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Application Service Program (ASP) Price Elasticities

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Abstract

Although the price elasticities for off-line industry are well documented in academic field, the report of price elasticities for on-line to a given brand or industry in practice have been relatively rare. The researcher aims to try to full this gap by applying a price response function to Home Trading System's on-line transaction data for the first time in Korean securities market. The different price elasticities among seven brands were found from -0.819 to -1.811. These results suggested that marketers should understand the price elasticity of their own HTS, before making a price decision.

Keywords: *Price, Price Elasticities, ASP, HTS, Decision*

1. Introduction

The study for pricing elasticity is not a new subject. If we look at previous studies by four criteria: “Who”, “Where”, “What”, and “How” for price elasticity, we are easily recognize that a number of study materials have been accumulated.

Firstly, in terms of “Who”, so many studies for identifying high and low price elasticity groups have been conducted (Darin 1987; Ku and Kim 1999). The main purpose of these studies implements different pricing policy; price discount for a high price elasticity group and price increase for the low (Simon 2009).

Secondly, study with respect to “When” is associated with product life cycle and price elasticity. As a product reaches from introductory to growing or mature period, price elasticity is getting lower. Finally, at decline period, price elasticities is getting higher. Therefore, this study is useful to derive an optimal period of pricing strategy like price increase or decrease, when time goes by. In addition, study about price elasticity gap between a slack time and prosperity has been executed. And in a depression season price elasticity is usually high. Furthermore, there is a dynamic price response function derived by tracing price sensitivity with time variable (Simon 1989).

Thirdly, study in light of “Where” is that price elasticity is different by country or region. Mainly, price elasticity is different by urban and rural or area despite same products (Darin 1987; Ku and Kim 1999).

Fourthly, study for “What” is that price elasticity is different by product cluster and brand, which is to report difference of price elasticity between durables and non-durables (Simon 1989).

Fifth, study of “How” is about size of price elasticity in itself. The study has been carried out that in spite of same products, price elasticity between expensive and cheap price is different (Kwak, Hong, and Paik 2001). Also, changes in sales volume at the same level of price increase or decrease are different.

A newly initiated subject among these prior researches about price elasticity hardly finds out, especially researches regarding subjects mentioned above have mainly implemented in German-spoken areas, yet in recent the number presented as research outcomes in German has been declined.

However, the new study subjects for price elasticity have been made by the development of recent online industry. Numerous platforms generating revenue through on-line have been set up and developed. For instance, consumers pay mobile bill for use of their service in mobile industry, and contrarily companies make revenue. Online communication sales like TV home-shopping has been occurred and costumers trade stock or bond on-line by using Home Trading System, provided by securities companies. The HTS is ASP (application service program) that costumers pay fees for use of service of a company program. Furthermore, a company sometimes receives lending fees for a web-hard.

Even though there are a variety of online prices and revenues biz model, the relation between the price and revenue or price and sales volume, price elasticity, haven’t been yet reported for on-line. The researcher aims to try to full this gap by applying a price response function to Home Trading System’s on-line transaction data for the first time in Korean securities market. Through that, we can not only academically accumulate researches of price elasticity, but also practically get information about price elasticity for each brand manager in industry field.

2. Modeling

Price elasticity is defined as change in price in comparison to change in sales volume. For this measurement data of price changes is needed as a denominator and data of sales changes as a numerator. Depending on which price points are measured, price elasticity is different. Accordingly, price response function is introduced so that significant sales volume should be gauged for price elasticity measurement.

The relationship between alternative prices and the resulting sales quantity is called the price response function (PRF) (Simon, 1989). The price response function of a product or a brand is a tool to understand the effect of price on sales for a product or a brand (Kucher et al., 1993; Simon, 1989, 1992; Yoo, 1991).

There are two approaches to obtaining the price response function. The first approach is to calibrate the price response function with prices and types of promotion as independent variables and with the sales as a dependent variable when there are real sales data. The other approach is to ask customers’ purchase intention through consumer research. The conjoint analysis is appropriate for the research on customers’ purchase intention to obtain the price response function. In this study the first approach, using real data is employed as transaction data of HTS is analyzed.

The most systematic way to represent a price response function is by means of a mathematical equation. There are four types of price response function model: linear, multiplicative, attraction, and Gutenburg models. These four basic models are expanded into

21 transformed models. Table 1 shows four basic models. We apply the 21 expanded models to the transaction data and seek for the function to best explain the price and sale and use it to predict the future.

Table1.Four basic Price Response Functions

Model	Equation
Linear	$q = a - b\, p_i + p$
Multiplicative	$q = a\,(p_i/p')^{c}$
Attractive	$q = a_0 + a_i p_i^{b_i} / \sum_i a_i p_i^{b_i}$
Gutenberg	$q_t = a - b\, p_t - c_1 \sinh(c_2(p_t - p_t'))$

p_i= company's price
p_j= competitors' price
p'= average competitors' price
a, b, c_1, c_2= estimated variable

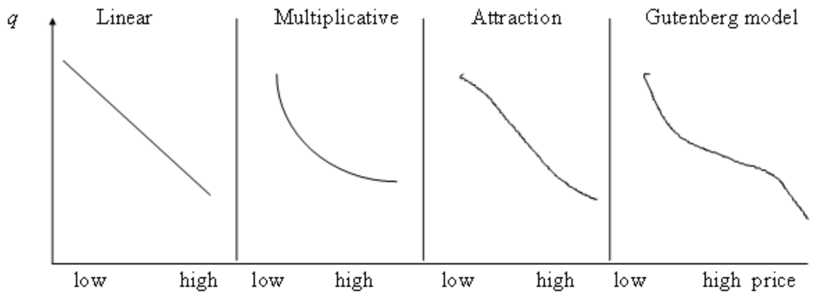


Figure1.The Shape of Price Response Functions

3. Methods

3.1 sample

Online transaction data was processed to generate price elasticity by brand. The data was used with the period from January 2007 to May 2008 in Korea. Major seven brands in Korea securities market have been used as research subject.

3.2 data analysis

In order to identify price elasticity on ASP for 7 brands, the analysis is conducted as follows. For pricing factor, the monthly market average price index is used for each brand and monthly average fees of 7 brands have been followed up every month. In order to calculate market average ASP price, the value yielded by average brand fees times market share by brand is divided by total market share of 7 brands.

In the second stage, we need sales volume data for the study. We regard monthly transaction volume of 7 brands as sales volume.

Market share of brand on May 7th, 2008 for seven brands is 21 percent. On May 2008 the number of securities firms which have entered a Korean securities market is 53, so major seven securities firms are the subject of this research.

The third stage is to yield price response function. For that, dependent variable of price response function is monthly sales volume and independent variable is the size of average fees of each brand, compared to monthly market average ASP price. This independent variable is defined as relative ASP Price by brand.
If the relative ASP price index is high than 1.0, it indicates that a brand has higher price than market average price. If the ASP price index is lower than 1.0, it indicates that a brand has lower price than market average.

The fourth stage is to yield price elasticity of each brand. The lowest and highest fees of each brand are found out during the research period, and then estimated sales volume is yielded by applying the two fees into price response function of each brand.

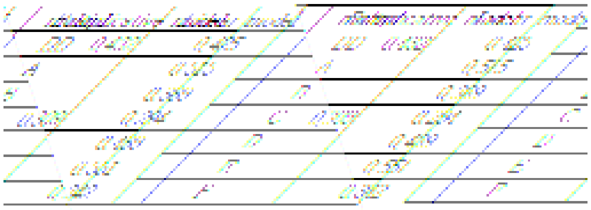
A percentage of change in price between minimum and maximum price is used as a denominator and a percentage of change in estimated sales volumes in minimum price and maximum price is used as a numerator in order to calculate the price elasticity.

4. Findings and Future Study

4.1 Forms of Price Response Function for Brand

Four types of price response function model are applied to the online transaction data: linear, multiplicative, attraction, and Gutenburg models. Linear function displays the most reliable in 6 brands of 7 brands and multiplicative function is more reliable that other 3 functions in only one brand. The R^2 of the price response function for 7 brands are showed as table 2.

Table2.R^2 for each Brand



4.2 Price Elasticities for Brand

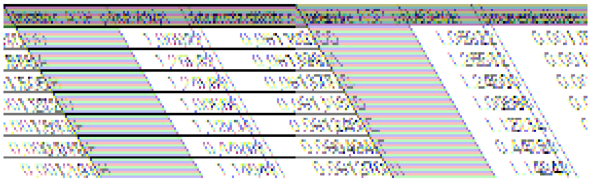
The highest and lowest prices points for 7 brands are as table 3. These two price points are applied to price response function for each brand.

Table3.Minimum and Maximum Price for each Brand

brand	min. relative ASP price	max. relative ASP price
DD	0.925	1.114
A	1.057	1.357
B	1.080	1.355
C	0.915	1.081
D	0.931	1.150
E	0.447	0.658
F	0.971	1.189

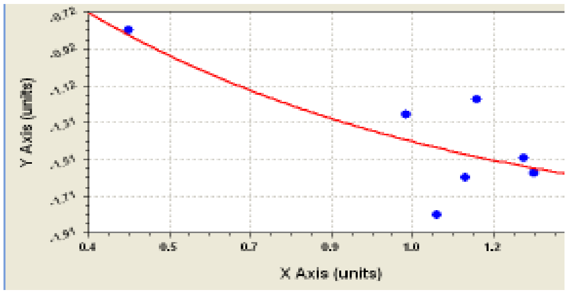
Based on table 3, price elasticity is yield and the results are as follows. The lowest price elasticity among 7 brands is -0.819 and in case price decrease is carried out, there is a brand which can not be expected revenue increase, compared to absolute value of price decrease. On the contrary, the highest price elasticity is -1.810. Absolute values in 6 brands of 7 brands are greater than -1, which means that 6 brand managers can expect increase of sales volume by price decline. Especially, online trading system is featured not to make additional costs every transaction as a variable cost, so it is appeared that any brand which is its absolute value is larger than -1 does yield more profits by decreasing their price if response of competitors does not response at price decrease.

Table4.Price Elasticity for each Brand



If price elasticity is displayed by comparing relevant market price, this is as figure 2. As seen at the figure, brands which are relatively higher price generally appear high price elasticity and brands which are comparatively low price appear low price.

In other words, it is appeared that brands having expensive fees can enjoy profits due to its revenue growth in spite of price decline. On the other hand, it is shown that brands having cheap fees as price obviously lose profits as its revenue does not elastically grow in spite of price decline.



Where
x axis = relative ASP price
y axis = price elasticity

Figure2.Plot of Price Elasticities by Brand

4.3 Future studies

This study is a descriptive report for on-line price elasticity which relatively has less performance than that of off-line. The subject is for price elasticity of Home Trading System in Korean securities market, which is one of online price. By utilizing DB of online securities trading system from Jan. 2007 to May 2008 price elasticities of 7 brands are measured by price response function.

As a result, price elasticity in 6 brands of 7 brands is greater -1, and so it is called "sensitive brands", yet one brand, getting the lowest fees appears the lowest price elasticity. The practical contribution of this study is to suggest objective price elasticity for brands to securities brand managers, that is, this can be specific materials that securities firms sometimes can refer to execute their functions as fees discount.

Simply, this study is for online stock trading of mature period on product life cycle. It is in need to be gauged price elasticity for option, futures, fund, and CMA, taking fees as ASP type. It is helpful to maintain profits of securities firms by periodically measuring price elasticity for various financial products.

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