since last price control.

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Standard errors are in parentheses.

Looking at the separate regressions with advertising ratio and sales promotion ratio as dependent variables, the coefficient of *POPR* was roughly same, at 0.086 and 0.089, respectively. The result means that 1 percentage point increase in the operating profit rate in the preceding quarter led to an increase of 0.175 percentage point increase in the marketing ratio and a roughly equal percentage point increase in the advertising and sales promotion ratios. Because the advertising ratio is smaller in number than the sales promotion ratio, the similar percentage point changes in advertising and sales promotion caused by *POPR* suggest that the effect of the increase in *POPR* was more pronounced in advertising than in sales promotion. The coefficient for *TPSLPC* (time passed last price control) turned out to be positive at 0.463 and significant at the 5% level. The result suggests that the marketing/revenue ratio went up by

0.463 percentage point as each quarter passed. Though price controls may cool down competition by affecting the profitability of mobile operators in the short run, competitive pressure in the mobile market broke out in other forms of competition, such as marketing competition, and marketing intensity went up as time passed.

CONCLUSION

This paper has studied the relationship between price regulation and marketing intensity using the case of the Korean mobile telecommunications service industry, in which direct retail price controls are imposed by the regulatory authority. When firms face restrictions in price movements, some kinds of non-price competition can arise. The estimation results show that marketing intensity escalates after a price control is implemented until the next price control is imposed. As Stigler (1968) has pointed out, non-price competition can be equally effective at achieving a competitive outcome. If there is room for marketing competition, firms' inability to control prices might not be so hazardous.

The appropriateness of fierce marketing competition in terms of handset subsidies and advertising in the Korean mobile telecommunications market has been debated. Some have argued that excessive marketing and advertising fortify the dominant position of the incumbent operator, whereas others argue that marketing activities work as useful instruments for entrants or followers to increase their market share by signaling quality to consumers. The economic literature on the effect of advertising on market concentration is mixed. It should be noted that placing restrictions on marketing in addition to price controls leaves no strategic variables to firms. When strong competitive pressure exists, restrictions on marketing might not work well. It is not surprising that firms have chosen to be repeatedly fined by the regulatory authority in order to give away a significant amount of illegal handset subsidies. Under this perspective, the lifting of the ban on handset subsidies in 2006 was a wise move that should foster competition in the Korean mobile telecommunications sector.

Future research should focus on building a game theoretic model of marketing competition among mobile operators under price controls and making the regulatory control variable endogenous to the model. If we can obtain a longer and finer time-series data set, we can try other efficient methods to mitigate the endogeneity problem, which may arise in the reduced-form regression, and to capture firm-specific effects.

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