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An investigation of the word-processing software market war in South Korea: A game-theoretic approach

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ABSTRACT

We adopted a game-theoretic approach to studying competition in the software market that is dependent on the network effect, i.e., where the success of the software product is mainly affected by the size of its installed base. The primary goals of our research were: to provide insights into competition between a new entrant with a significant presence in foreign countries and a home-grown incumbent, and to offer evidence in support to the theory of competition in the software market. Our analysis of word-processing software competition in South Korea between 1997 and 2003 suggested that there are several factors that caused the new entrant [*Microsoft* in this case], to overtake the native incumbent as the market leader. The findings are integrated into a discussion of the managerial implications.

1. Introduction

The competition for software market dominance has been seen as important since the start of the software industry from the consent agreement of IBM in 1968. It removed free operating systems from mainframes in the IT industry. One distinctive characteristic of software is the demand-side effect that is the result of inertia or upward compatibility of systems (including switching costs), contagion (such as the bandwagon effect), and network externality (involving interoperability across hardware platforms). These effects result in a non-linear software market, where it is possible for the winner to take all [5]. Such an occurrence is more likely when the competing software is not interoperable, (e.g., a document created in one word-processing software cannot be viewed or edited in another), or when it is implemented on a particular hardware platform, as in the case of systems that can only run on Macintosh computers and not on PC-compatible ones. In such situations, can a software firm compete effectively?

There are two approaches that can be taken to address this question. The first focuses on market competition by examining the static short-run or stable long-run market outcomes. Bertrand and Stackelberg market models [3] have been used, but they rarely take into consideration the dynamic interactions among the competing firms. For instance, conventional wisdom would suggest that the firm which enters a market first would be able to gain market share, making it the dominant player. Thus the first-mover can enter the market and gain early benefits. Lock-in of customers, often occurs due to the inertia for adopted products resulting in difficulties for nascent ones gaining a toe-hold. However, first-mover advantage does not always equate to a large market share. Even if an advantage is gained, a firm might lose the installed base should it fail to maintain a high lock-in cost to deter the customers from switching to competing software.

The second approach is to model the market through a dynamic game with many episodes. Several theories have been proposed to capture the strategic behavior under a dynamic market structure. However, most studies focused on the issue of anti-trust laws. And the empirical investigations were mostly restricted to the software markets within the United States or the entire world. To this end, discussions have often focused on *Microsoft*'s market dominance.

Our study adopted the second approach, but with a slightly different focus, by considering another software market structure where a new entrant with a strong presence in other countries faces a strong native incumbent. Specifically, our study adopted the game-theoretic perspective to analyze a situation where the

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software giant sought to enter a market that has been occupied by a local firm. This resulted in the word-processing software war in South Korea between 1997 and 2003. We formulated a theoretical understanding of software competition from the empirical outcomes of the word-processing software competition in South Korea.

2. Software market dynamics and the network effect

Prior research primarily focused on examining the effectiveness of legislation in promoting market efficiency and restricting a firm's monopoly of the market. For instance, several studies were conducted to examine the effect of anti-trust laws in the browser war between *Microsoft* and *Netscape*. In recent years, with the increasing popularity of open source software, there has been an inquiry on whether to regulate software, e.g., Linux, that is licensed under GNU's general public license (GPL) and also to determine whether supplying copyright software under GPL would violate anti-trust laws [7].

Collectively, these studies discuss a predicament: should we allow the market to function with minimum interference or exert greater control to regulate the competition among firms? Software often has high economies of scale: the low reproduction cost, *versus* the high development cost provides a barrier against competitors attempting to enter the market. However, the higher economies of scale do not necessarily translate into a lower selling price.

We believe that there are two major developments that offer the prospect of gaining better understanding of software market competition. The first is in modeling and capturing the consumer choice of software in response to price and quality change in the products, while the second, the focus of our study, is on the development of dynamic game-models for different stages of competition between two or more firms. This extends the traditional methods by incorporating an important characteristic of the software market, i.e., the network effect, which is observed when a customer's demand for a product depends on the number of people who are using the software. In other words, a customer's benefit increases as more people adopt the software. Customers are willing to pay a premium to purchase software that is compatible with the dominant standards.

Studies on competition in the presence of the network effect suggest that both the incumbent and the new entrant have a tendency to lower prices. The incumbent, normally the dominant firm, would offer a low price to deter new entrants and existing competitors. For instance, in *Microsoft* dominant markets, *Microsoft* typically offers lower prices to discourage new entrants by decreasing their incentive for entry. Through examining the economic effectiveness of such a preemptive move, however, cutting prices upon the entrance of new players might more effectively deter entry, than cutting prices prior to entry of a new player. Hence, it may not be optimal for the incumbent to price low at the start.

Among other factors, product quality is an influential aspect influencing the outcome of a competition. Furthermore, product compatibility in addition to quality affects consumer choice of a product. A firm with more sophisticated or advanced technology may not necessarily emerge as the dominant market player due to high costs of switching to another technology. Intuitively, a new entrant would attempt to produce software that is compatible with the existing software in the market. We observed that products in the market within a similar domain (e.g., word-processing) are relatively compatible. Hence, anchoring on the prior studies, we examined the dynamics of the word-processing software by considering both pricing strategy and product quality in a dynamic game.

3. Word-processing software competition: *Microsoft* versus *Hancom*

A unique trait of a software product is that the first unit is costly to produce but subsequent units costs little to reproduce. This characteristic offers the producers almost unlimited production capacity to meet any demand. Both this characteristic and the lure of the ability to charge a premium once customers are locked-in, do indeed attract firms to enter the software market despite the fact that software piracy contributes to profit erosion [6]. In South Korea, the attractiveness of entering the market is further fueled by the appealing incentives offered by the government (financial aid, reduction in military service, and inducing a strategic alliance between venture capitalists and public R&D institutions).

In the word-processing software market, *Microsoft* enjoys the majority of the market share in most parts of the world, with few exceptions. However, in South Korea *Microsoft's MS Word* accounted for only 11% of the market share in the early-1990s, while domestic firms enjoyed the rest. In particular, Hangul & Computer Co., Ltd. controlled 83% of the South Korean word-processing software market. Fig. 1 shows the market share distribution in 1997.

3.1. Rise of Hancom

Hangul & Computer Co., Ltd. (hereafter referred to as *Hancom*), a South Korean domestic software firm, was founded in 1990. The product lines sold by the firm included *Hangul*, word-processing software, *Hancom Office*, office packages, and *Hancom Groupware*. Of all these products, *Hangul* was the 'cash cow'.

Hangul was developed in the late-1980s and its main users were university students. Eventually, they became accustomed to *Hangul* and its usage continued beyond their graduation. Lerner and Tirole [4] termed this the "alumni effect". Along with swift penetration of computers in homes and workplaces, the firm's market share in the word-processing market astonishingly reached 83% in 1997. *Hancom* continued to invest heavily in product R&D to improve *Hangul's quality*. Since its founding, over 30% of annual sales have been injected into R&D. Such investment has assisted *Hancom* in strengthening its competitive posture, sustaining its growth, and enabling it to continue to enjoy its place as top word-processing software developer and distributor in South Korea.

Essentially, *Hancom* was able to profit from its significant market share and the loyalty of customers who supported and loved the product; from another perspective, the customers were locked-in. The firm was even touted as the iconic representative of the IT industry in South Korea and became the national pride of the populace in the mid-1990s.

3.2. Trouble brewing for Hancom

In 1998, the IT industry was facing serious trouble due to stagnant PC sales and rampant piracy, which was regarded as the

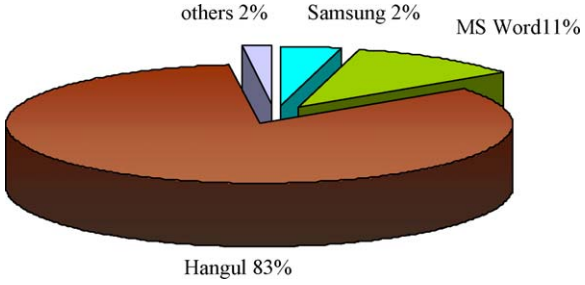

Fig. 1. Market share distribution in the word-processing software market.

main reason for the shrinking software market and high software prices. In addition, the Asian financial crisis also contributed critically to the weakening of *Hancom*. The decline in revenues, coupled with the economic crisis, contributed to its decision for an equity sell-off; it was obliged to introduce foreign capital due to the financial crunch caused by a foreign exchange crisis. Its competitor, *Microsoft*, saw this as an opportunity to compete for a larger market share. In June 1998, *Hancom* announced that it had agreed to accept a sum of between US$10 and $20 million from its arch-rival *Microsoft* on the condition that *Hancom* would stop investing in R&D and focus only on new software development.

The announcement of the deal immediately aroused a hostile reaction from the South Korean public, who regarded the action as damaging to national pride. In response to the anger over *Microsoft*'s aggressive marketing in South Korea, its Chairman Bill Gates who was visiting South Korea, assured the people that he might reconsider a plan to take over a leading Korean-language word-processing project. Co-incidentally, the movement to revitalize Korean-language word-processing software entered a new phase as the local parties concerned were about to form a union. A "*save Hangul campaign*" was started by the head of the Korean Venture Business Association. Finally, the public antagonism to *Microsoft* forced *Hancom* to accept a rescue attempt by a South Korean group of investors. Unfortunately, *Microsoft* saw this rescue in a negative light and launched an aggressive foray into the marketplace.

3.3. Competition

The competition between *Hancom* and *Microsoft* intensified, with a price war between the two companies starting in 1998. *Microsoft* also had a technology break-through in 1999 when it introduced *MS Word 2000*. New factors affecting competition, software compatibility, the financial strength of each company, and changes in software preferences due to globalization, compounded the situation. Table 1 presents the various releases of the word-processing software by *Microsoft* and *Hancom*. A detailed analysis of each factor is beyond the scope of this study but a brief discussion is provided as appropriate.

Here we focus primarily on the pricing strategies of the firms. The prices of the products between 1997 and 2003 are shown in Fig. 2.

4. Analysis

As the case spanned 7 years, we split our analysis into four stages: "1997 and before", "1998–1999", "2000–2002", "2003–2004". This stage-based analysis allowed us to identify the key events during the 7 years, and subsequently conduct in-depth analysis of each stage. Our approach used industrial organization techniques to analyze and rationalize the major moves made by the two firms. Furthermore, we identified consecutive competition stages during which both target companies were engaging in

Table 1
Releases of word-processing software.

Year	Microsoft Word	Hancom's Hangul
1997	Word 97	Hangul 97
1998		
1999	Word 2000	
2000		Hangul Wordian
2001		Hangul 2002
2002	Word 2002	
2003	Word 2003	Hangul 2004

Source: http://www.computerliteracy.co.uk/word_versions.htm; http://www.haansoft.com/hnc4_0/english/hangulhistory.htm.

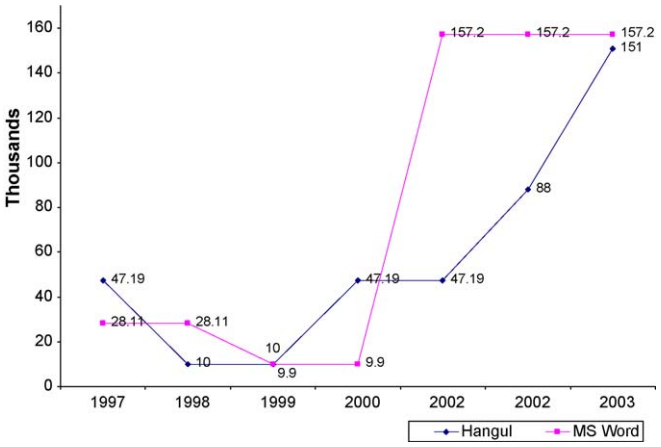

Fig. 2. Product retail prices. Estimated retail prices in Korean Won (KRW).

different strategies. We were thus able to gain a better understanding of a chain of events across different stages, as well as the impacts of one company's strategic development on the other.

4.1. First stage (up to 1997)

Hangul was the main word-processing software used in South Korea from the early-1990s. *Microsoft* was late in entering the market in South Korea. Although it did introduce *MS Word 97* in 1997, which was very popular in other parts of the world, it apparently failed to induce users of *Hangul* to switch to *MS Word 97*.

Microsoft's market entrance was met with strong resistance not only by the incumbent but also by the customers of *Hancom*. Most of its existing users were accustomed to using *Hancom* and switching would require substantial learning and costs. Furthermore, there was little compatibility between the two. Indeed, *MS Word 97* was not fully customized to accept Korean characters, which was the primary script. Given these reasons, *Microsoft* decided to reduce the price of *MS Word 97* to KRW 28,110 (which was 40% cheaper than *Hangul 97*) in an attempt to win over some users of *Hangul* whose retail price remained at f KRW 47,190.

The reduced price was insufficient to induce *Hancom* users to switch to *MS Word* due to the perceived difference in product quality. *Hangul 97* continued to be favored by most desktop users in South Korea and *Hancom* continued to dominate the market with a penetration of over 83%.

4.1.1. The analysis

In our model, we consider competition between the "extant" (i.e., *Hangul*) and the "new" (*MS Word*), denoting them as H and M, respectively. *Hancom* sells a software product which is already in use when the analysis begins at time zero. Both firms choose their retail prices simultaneously. In period 1, we assume that only H preexists time zero and the incumbent has captured the market with sufficiently low pricing to attract customers. At the start of period 2, M enters the market.

All customers enter the market in period 1 and are in the market in every period from that time. In each period, the qth customers have a reservation price $f(p)$, net of switching costs, for a single unit of a product. Any customer, who purchases from a different firm than the one from which he or she purchased in the preceding period, or who chose not to purchase in the preceding period, incurs a "switching cost", $s > 0$. All firms have constant marginal costs, c per unit, and no additional fixed costs given that both firms have already produced the software.

We examine the pricing game of the two firms, by varying the switching cost of the customers to "switch" from *H* to *M*. Given that the switching cost is minimal, in period 2 *Microsoft* would be willing to offer *M* at a price of *c*. This would attract all *Hancom*'s customers as *Hancom* is likely to price above $c + s$ to compensate for the loss in profit in period 1. Thus, knowing that *Microsoft* would be pricing at *c*, *Hancom* would set a price less than or equal to $c + s$ in period 2 to remain dominant.

Presuming that the switching cost is considerable, *Hancom* should target the higher-valuation price customers than compete with *Microsoft* at a lower price for the entire software market, because the increase in profit from catering to the whole market may be less than the reduction in profit from lower pricing. Thus the better strategy is to make the retail price equal to the valuation price of the marginal customers to whom *Hancom* sells in period 1. These are "old" customers because *Hancom* could set the price as *c*, yielding zero, to initially attract them to purchase before *Microsoft* enters the market.

Moreover, given that repeat-purchasers would obtain zero surplus (for the price set at valuation price) in period 2, the customers would be likely to procure only if the switching cost was compensated for in period 1 with a price that was at least *s* below their reservation price (the highest price they were willing to pay). Thus *Hancom*'s period 1 price should be at least *s* below its period-2 price. Additionally, since *Hancom* is likely to set a price higher than that in period 1 to cater to the higher-reservation price customers, the entrant *Microsoft* would be better off if only targeting the lower-reservation price customers.

In both situations, *Hancom* would be setting a higher price than *Microsoft* in period 2, but this would not necessarily make customers "switch". This explains why *Hancom* continued to dominate the market by setting a higher price. Furthermore, it is clear that *Hancom*'s customers experienced lock-in. Hence, although *Microsoft* priced aggressively, it failed to change the market and earned a relatively low profit in stage 1.

4.2. Second stage (1998–1999)

Having learned in stage 1, *Microsoft* realized that setting the price relatively lower was insufficient to induce *Hancom*'s customers to "switch" to *M*. This led to *Microsoft* investing heavily in improving the product quality of *M*. In 1999, *Microsoft* introduced *MS Word 2000*. Its launch signaled a new phase of the competition, because it *resembled* the system interface design of *H* and incorporated multi-lingual support (to reduce the learning cost). In addition, *M* was equipped with added functionality and could recognize document files created in *H*. In contrast, *Hancom* faced a financial crisis because sales from *H* contributed to the bulk of *Hancom's* annual revenue; thus they had a limited budget for improving the *H*'s quality.

4.2.1. The analysis

Due to the complexity of accounting for the competition in stage 2, the analysis was split into two: Phase 1 provides an explanation for why *Hangul* under-invested, while Phase 2 projects a dramatic change in market dominance by analyzing why *Microsoft* succeeded in "tipping" the market.

4.2.1.1. Phase 1—should Hangul innovate?. In addition to the commonly cited reason for *Hancom's decision* to spend less on improving the quality of *H* due to piracy and financial difficulties, there is another possible reason: there is less incentive to invest on improving product quality if it has already captured the market. This analysis is based on the analysis of Fudenberg and Tirole [2].

We consider a two-period game. In period-1, the incumbent, *Hancom*, spends k_1 on R&D, and incurs a constant marginal cost of $\acute{c}(k_1)$. As in stage 1, *Hancom* is the dominant software firm and receives the monopoly profit $V^m(\acute{c}(k_1))$ in period-1. In period-2, both *Hancom* and *Microsoft* might decide to invest in R&D on their product, and this allows for an average marginal cost of *c*. If one firm develops the innovation, it could potentially capture the market and receive the monopoly value $V^m(c)$. Thus, the impact of innovation is "large". If both firms develop the innovation, their profit is zero but the incumbent still remains dominant. If neither firm develops innovations, then the incumbent receives $V^m(c)$ since it could continue to leverage on the existing customer base. We further assume that the R&D technology in period-2 is stochastic and $\dot{u}_i(0) = \text{infinite}$, $\dot{u}_i > 0$ and $\ddot{u}_i < 0$. In other words, if firm I spends x_i on R&D, it obtains the new technology with probability $\mu_i(x_i)$. The profit for both firms in period-2 will be:

$$\pi^H = \mu_H(1-\mu_M) \times V^m(c) + (1-\mu_H)(1-\mu_M)\, V^m(c) - x_H$$

$$\pi^M = \mu_M(1-\mu_H) \times V^m(c) - x_m$$

After performing the first-order condition, we obtain:
For *Microsoft*: $\grave{u}_H[V^m(c) - V^m(\acute{c})] \times (1-\mu_m) = 1$
For *Hancom*: $\grave{u}_M \times V^m(c) \times (1-\mu_H) = 1$

From the first-order conditions, we observe that the increase in profit for *Microsoft* is the difference in monopoly profits and this leads to a lower incentive for the incumbent to innovate. Essentially, the incumbent just needs to invest sufficiently to retain its dominance in the market. Before deciding whether *Hancom* should "under-invest", we need to review period-1, when a higher investment k_1 will lead to a lower profit for *Hancom*. Thus, it is in its interest to lower k_1 to maximize the profit returns and to focus on the competition in period-2. However, then we know that the increase in profit is relatively low and hence, there is a relatively greater incentive for *Hancom* to "under-invest". Furthermore, k_1 has no direct impact on the profits in period-2 and hence, there is an even greater incentive to under-invest. Essentially, being an incumbent, *Hancom* is more likely to under-invest than to invest heavily to improve the quality of the product. In addition, with the presence of switching costs, the incumbent may act less aggressively, a phenomena commonly termed the "fat-cat" effect, and consequently competes less aggressively; its rival would be strong and hence also compete less aggressively. This creates an opportunity for the entrant firm *Microsoft* to improve on product quality, and, judging from what transpired in phase 2, such a belief and decision could have a detrimental effect on the dominance of *Hancom* in the market.

4.2.1.2. Phase 2—how Microsoft "tipped" the market. In phase 1, we only provided an explanation for why *Hancom* persists in under-investing: the consequences of differences in product quality were not examined. We now address the issue of product compatibility and pricing modifications to the model were made by including game sequences of two periods and customer valuation, while presuming that *Hancom* had captured most of the market share and benefits by substantial networking. Meanwhile Mirosoft had a small market share and was able to market its new version of product *M* which had a *higher* product quality than *H*. We let the net quality difference of *H* over *M* to be *q* and positive. We also presume that *Microsoft* had costs m_t in period *t*, while *Hancom* had costs h_t.

We assumed each customer purchased at least one unit of a product. All customers were assumed to be users of *H* before *Microsoft* introduced the newer version of *M*. Any customer who purchased from a different firm than the one from which he/she purchased the earlier software incurred a "switching cost", $s > 0$. We assume that a customer would switch to purchasing from *Microsoft*, if and only if, the net utility of choosing *M* was positive.

Furthermore, there was a strong network effect when the second-period adopters (or customers) followed the first-period adopters if both products were priced at cost (including the switching cost) and would pay r for a product compatible with its first-period adoption.

The process therefore proceeds as follows. In period 1, both firms price the products and period-1 adopters make the decisions. In period 2, both firms re-price the products and period-2 adopters make their decisions. It is evident that when a firm fails to win period-1 sales, it knows that it will lose in the second period. Hence, *Hancom* would be willing to lower price to $h_1 - (r + s + q - h_2)$ in order to win first-period sales, while *Microsoft* would be willing to lower its price to $m_1 - (r - s - q - m_2)$. Consequently, the second-period prices depend on period-1 penetration pricing and the firm that wins the battle depends on the difference between the switching cost and the value of the quality difference. In this case, the new version of *M* is not only compatible with *H,* having file portability and interface similarity and including multi-lingual support with better quality. This could create sufficient incentive for first-period adopters to "switch" to *M*. This leads to period-2 adopters following the choice of period-1 adopters and abandoning *H*. Thus *Microsoft* overtakes *Hancom* as the dominant player in the market.

4.3. Third stage (2000–2002)

Hancom launched *Hangul Wordian* in 2001 and *Hangul 2002* in the year 2002 in an attempt to win back the market share lost to *Microsoft*. The newer versions of their word-processing software were supposed to be compatible with *MS Word* and, at the same time, to incorporate many of its strengths. Unfortunately, *Hancom* had limited financial resources or capital whereas *Microsoft* had capital and was determined to succeed. In addition, *Hancom*'s new products were unable to fully integrate the two different technologies and subsequently the product *H* failed to make any noticeable difference in sales, upsetting Hs loyal customers.

Meanwhile, once *Microsoft* was able to introduce its new product, *MS Word* 2002, which was sufficiently more advanced than *H*. *Microsoft* quickly reached a monopolistic position similar to that held by *Hancom* before *Microsoft* entered the market. Without any comparable competitors, *Microsoft* raised its price. In fact, it was much higher than the price previously set for *H*. Similarly, *Hancom* was forced to respond the way *Microsoft* did at the start of the conflict.

4.3.1. The analysis

This model simply revisited the earlier monopoly model in stage one, except that the two firms had now switched into in the opposite position. As in the first stage, *Microsoft* was able to set a higher price, KRW 157,200, and *Hancom* was not able to attract customers to switch, even at a price of KRW 88,000, because the switching costs were simply too high. This would continue to be the case until *Hancom* wa able to improve its technology to match that of *Microsoft*.

4.4. Fourth stage (2003–2004)

Hancom's response to the monopolistic position of *Microsoft* was to target price-sensitive customers, specifically individuals and small-medium enterprises (SME). In addition, in 2004, their technology (with the launch of *Hangul 2004*) finally improved to the point that *H* was significantly poorer in software quality than *M*. This re-focusing of the market segment was clearly a 'judo strategy'.

4.4.1. The analysis

Judo economics describes market situations as *small firm using a rival's large size to their advantage*. In a more elaborate form, the smaller firm chooses to price lower and limit it production capacity. Such an action may induce the incumbent to choose to accommodate so as to contain the entrant, in which case, the survivability of the entrant is ensured.

While the issue of capacity constraint and limitation has been widely discussed in the industry organizational literature, Judo economics presents a distinctive view that a smaller firm is not always at a competitive disadvantage. Indeed, this view is extended and elaborated in the business strategy context as is evident in the paper by Yoffie and Kwak [1].

Consider a market with two firms, selling a homogenous product to a group of buyers. Since both firms are already entrants, we only consider the stage of the game where the entrant, in this case *Hancom*, sets price and quantity and the next stage where the incumbent, in this case *Microsoft*, sets a responding price to either counter or accommodate *H*, depending on which would be more profitable.

Once *Hancom* sets its price and quantity, *Microsoft* will either counter-attack or accommodate. They would fight if the profit from accommodating is less than the profit from counter-attacking.

$$\prod_{1a} \leq \prod_{1p}, \qquad \prod_{1a}(P_1 > P_2) = (P_1^* - C_1)[D(P_1^*) - Q_2],$$
$$\prod_{1p}(P_1 = P_2) = D(P_2)(P_2 - C_1)$$

where $\prod_{1p}$ denotes the incumbent's profit if it chooses to prey; $D(P_2)$ refers to the demand function for the product at price P_2; C_1 represents the marginal cost of the incumbent to produce one unit of item. Where P_1^* denotes the monopoly price chargeable by the incumbent; Q_2 is the number of customers with the highest valuations gained by the entrant.

Similarly, the entrant would choose to enter the market, if and only if, the expected profit for the incumbent from accommodating exceeds the expected profit from preying:

$$E(\prod_{1a}) \geq E(\prod_{1p})$$

where the response functions of the incumbent (R_1) will yield the profit of $\prod_{1a}$. If the incumbent chooses to prey, the entrant will make zero profit and incur a fixed entrant loss. Since, in this game, information is perfect, $E(\prod_{1a}) = \prod_{1a}$ and $E(\prod_{1p}) = \prod_{1p}$.

Thus *Microsoft* has so far chosen to accommodate *Hancom*. On its part, *Hancom* has priced itself at KRW 151,000, which is close to *Microsoft*'s price of KRW 157,200. As long as *Hancom* makes it evident that they do not have ambitious goals is for market share and the profit margin remains the same for *Microsoft*, it appears that there is enough room for both companies in the South Korea word-processing market.

5. Discussion

A characteristic feature of the software market is the competition for market dominance. Unless the competing software is perfectly compatible, firms have to face a competition typified by a winner-takes-all situation. As opposed to most prior studies that have focused on market competitions, e.g., the browser war, in the US, our research traced the competition history of two firms between 1998 and 2003 in South Korea, which has a high level of IT proliferation. Our study split the competition into four landmarked stages spanning 7 years. Such a case analysis suffers from a limitation of case study research: the degree to which generalization of the findings is possible. However, we believe that our

findings explain some key phases of real-life competition. Notwithstanding this concern, this study is one of the first to examine software competition between a local incumbent and a strong foreign entrant in the Asian context.

The implications of our study flow from the observations and rationalization of the events of a software competition over a 7-year period. First, we were investigating competition between a domestic incumbent and a foreign new entrant with strong financial capital. The competition was further complicated by the incumbent firm enjoying strong support from its customers who felt national pride in the product.

Such a sense of social and national loyalty to a domestic firm is not unique to South Korea. To this end, we provided further suggestions to firms contemplating expanding their reach to different countries: take special consideration of a sense of loyalty and affiliation to a domestic firm. Our findings could enhance understanding of the nature of competition and the influential effects of different long-term business strategies on marketing success.

A primary reason for choosing to study word-processing software competition in South Korea was that the loyalty of its citizens, making market entrance more challenging. Indeed, *Microsoft* had to spend several years of effort in understanding the culture and consumer needs before creating a product that better met local needs.

Essentially, the rapid change in and development of global software market conditions and the rise of various new entrants provided us with more opportunities to understand the success and failure of software firms in a market characterized by price, quality, network effect, and product loyalty. To this end, our study provided a profound understanding of software market competition in Asia, a part of the world characterized by fast economic growth and large market potential.

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