EFFECT ON STOCK PRICE AND VOLUME OF INCLUSION IN OR EXCLUSION FROM KOSPI 200: COMPARISON WITH STOCK INDICES OF U.S. AND JAPAN

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Summary

This essay proves the negative slope of the demand curve of stocks after the event of inclusion in or exclusion from KOSPI 200 index. The environments of the stock markets in Korea, U.S. and Japan are very different from each other. By researching the inclusion in and exclusion from the stock indices documented in these countries, we have tested the efficient market hypothesis. In Korea, the stocks constituting top 50 in terms of total market value account for more than 90% of the overall market, creating the size effect. We were able to show that the demand curve for such stocks have lopsided downward. In the case of the exclusion, the long term demand curve also displayed similar negative slope. But, the bottom group has shown the reversal of the cumulative abnormal profit ratio. The reason for such reversion remains to be solved, but we have tried to prove through comparison of different conditions for the inclusion in the stock indices compared to those in the U.S. and Japan: it is related to the management performance of the Korean companies included in the index. On the other hand, the effect on the trade volume of the inclusion in and exclusion from KOSPI 200 turned out to be statistically insignificant, and the size effect did not exist, either. Only in the case of special changes, the trading volume before and after the day of such change has increased dramatically.

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I. Introduction

The purpose of this research is the analysis of impacts of the inclusion into or exclusion from the stock index of a certain stock on the price of the relevant stock. Under the efficient market hypothesis (EMH), which is one of the most fundamental assumptions of the financial theories, the market price of a stock is determined by its inherent value and, therefore, the changes in the supply or demand caused by trades by investors do not affect the stock prices. Such hypothesis leads to the conclusion that the large-scale purchase or sale of a stock, unless caused by changes in the inherent value of the stock, will not influence the price. In other words, the theory assumes that the demand function of stocks is a fully flexible horizontal one. Under the hypothesis, a certain event unrelated to the changes in the inherent value of a stock would not affect its price. Ultimately, we may conclude that an empirical research on the EMH would inevitably focus on the impact of a certain event unrelated to the inherent value of a stock on the stock price. In other words, the question should be whether the demand function of a stock with respect to a certain event is horizontal or not. This research, therefore, aims to unearth the effect of the inclusion into and exclusion from KOSPI 200, and the comparison of the results with those of the U.S. and Japan. An empirical research on the EMH vis-à-vis the inclusion in and exclusion from index was first suggested by Shleifer (1986). Shleifer (1986) tried to calibrate the negative slope of existing demand curves through the positive (negative) price reaction with respect to the large scale sale (purchase), but such evidences could also be explained by the information hypothesis – that a large scale purchase serves as a positive information on the affected stock, resulting in the price increase – and does not directly support the negative slope. On the other hand, there is an equally interesting question of whether the event of inclusion in and exclusion from the stock index is truly unrelated to the changes in the underlying value of the relevant stock. The growth of the index funds has resulted in the increased liquidity of a stock upon its inclusion into the stock index, and better disclosure of information which has reduced the information and transaction costs for investors. As a result, such trends tend to decrease the expected profit ratio of investors, thereby increasing the price of the relevant stock. According to the above opinion (the liquidity hypothesis) as well as a different opinion that such price increase is more related to the inherent value (the information hypothesis), a certain stock should satisfy a certain requirements (such as market representation, industry representation and liquidity, etc.) in order to be included in the share index. Thus, that a stock is included into the index signals to the market the undisclosed information that the

relevant stock has a quality profitability and inherent value. Therefore, such event would positively affect the share price. Ultimately, an event of inclusion into or exclusion from the stock index should not affect the share price, unless such information is related to the inherent value. Therefore, the subject matters of this research can be summarized as follows:

1. Test of negative slope of the demand function of stocks in Korea; and
2. Comparison of effects in Korea, U.S. and Japan.

The policy implication of the above issues on the Korean stock market is as follows: Korea has begun calculating the KOSPI 200 index beginning from June 1994, and the changes in the index are normally made as regular changes or special changes. The regular change of stocks constituting the index is made on the maturity day of futures falling in June, and the public disclosure of such change would be usually made about two weeks before such date. The special change, on the other hand, is usually made on the day immediately following the date of disclosure, without requiring any prior disclosure. By reviewing whether or not the meaningful impact of such changes on the share price would be found on the date of disclosure as experiences of other countries tell and, if not, when such effect takes place and how long it lasts, we would be able to reach a meaningful inference on the effect and transparency of the prior disclosure of the regular change.

Our analysis has led to the conclusion that in Korea, there is a certain level of size effect, and, if the group of stocks is subdivided into four equal parts based on the total amount of their market value, the price effect is meaningfully shown to be present only with respect to the top group. But, we were unable to find the trading volume effects. Such result deviates from the reports from the U.S. and Japan. By focusing on the criteria for changes of the constituents of the stock index, we were able to infer that such difference had been caused by whether the corporate performance is included as such criteria.

This essay flows as follows: In Chapter 2, we have reviewed the existing researches on the U.S. and Japanese markets, and presented the hypothesis on the impact of the inclusion into or exclusion from the stock index on the share price. Chapter 3 gives a brief introduction on the constitution and change of items constituting the KOSPI 200 index, the subject matter of this research. In Chapter 4, we have explained the event

study method adopted in this research, and in Chapter 5 the results of such approach. Finally, we have reviewed the results of the research and the policy implications.

II. Hypotheses

The impact of the event of inclusion into and exclusion from stock index on the share price is usually explained based on the following four hypotheses.

(1) Negatively Sloped Demand Curve Hypothesis—Imperfect Alternative Hypothesis

As we have mentioned in the Introduction, the research of the event of inclusion in and exclusion from stock index as an empirical analysis of the efficient market hypothesis was originally suggested by Shleifer (1986). Shleifer (1986), in his calibration of the negative slope of the existing demand curve, tried direct calculation of the negative (positive) price reaction to the large scale sale (purchase), but such evidence can equally be explained by the information hypothesis (that the large scale purchase functions as a positive information on the stock, increasing its price), and does not logically lead to the conclusion that the demand curve has a negative slope. Observation of the stock prices during the period from 1966 to 1983 of 144 and 102 companies each before and after 1976,[1] has shown about 3% unusual profit ratio[2] after the prior disclosure regime had been adopted, and after 1981 such unusual profit ratio has been positively correlated in a statistically meaningful way until about 20 days after the day of disclosure. According to Pruitt & Wei (1989), Chan & Lakonishock (1993) and Keim & Madhavan (1996), the hypothesis is supported, because the ratio of investment in the items constituting the index fund by the institutional investors is meaningfully increased and it has the large scale trading effects. According to such views, the demand curve necessarily takes the form of the downward slope because there is no perfect alternative of a certain stock, that the share price of those included in the index tends to rise and that such phenomena continue for a prolonged period of time. Lynch & Mendelhall (1997) and Benish & Whaley (1996) also supported this hypothesis. An analysis on the Nikkei 500 index by Liu (2000)[3] also supports it.

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[1] September 1976 is selected because the initial disclosure regime is adopted for S&P 500 index beginning from September 1976.
[2] Here, the unusual profit ratio means the excessive profit ratio under the market model.
[3] In this essay, studies on the Nikkei 500 is used as a Japanese studies because the items

(2) Negatively Sloped Demand Curve Hypothesis—Price Pressure Hypothesis

This hypothesis emphasizes that the demand curve for stocks exhibits the perfect elasticity in the long run, but takes the form of the negative slope in the short term. Harris & Gurel (1986), using the data on the excessive profit ratio[4] over the period similar to that adopted by Shleifer, proved that the effect of the inclusion in the index item on the prices tends to be restored to the level of those before the day of disclosure in about 3 weeks after the disclosure date. That is, his position is similar to the imperfect alternative hypothesis in the short term, but it shows the "price reversal" phenomenon—that is, such price tends to be restored to the originally balanced price. Lynch & Mendelhall (1997) also support this hypothesis—although weakly.

(3) Information Hypothesis

As mentioned in the Introduction, the information hypothesis states that, since a stock should satisfy certain requirements in order to be included in the stock index, from the perspective of the general investors, the event that a stock has been included in the stock index itself signals the market an undisclosed information that the relevant stock has good profitability and inherent value. Direct test of this view has been made by Dhillion & Johnson (1991). By researching the reaction of the call/put price and the bond price around the time of disclosure of the changes of the constituent stocks, they have reevaluated the negative slope of the demand curve. According to them, in the absence of a long term effect of changes in the stocks constituting the index, it will not affect the price of options with maturity in more than 3 weeks. Therefore, if the option price changes, it will at least contradict the price pressure hypothesis. Actually, they have observed the meaningful increment of the patterns of the profit ratio of stock options and bonds based on such hypothesis, refuting the price pressure hypothesis. In addition, they argued that practical considerations such as taxation and other transaction costs prevent the options and bonds being justified as an alternative for stocks. To conclude, the price impact on stocks included in the stock index can be efficiently

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constituting the Nikkei 500 had been changed 17 times between 1991 and 1999, and 6 expulsions had taken place due to the merger and acquisitions. Thus, we focused on the Nikkei 500 since the changes of the items constituting the index has taken place frequently.

[4] Here, the excessive profit ratio means the profit ratio in excess of the average profit ratio.

explained by the information effect, and therefore such event would be recognized as a positive signal on its inherent value. Thus, the price effect of the inclusion in the index can be explained as an information effect, and it should be read as a horizontal increase of the demand curve caused by the positive signal on the inherent value, rather than the price effect due to the downward demand curve. In other words, they argued that the efficient market hypothesis cannot be discarded in the end.

(4) Liquidity Hypothesis

Shleifer (1986) and Harris & Gurel (1986) both observed that at the time of disclosure of changes in the stocks constituting the index, such event had caused the meaningful increase of the trading volume or meaningful impact on the profit ratio. The same phenomena had been also observed by Pruitt & Wei (1989), Chan & Lakonishock (1993) and Keim & Madhavan (1996). According to their opinion, a stock item which had experienced a meaningful increase of investment ratio of index funds following the inclusion in the index reduces the transaction costs, lessens the demand profit ratio of investors and, as a result, its share price increases in a meaningful way. This hypothesis, however, is consistent with the negative slope hypothesis for the demand curves in a sense. The negative slope hypothesis for demand curves suggests that a large scale trading caused by a certain event apparently unrelated to the inherent value could have a certain price effect due to the negative slope of the demand curve, suggesting that the liquidity hypothesis can be interpreted so as to support the negative slope theory.

Based on the above discussions, we have organized below each of the hypotheses on the price effect of the inclusion in the stock index, the trading volume effect and the efficient market hypothesis.

<Table 1> Hypotheses on Price Effect of Inclusion in Stock Index

Category		Hypothesis on Demand Curve with Negative Slope		Information Hypothesis	Liquidity Hypothesis
		Imperfect Alternative Hypothesis	Price Pressure Hypothesis		
Price Effect	Short Term	Increase	Increase	Increase	Increase
	Long Term	Increase	No Change	No Change	No Change
Trading Volume		Increase	Increase	Increase	Increase
Opinion on Efficient Market Hypothesis		Discard	Long-term consistency	Consistency	Discard

The effect on the trading volume is intuitively clear, because the inclusion in or exclusion from the stock index is necessarily followed by the trading due to the changes in the portfolios of index funds. But, the views on the price effect differed depending on which hypothesis is to be adopted. Of course, all hypotheses agree that the inclusion accompanies the short-term price increase. However, only the information hypothesis claims that such increase is related to the inherent value. In other words, all hypotheses other than the information hypothesis presented experiences and opinions that in one way or another contradicts the efficient market hypothesis. Furthermore, on the long-term persistence of the price effect, the imperfect alternative hypothesis greatly differed from other hypotheses. Ultimately, all hypothesis excluding the information hypothesis assumed that the inclusion in or exclusion from the stock index is unrelated to the inherent value, and focused on the downward slope of the demand curve, and concentrated their researches on whether the effect would be long-term or not.

III. Configuration and Change of KOSPI 200

1. Overview

KOSPI 200 is a stock index developed to function as the subject matter of trading of index futures and index options. It is comprised of 200 items as constituting stocks chosen from all stocks listed on the stock exchange to qualify as the target of trading of futures and options, based on consideration of market representation, industry

representation and liquidity.[5] Setting the index as of January 3, 1990 at 100p, KOSPI 200 began being calculated and announced from June 15, 1994.

2. Selection of Constituent Items

For the selection of the constituent items, all stock items listed on the stock exchange are classified into 8 industry groups in accordance with the industry category generated by the Korea Stock Exchange based on the Korea Standard Industry Category, excluding, however, the industry group whose total amount of market price is less than 1% of the total amount of overall market price in order to enhance the total amount of market price of the stocks constituting the stock index. In addition, those stock items excluded from the population include those items newly (or re-) listed on or after the first opening day of May of the year immediately preceding the year on which the regular review day falls, those items subject to the court receivership as of the regular review day, stocks of the securities investment companies, items subject to the sale for the company reorganization and those deemed inappropriate for inclusion as the constituent items. All industry groups other than the manufacturing as classified in accordance with the industry group category will be classified as the "non-manufacturing" and will be given priority in the selection of the constituent items, and all others will be selected from the manufacturing industry. The basis data for the selection of the constituent items will be the average yearly market price, which is calculated by dividing the total market price—which is calculated by multiplying the closing price of common stocks as of the last trading day of every month for one year up to the end of April of the year in which the regular review day falls by the number of listed common shares—by twelve, along with the daily total trading volume for the same period. The stock items which had undergone the change of the industry group due to change of business or merger during the analyzed period will be classified as the industry group after such change.

First, we will review the method of selection of the non-manufacturing items. The selection is made in the order of the monthly average market price for each industry group, and those whose cumulative market price representing 70% of the total market price of the industry group will be selected. And, the number of items thus selected will be the number of constituent items of the relevant industry group. However, those

[5] The selection and change of the index items is made by the Committee on Management of Futures and Options Indices.

items which, although satisfy the total market price test, have the yearly trading rankings of less than 85% of all of the constituent items of the relevant industry group will be excluded, and substituted for by the item which has the next total market price but satisfies the trading volume criteria.

In the case of the manufacturing industry, the constituent items will be selected only for the number of items representing 200 minus the number of constituent items for the non-manufacturing industries. Here, the selection will be made in the order of the total market price, provided that 70% threshold of total market price is not used, but only 85% test of trading volume will be adopted. Even those items which fail to satisfy the criteria for selection of the constituent items, if they rank within top 50 in terms of the total market price of the relevant item, may be selected as the items constituting the KOSPI 200 index by the selection committee considering the relative significance of the industry group and the liquidity.

3. Change of Constituent Items

The constituent items of the KOSPI 200 index may be changed through the regular change or the special change. The regular change is made once every year on a regular basis so that the index may be calculated based on the changed items on a trading day immediately following the final trading day of the futures and options with maturity on June. On the other hand, the special change is made from time to time if a constituent item turns out to be inappropriate as the item constituting KOSPI 200 due to cancellation of listing, designation as regulated item, merger or other similar reason.

In the case of the regular change, the items are selected in a way identical to the method of selection of the constituent items, with certain restrictions designed to permit as little change of items as possible so as not to interfere with the continuity of the index. In other words, an item—even though it satisfies the criteria for selection of the constituent items—should have the ranking of total market value in the relevant industry group of 90% of the constituent items in order to be newly selected as a constituent item of the KOSPI 200. On the other hand, a constituent item—even when it fails to satisfy the criteria for the selection—would remain as such unless its ranking of total market value in the relevant industry group falls outside 110% of the constituent items of the industry group. Further more, even if there is an item which satisfies the 90% criteria cannot be newly added in the absence of an item expelled from the constituent items due to its

falling outside the 110% criteria.

In the case of the special change, if a constituent item suffers from the designation as the regulated item, merger, cancellation of the listing or other event of special change, such special change would be made item by item in the order of ranking of candidate items predetermined during the time of the regular change. In the absence of the candidate item in the relevant industry, the item will be selected from the manufacturing industry.

Even before the day of regular review, if an item with the higher weight of total market value in the stock market and rich liquidity is newly listed, or a company constituting the existing constituent item is taken over by another company, or several companies constituting existing constituent items are merged to form a new company, then the relevant company or the surviving company may be selected as a constituent item of the KOSPI 200 index. The time for the inclusion in the index of such specially selected items is the day falling after 30 days from the day of initial trading after the listing, which is the trading day immediately following the final trading day occurring simultaneously with respect to the futures and options with the maturity on the most recent month. In such a case, the item to be expelled from the index shall be the one with the least total market value on the most recent regular review regardless of the industry group, and such expelled item shall rank first from the candidate items for the relevant industry group.

4. Criteria for Change of S&P 500 Index

For the reference and comparison, we have briefly described the criteria for change of items constituting the S&P 500 of the U.S. The criteria for the inclusion are:

(1) Company with the U.S. nationality;
(2) Appropriate level of liquidity and reasonable price—the ratio of the currency value in which the item is traded vis-à-vis the total market value shall be 0.3 or higher;
(3) Total market value of 4 trillion dollars—subject to the adjustment depending on the market situation;
(4) A company with surplus operation income for 4 quarters consecutively as normally reported and the financial growth potential;

(5) A company with 50% of its equity shares or more open for public investments;
(6) Industry adjustments in order to balance with each indices in accordance with the GICS industry categories; and
(7) A company which is not a closed-end fund, a holding company, an investment company or a royalty trust, etc. (an operating company), but it may be a real estate investment trust

A company will be excluded if it is subject to the merger or the company reorganization to the level it cannot satisfy the inclusion criteria, or a company which potentially cannot satisfy one or more of the inclusion criteria.

5. Criteria for Change of Nikkei 500 Index

Nikkei 500 Index is an index calculated based on the items traded on the Tokyo Stock Exchange (TSE), after weighting in accordance with the relevant price. The change of items constituting the Nikkei 500 Index is made regularly on the end of March every year, based on the trading volume for three years, the trading value and the total market value. The criteria for the change are basically similar to those for KOSPI 200 of Korea.

IV. Research Methodology

1. Data

The data for this research is the KOSPI 200 Index. The KOSPI 200 Index was first calculated on June 1994, and from then until April 2003 total of 542 companies have been newly included or excluded.[6] Respectively 271 new inclusion and exclusion has occurred; 177 each during the regular change and 4 as a result of special changes, mostly caused by the exclusion event such as merger or cancellation of listing (see Table 2 below). In the case of the exclusion due to such special change, no stock price has been quoted since there was none anymore, or otherwise turned out to be inappropriate for the calibration of the direct effect of such exclusion. Therefore, we have limited our analysis to the regular changes. The futures trading with respect to the KOSPI 200 has begun from May 1996. Therefore, the analysis was focused on the period from June 1996 until December 31, 2002, until which day the data on the profit

[6] For details on the changed items up to April 2003, please see Appendix I.

ratio of changed stocks were available.

<Table 2> Classification Based on Event of Exclusion

Events	Number
Regular Change	177
Merged/Taken Over	26
Designation as Regulated Item	52
Cancellation of Listing	6
Others	10

Also, with respect to the regular changes, only the data for those with the disclosure date falling on or after June 2000 were available, so we have separated the period before and after January 1, 2000 for the analysis. Thus, for this analysis we have focused on, in the case of inclusion, 236 companies excluding those which were not traded around the day of disclosure of change and, in the case of exclusion, 158 companies out of 177 excluded during the regular changes excluding those which were not traded around the day of disclosure of change. The following shows the descriptive statistical data on the financial variables of the companies subject to the analysis.

<Table 3> Descriptive Statistical Data on Financial Variables of 4 Groups Divided Based on Total Market Value (Unit: %)*

Category (Inclusion/Exclusion)		Group 1	Group 2	Group 3	Group 4
Sales Operation Profit Ratio	Average	4.10/3.32	6.83/9.49	7.29/5.70	4.74/3.70
	Standard Deviation	9.53/3.05	14.83/17.42	7.84/8.93	11.45/8.58
	Median	5.41/2.49	6.66/5.56	7.14/4.98	6.74/5.32
Sales Increase Ratio	Average	7.36/7.00	3.37/6.97	13.18/-1.18	4.20/1.61
	Standard Deviation	22.92/22.82	29.65/32.23	30.55/24.82	27.44/28.67
	Median	10.42/9.02	3.10/10.88	15.56/-3.66	4.87/3.46
Equity Capital Increase Ratio	Average	12.14/12.68	9.67/9.13	10.35/15.30	8.70/-4.51
	Standard Deviation	37.92/16.68	37.19/32.48	23.33/38.28	26.18/36.64
	Median	5.98/5.25	6.16/9.68	9.69/12.45	6.07/-0.11
Stock Price Profit Ratio for 1 Month Before Day of Change	Average	-0.04/-0.76	-0.19/-0.10	-0.21/-0.29	-0.38/-0.14
	Standard Deviation	0.76/0.69	0.83/0.60	0.93/0.78	0.98/1.08
	Median	-0.29/-0.56	-0.15/-0.21	-0.36/-0.48	-0.40/-0.21

* Excluding those equaling 100% or more or -100% or less

2. Research Methodology

2.1 Calibration of Price Effects

We have adopted the basic event study method, calculating the abnormal profit ratio (AR) using the market model as follows:

$$AR_{ir} = R_{ir} - \widehat{\alpha} - \widehat{\beta} R_{m\tau}$$

Based on the AR calculated as above, the cumulative abnormal return (CAR) has been set as follows:

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}$$

And, based on the above two statistics, the horizontal AR and CAR have been set as follows:

$$\overline{AR_r} = \frac{1}{N} \sum_{i=1}^{N} AR_{ir}$$

$$\overline{CAR}(\tau_1, \tau_2) = \frac{1}{N} \sum_{i=1}^{N} CAR_i(\tau_1, \tau_2)$$

According to MacKinlay (1997), we can obtain the distribution of the horizontal AR and CAR as follows:

$$\overline{AR_{ir}} \sim N(0, Var(\overline{AR_{ir}}))$$

$$\overline{CAR}(\tau_1, \tau_2) \sim N(0, \text{var}(\overline{CAR}(\tau_1, \tau_2))$$

Where: $\text{var}(\overline{AR}_r) = \frac{1}{N^2}\sum_{i=1}^{N}\sigma_{\varepsilon_i}^2$, $\text{var}(\overline{CAR}(\tau_1,\tau_2) = \frac{1}{N^2}\sum_{i=1}^{N}\sigma_i^2(\tau_1,\tau_2)$, and

$\sigma_i^2(\tau_1,\tau_2) = (\tau_2 - \tau_1 + 1)\sigma_{\varepsilon_i}^2$.

To test the negative slope of the demand curve, let us consider the following period windows:

Windows	Explanation
Estimation window	Market model estimation window for 100 days until the day falling 20 days before the day of disclosure
Pre-event window	Day of disclosure -T ~ Disclosure day
Event window	Set as the period of after disclosure day + T period
Post-event window	Set as the period after the event window

In the above windows, the reaction upon inclusion in the stock index under respectively the price pressure hypothesis and the imperfect alternative hypothesis would be as follows:

Windows	Imperfect alternative hypothesis	Price pressure hypothesis
Pre-event window	CAR(0)	CAR(0)
Event window	AR(+), CAR(+)	AR(+), CAR(+)
Post-event window	CAR(+)	CAR(0)

As mentioned in the Section II, Hypotheses above, the reactions under the liquidity hypothesis and the information hypothesis should be identical with the imperfect alternative hypothesis. The focus, thus, is whether or not the cumulative abnormal return shows the positive profit ratio in the long run in a meaningful way. In other words, the question whether the long-term increase in the profit ratio is present upon inclusion in the stock index separates two representative hypotheses. Alternatively, upon exclusion the reaction should be the opposites of that upon inclusion.

2.2 Calibration of Effect on Trading Volume

Harris and Gruel (1986) has calibrated the effect on the trading volume as follows:

$$VR_{it} = \frac{V_{it}}{V_{mt}} \cdot \frac{V_m}{V_i}$$

Where, V_{it} is the trading volume of item *i* at the time *t*, and V_i is the average trading volume for eight months before the day of change. V_{mt} and V_m respectively means the trading volume of the market in general as of the time *t* and the average trading volume of the overall market for eight months before the day of change. The ratio is similar to the change of trading volume of item *i* vis-à-vis the change of trading volume of the market in general. In Korea, where the change of the index items occurs during the regular changes compared to the special ones and the regular changes are concentrated around the maturity day of futures falling on June, the trading volume of the overall market is larger around the day of change, with the effect that such trend is likely to be under-evaluated.[7]

For the calibration of the effect on the trading volume, let us adopt the horizontal average as follows:

$$MVR = \frac{\sum_{i}^{N} VR_{it}}{N}$$

V. Results of Analysis

5.1 Price Effect

If we apply the research methodology mentioned in Chapter 4 to all samples and all periods covered for the research, the resulting cumulative abnormal return around the day of change of the index is as appears in <Picture 1>.

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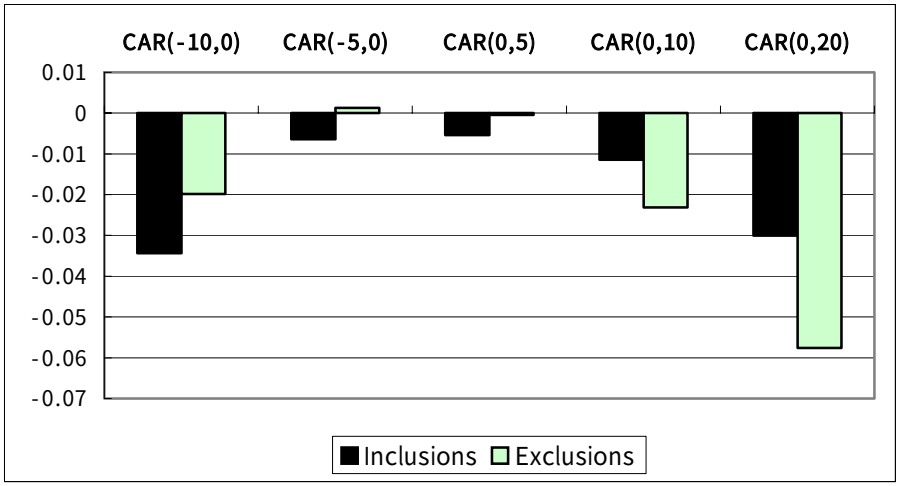
[7] We have used the formula $\frac{V_{it}}{V_i}$ in order to exclude the effect that the trading volume of the overall market tends to concentrate around the day of change, but the results show no significant differences. However, we have decided to follow the method suggested by Harris and Gruel (1986) to efficiently compare the researches on the U.S. and Japan.

<Picture 1> Cumulative Abnormal Return (All Periods/All Samples)



The above result shows the negative (-) cumulative abnormal return both in the inclusion and exclusion. Such result, however, may have been determined by the mixed elements. First, the disclosure data collected for this research covers the period after 2000. The cumulative abnormal return based on such data is as in the below table.

<Table 4> Abnormal Profit Ratio and Cumulative abnormal return upon Inclusion

	Period I (~1999/12)		Period II (2000/01~)	
	Average	z Value	Average	z Value
CAR(-10,0)	-0.0352	-3.4130	-0.0329	-2.0461
CAR(-5,0)	-0.0250	-3.2817	0.0222	1.8665
CAR(0,5)	-0.0141	-1.8534	0.0080	0.6754
CAR(0,10)	-0.0201	-1.9879	0.0025	0.1603
CAR(0,20)	-0.0432	-3.3028	-0.0099	-0.4462

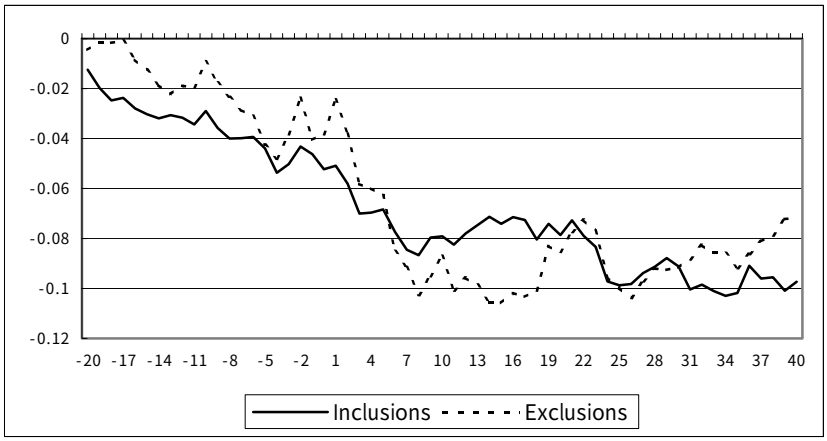
* $CAR(\tau_1, \tau_2)$: Cumulative abnormal return from τ_1 to τ_2 (as of the day of disclosure)

<Table 5> Abnormal Profit Ratio and Cumulative abnormal return upon Exclusion

	Period I (~1999/12)		Period II (2000/01~)	
	Average	z Value	Average	z Value
CAR(-10,0)	-0.0520	-3.6085	0.0217	1.1958
CAR(-5,0)	-0.0228	-2.1474	0.0325	2.4232
CAR(0,5)	0.0044	-0.4167	0.0047	0.3523
CAR(0,10)	-0.0297	-2.0625	-0.0147	-0.8081
CAR(0,20)	-0.0616	-3.0922	-0.0524	-2.0894

In the case of the inclusion in <Table 4>, while Period I showed the result opposite to the expectation, the cumulative abnormal return for Period II when CAR(-5,0) resulted in about 2.2% significant one. In the case of the exclusion in <Table 5>, the cumulative abnormal return turned out to be negative (-) from two weeks before the day of disclosure (as of the trading day), whereas during Period II the cumulative abnormal return has shown a long-term negativity (-) for a long period after the day of disclosure. The cumulative abnormal return as of the day of change of all samples is as appears in <Picture 2> below.

<Picture 2> CAR(-20, 40) of all samples*



* The cumulative abnormal return calculated as of the day of change of index

Characters of all samples ten days before the day of change in <Picture 2> do not show a big difference in the case of the inclusion and exclusion. Ultimately, <Table 4> and <Table 5> show for the period after 2000 the short-term excess return in the case of inclusion and the long-term negative (-) profit ratio in the long run in the case of

exclusion. This research has focused as the second combined reason for such results the size effect. In Korea, the ratio of the total market value of four equally divided total market value of items constituting KOSPI 200 reveals that the combined total market value of those ranked 50 or higher accounts for about 90% of the total market value ratio, as appears in <Table 6>.

<Table 6> Total Market Value Ratio of Items Constituting KOSPI 200 Index as of Day of Regular Change on June 14, 2002[8]

Total Market Value Ranking	Total Market Value Ratio
1^{st}~10^{th}	61.04%
11^{th} ~50^{th}	28.33%
51^{st} ~100^{th}	7.68%
101^{st} ~150^{th}	2.09%
151^{st} ~200^{th}	0.86%

Source: Korea Stock Exchange

As reviewed in the Hypotheses, the inclusion in or exclusion from the stock index, in order to affect the price, should be supported by the large scale sale/purchase trading by the index funds. But, it is unlikely that the items falling below ranking 50—whose ratio of index fund participation are relatively lower—should have such impact on the price. Therefore, in order to consider the size effect, we have divided all samples to four subgroups depending on the total market value for the analysis. Here, the first group is composed of those ranked 1^{st} to 50^{th} in terms of the total market value, the second group thereafter to 100^{th}, the third group from 101^{st} until the 150^{th}, and the final fourth group from 151^{st} to 200^{th}. <Table 7> to <Table 8> below show the statistics of the cumulative abnormal return for each such group.

<Table 7> Cumulative abnormal return of 1^{st} Group (Total Market Value Ranking of 1^{st}

[8] The top 50 in the overall stock exchange market accounts for about 80% of the total market value.

to 50th)

	Period I(~1999/12)				Period (2000/01~)			
	Inclusion(17)*		Exclusion(3)		Inclusion(11)		Exclusion(0)	
	Average	Z Value	Average	Z Value	Average	Z Value	Average	Z Value
CAR(-10,0)	0.0565	2.1933	-0.1532	-2.1058	-0.0058	-0.1054	-	-
CAR(-5,0)	0.0425	2.2373	-0.0951	-1.7707	0.0382	0.9379	-	-
CAR(0,5)	-0.0114	-0.6011	0.0068	0.1270	0.0224	0.5498	-	-
CAR(0,10)	-0.0144	-0.5584	-0.0231	-0.3182	-0.0066	-0.1204	-	-
CAR(0,20)	-0.0184	-0.5188	-0.0110	-0.1094	-0.0011	-0.0145	-	-

*() is the number of samples.

<Table 8> Cumulative abnormal return of 2nd Group (Total Market Value Ranking of 51st to 100th)

	Period I(~1999/12)				Period (2000/01~)			
	Inclusion (29)		Exclusion (17)		Inclusion (17)		Exclusion(15)	
	Average	Z Value	Average	Z Value	Average	Z Value	Average	Z Value
CAR(-10,0)	-0.0320	-1.3953	-0.0811	-2.8461	-0.0029	-0.0570	0.0718	1.4980
CAR(-5,0)	-0.0307	-1.8131	-0.0206	-0.9814	0.0474	1.2420	0.0813	2.2942
CAR(0,5)	-0.0143	-0.8453	-0.0267	-1.2692	-0.0084	-0.2216	0.0085	0.2417
CAR(0,10)	0.0058	0.2554	-0.0526	-1.8469	0.0122	0.2379	-0.0444	-0.9261
CAR(0,20)	-0.0027	-0.0873	-0.0683	-1.7334	0.0061	0.0861	-0.0121	-0.1834

<Table 9> Cumulative abnormal return of 3rd Group (Total Market Value Ranking of 101st to 150th)

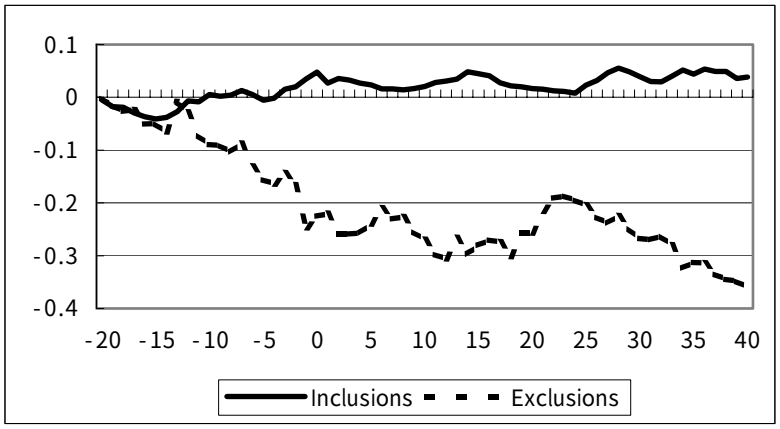
	Period I(~1999/12)				Period (2000/01~)			
	Inclusion(41)		Exclusion (22)		Inclusion (26)		Exclusion (10)	
	Average	Z Value	Average	Z Value	Average	Z Value	Average	Z Value
CAR(-10,0)	-0.0357	-1.9043	-0.1026	-3.7250	-0.0683	-1.5890	-0.0162	-0.2022
CAR(-5,0)	-0.0238	-1.7192	-0.0409	-2.0086	0.0281	0.8865	0.0290	0.4896
CAR(0,5)	-0.0117	-0.8509	-0.0023	-0.1169	0.0173	0.5448	0.0020	0.0349
CAR(0,10)	-0.0098	-0.5244	-0.0341	-1.2379	-0.0047	-0.1108	-0.0243	-0.3023
CAR(0,20)	-0.0359	-1.3859	-0.0245	-0.6444	-0.0171	-0.2886	-0.0863	-0.7771

<Table 10> Cumulative abnormal return of 4th Group (Total Market Value Ranking of 151st to 200th)

	Period I(~1999/12)				Period(2000/01~)			
	Inclusion (56)		Exclusion (47)		Inclusion (39)		Exclusion (43)	
	Average	Z Value	Average	Z Value	Average	Z Value	Average	Z Value
CAR(-10,0)	-0.0643	-3.6951	-0.0113	-0.5335	-0.0301	-0.8247	0.0163	0.4966
CAR(-5,0)	-0.0434	-3.3771	-0.0106	-0.6769	0.0027	0.1012	0.0198	0.8160
CAR(0,5)	-0.0165	-1.2864	0.0019	0.1240	0.0049	0.1849	0.0056	0.2331
CAR(0,10)	-0.0438	-2.5180	-0.0198	-0.9330	0.0058	0.1601	-0.0007	-0.0216
CAR(0,20)	-0.0769	-3.1967	-0.0797	-2.7178	-0.0146	-0.2896	-0.0570	-1.2571

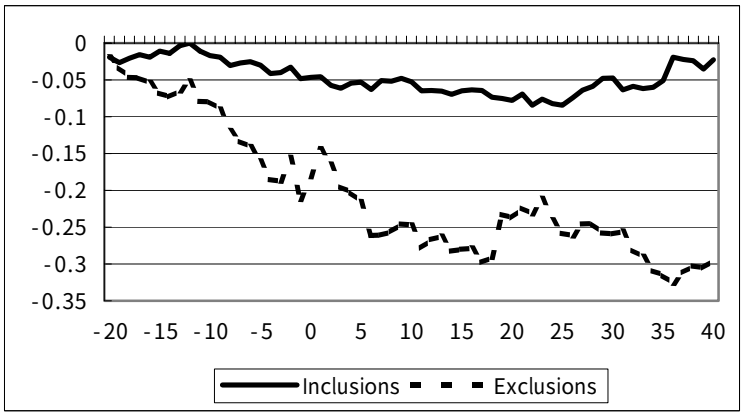
On the other hand, <Picture 3> through <Picture 6> below each shows the cumulative abnormal return of each group. They are also the cumulative abnormal return calculated based on the day of change.

<Picture 3> CAR(-20, 40) of Group 1

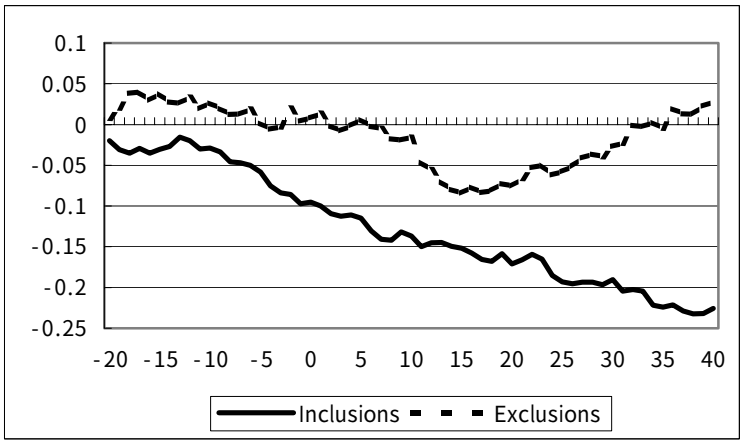


<Picture 4> CAR(-20, 40) of Group 2

<Picture 5> CAR(-20, 40) of Group 3



<Picture 6> CAR(-20, 40) of Group 4



As shown in the above tables and pictures, the size effect existed. First, <Table 7> shows that in the case of inclusion and exclusion of items constituting Group 1, the expected effect (negative/positive) took place from two weeks before the day of disclosure in the Period I. In other words, it proves that the negative demand curve hypothesis suggested in Section, Hypotheses, cannot be discarded in the end. But, the same effect did not appear in Period II. And, Groups 2 through 3 did not show any specifically meaningful phenomena. However, the results for Group 4 greatly differ from other groups. In the cases of inclusion and exclusion for Period I, the results (positive/negative) were direct opposite of those expected. The picture above also shows similar results. <Picture 3> through <Picture 6> display the cumulative abnormal return from the day falling one month before the day of change. Group 1, although meaningful to a lesser degree than Group 3, showed higher cumulative abnormal return in the case of inclusion vis-à-vis exclusion. The phenomena, however, are reversed in the case of Group 4.

Yet another explanation for the combined results of the overall sample is related to the fact that there are two types of change of KOSPI 200 items: regular and special changes. The regular change can be better predicted before the day of disclosure, but the special change is more likely to be unpredictable compared to the regular change. Thus, the price effect in the case of the special change is more likely to be mixed with noises. In order to test whether the reversal in the case of Group 4 is noised or not following the type of the change, we have separated the regular change from the special one for the analysis. <Table 11> through <Table 12> shows the Groups 1 and 4 during Period I depending on the type of the change. There existed no meaningful phenomenon in Groups 2 and 3. <Picture 7>, on the other hand, shows the CAR in the case of the regular change without distinction according to the groups.

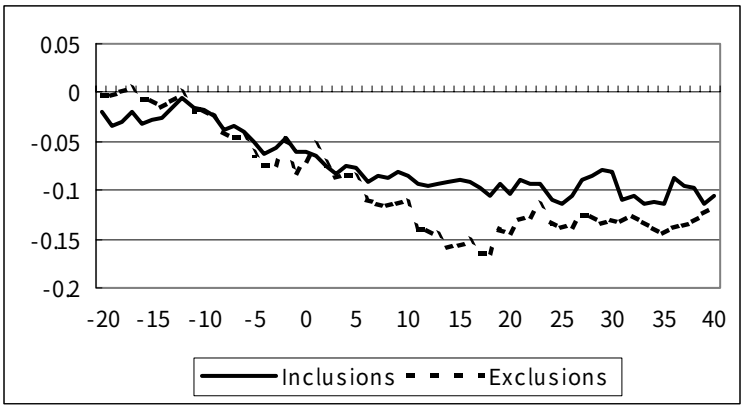
<Table 11> Cumulative abnormal return of Group 1 (Distinguished in Terms of Type of Change)

	Regular Change				Special Change	
	Inclusion (15)		Exclusion (3)		Inclusion (2)	
	Average	Z Value	Average	Z Value	Average	Z Value
CAR(-10,0)	0.0664	2.4933	-0.1532	-2.1058	-0.0182	-0.0599
CAR(-5,0)	0.0541	2.7508	-0.0951	-1.7707	-0.0444	-0.1977
CAR(0,5)	-0.0052	-0.2662	0.0068	0.1270	-0.0578	-0.2579
CAR(0,10)	0.0002	0.0094	-0.0231	-0.3182	-0.1241	-0.4086
CAR(0,20)	0.0084	0.2283	-0.0111	-0.1094	-0.2200	-0.5240

<Table 12> Cumulative abnormal return of Group 4 (Distinguished in Terms of Type of Change)

	Regular Change				Special Change	
	Inclusion (22)		Exclusion (47)		Inclusion (49)	
	Average	Z Value	Average	Z Value	Average	Z Value
CAR(-10,0)	-0.0988	-3.6127	-0.0113	-0.5335	-0.0419	-1.4640
CAR(-5,0)	-0.0433	-2.1448	-0.0106	-0.6768	-0.0434	-2.0524
CAR(0,5)	-0.0076	-0.3783	0.00194	0.1240	-0.0222	-1.0527
CAR(0,10)	-0.0568	-2.0782	-0.0198	-0.9330	-0.0354	-1.2346
CAR(0,20)	-0.1127	-2.9826	-0.0797	-2.7178	-0.0536	-1.3547

<Table 7> In the case of Regular Change



Even in Period I where the day of disclosure is uncertain, the regular change is more

predictable than the special change. In the case of inclusion for Groups 1 and 4 both, the special change did not show any meaningful phenomenon, but the regular change distinctly shows a meaningful difference. However, the reversal of the cumulative abnormal return in the case of inclusion compared to exclusion for Group 4 still remains. Both Groups 1 and 4 fail to show any meaningful cumulative abnormal return pattern with respect to Period II.

Then, what is the reason why the inclusion in Group 4 has such negative effects? In pursuit of the answer to the question, we have divided the items newly included, items excluded and the remaining ones as of the time of the inclusion and exclusion into each group (categorized in terms of the total market value), and researched the management performance for each group calibrated as the changes in the ROE.

<Table 13> Statistics of Changes of ROE of Each Group

- Median

	Group 1	Group 2	Group 3	Group 4
Inclusions	0.00045	-0.01011	-0.00571	-0.01174
Exclusions	-0.01046	-0.00593	-0.01812	0.00320
Remaining	-0.00608	-0.00354	-0.00927	-0.00795

- Average*

	Group 1	Group 2	Group 3	Group 4
Inclusion	0.00193	-0.00754	-0.00951	-0.03081
Exclusion	-0.01046	-0.00718	-0.00176	0.00222
Remaining	-0.00783	-0.01030	-0.01541	-0.01748

* We have used the sample within 2 standard deviations.

<Table 14> ANOVA Table

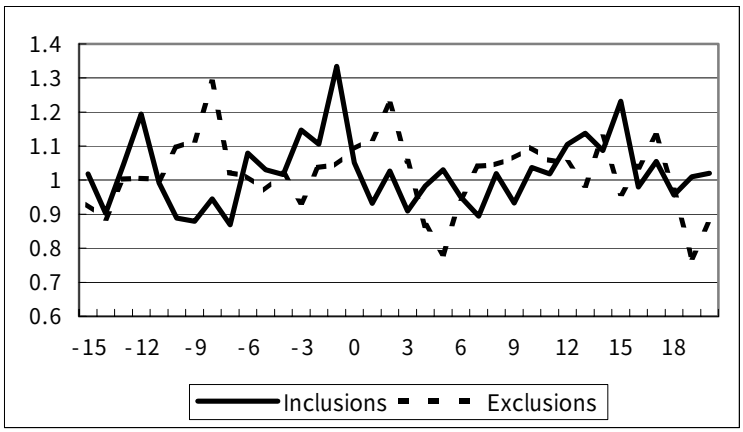
	SS	DF	MS	F	p-value
Distinction of Inclusion/Exclusion	0.0177	2	0.0088	8.0283	0.0003
Distinction of Total Market Value	0.0132	3	0.0044	3.999	0.0076
Interaction	0.0178	6	0.003	2.6955	0.0133
Inter-Group	0.0487	11	0.0044	4.0206	0.0000
Error	1.1042	1002	0.0011		
Total	1.1529	1013			

The above tables show that, if we focus on the median or the average, Groups 1 through 3 show bad management performances in the case of exclusion, whereas Group 4 showed the opposite. In other words, Group 1 showed average change of ROE of 0.2% increase in the year in which their stocks were included, 1% decrease in the case of exclusion and 0.6% decrease in the case of remaining items. In the case of Group 4, although the ranking was similar to Groups 2 and 3, the trend is reversed. The items newly included shows the average 3% decrease of the ROE, and those excluded showed a 0.2% increase. For the test of the meaningfulness of such results, we have used the 2 circle ANOVA. The inter-group difference of averages and the difference of the changes have significance, as well as the interaction between the total market value groups and the change distinctions. In other words, an interaction effect has taken place between the different total market value groups of items not subject to the inclusion, exclusion or any other change so that, it appears, the meaningful change in the ROE has resulted. Such phenomenon can be explained as follows. In the case of Group 4, the change takes place frequently and is almost unrelated to the inclusion in the index fund. Thus, the inclusion or exclusion is not greatly reflected in the market. Rather, in the case of Group 4, the inclusion may take place despite the relevant company's bad management performance because of a temporary increase in the ratio of the total market value, triggering the re-evaluation by the market after such event. Alternatively, the selection of the items constituting the index is made based on the total market value, largely ignoring the profitability of a company. Therefore, it appears that, in the absence of an event of inclusion in the index fund, the market recognizes such company as the one whose profitability has been decreased.

5.2 Effect on Trading Volume

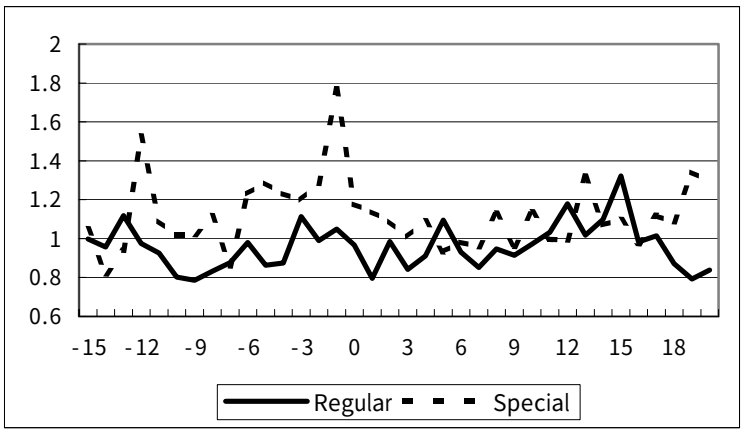
There appears to be no meaningful effect on the trading volume in Korea. Only in the case of the special change, there is a meaningful change of the trading volume around the day of change. First, <Picture 8> shows the MVR trend of the items included and excluded from the day falling fifteen days before the day of change to the day falling twenty days after. In the case of the inclusion, the increase of the trading volume precedes by 2—3 days compared to the exclusion. But, such increase is without any statistical significance. Also, there existed no meaningful difference in terms of the trading volume for each of the total market value groups.

<Picture 8> MVR of Items Included and Excluded



However, as is shown in the price effect, the effect tends to be already reflected before the change in the case of the regular change. It may be read to mean that the information on the change has been reflected beforehand. Therefore, the abrupt increase in the trading volume will take the weak form in the case of the regular change. To test such effect, we have reviewed the MVR trend divided by the case of the regular change and the special chase upon inclusion.

<Picture 9> MVR in Case of Regular Change and Special Change



In the case of the special change, the trading volume has shown a meaningful change one—two days before the day of change of the index, whereas in the case of the regular change such rate fluctuates within 1% range. That is, the disclosure of the special change usually takes place two—three days before. Thus, we may conclude that the change in the trading volume takes place around the day of the disclosure.

5.3 Summary of Findings; Comparison with Price and Trading Volume Effects in U.S. and Japan

To summarize, if we apply the hypotheses test categories presented in Chapter III, Methodology, we can find that the size effect exists in the weak form of the negative slope demand curve. Further, we have confirmed that the effect is a long-term one. That is, in the case of the exclusion, all groups show the long-term negative (-) cumulative abnormal profit ratio, whereas with respect to the inclusion, only Group 1 shows the long-term positive (+) cumulative abnormal profit ratio. In other words, in the case of the inclusion only with respect to Group 1 the imperfect alternative hypothesis cannot be discarded. On the other hand, with respect to the exclusion, Pictures 2 through 5 shows that the imperfect alternative hypothesis stands valid.

In the case of the trading volume, only with respect to the special change the trading volume has increased in a meaningful way on the day of change. Such result greatly differs from those in the U.S. and Japan. In the U.S. and Japan, the effect did not exhibit a great difference in terms of the size of the company. In the U.S., the information hypothesis and the imperfect alternative hypothesis both remain value, mostly due to the fact that the options and bonds trading of the relevant item has rich liquidity. Furthermore, each hypothesis acknowledges that the event of inclusion in and exclusion from the stock index have a long-term effect on the inherent value, and they differ only in terms of whether they support the efficient market hypothesis or not. The Japanese case, however, supports the imperfect alternative hypothesis without any size effect.

On the above differences, considering that the management performance of a company is not included as one of the important considerations for the decision to change the stock index in Korea, this essay has focused on the lower 4 groups showing higher frequency of changes (including Groups 2 and 3) to test the possibility that a stock item could be included due to the temporary rise in the stock price or increase in its liquidity on the year of such change. We have concluded that, unlike the U.S. and Japanese stock markets, in the Korean stock exchange the ratio of the total market value of Group 1 is extremely high, which phenomenon—intermixed with other problems mentioned above—has resulted in the inapplicability of the role of the index fund for those falling in or below Group 2.

VI. Conclusion

The efficient market hypothesis has been supported or rejected by innumerable researches thus far. An event of inclusion in or exclusion from the stock index has a meaning not only as a test for the efficient market hypothesis, but also as a signal of the inherent value of the relevant stock. In the U.S., the analysis of the inclusion in and exclusion from the stock index has been reviewed periodically every five years. Such interest is caused partly by the changes in the disclosure regime, but mostly due to the ongoing interest in the long-term negative slope of the demand curve of stocks. For arbitrageurs, a negative slope of the demand curve of stocks would mean that, upon unusually large scale sale/purchase activities, such trend would trigger the price effect as suggested by the liquidity hypothesis or the negative slope demand curve hypothesis even in the absence of changes in the inherent value of stocks, and would serve as an incentive to engage in the long- and short-term trading. For the academic reasons stated above, this research has tried to test the negative slope of the demand curve of stocks in Korea around the event of inclusion in or exclusion from the KOSPI 200 index. In Korea where those ranked top fifty in terms of the total market value accounts for more than 90%, there existed a certain size effect, and the demand curve of stocks for the top groups tended to show the negative slope. In addition, in the case of the exclusion, the long-term demand curve also exhibited the negative slope. But, we also discovered that, with respect to the lower group, the cumulative abnormal return upon inclusion and exclusion tended to be reverse, which phenomenon we believe would serve as an important subject matter of a further study. On the other hand, through the comparison of the effects in Korea with those of the U.S. and Japan, this research has tried to show the existence of the size effect and the characteristics of the trading volume in the case of the stock index in Korea. This research has focused on the elements such as whether the criteria for the change includes the management performance or not, and the concentration of the total market value in the Korean stock market. Such elements, we believe, indirectly suggests the need for the enhanced liquidity for the Korean stock market.

Appendix I Details of Changes of Items Constituting KOSPI 200 Until December 2002

- Items Newly Included[9]

Year	Type of Change	Company Name
1995	Regular Change	Korea Zinc (49), Kia Besteel (128), Daenong (163), Daeduck Electronics (178), Daewoo Precision Industries (151), Dacom (22), Pusan Bank (85), Samsung Securities (55), Ssangyong Paper (165), Ssangyong Heavy Industry (144), Hana Bank (60), Korea Development Leasing Corporation (63), Hyundai Marine & Fire Insurance (91), Honam Petrochemicals (30), Hotel Silla (108)
	Special Change	Dongbang Yuryang (157), Rocket Electrics (175), Hanchang (144)
1996	Regular Change	Gyungnam Energy (179), Kookmin Bank (27), Gisan (117), Lotte Chilsung (141), Samsung Heavy Industry (18), Sungmi Electronics (125), Sewon (151), Sepoong (153), LG Industrial Systems (43), Chunggu (92), Cheongho Computer (96), Taechang (190), Hanguk Glass Ind. (173), KEB (14), Hanjin Marine Transportation (63)
	Special Change	Sambu Construction (97), Doosan Construction (105), Samyang Genex (170), Poonglim Industries (127), Korea Polyol (187), Sungwon Construction (148)
1997	Regular Change	Namhae Chemicals (71), Daesung Industries (86), Daehan City Gas (33), Samsung Fine Chemicals (83), Samsung Fire & Marine Insurance (26), Seoul City Gas (72), Seondo Electrics (78), Hankuk Electric Glass (132), Hankuk Carbon (105), Hankook Synthetics (123), Hanjin Heavy Industries (112), Hyundai Merchant Ships (48), Heungchang (144),LG Information Communication (16)
	Special Change	Haitai Electronics (182), Daeyong Electronic Industry (103), Woongjin Publication (153), Gyungnam (144), Iljin (173), Hansol Electronics (176), Kumho Electrics (190), Daeho (130), Asea Paper (159), Korea Fine Chemical (149), Iljin Electrics Industry (), Daesun Distilling (187), NK Telecom (178), Pulmuwon (190), Jinsung Remicon (157), Chosun Refractories (186), Hansol Chemicals (170), LG Fire & Marine Insurance (79), Gyungnam Bank (62)

[9] The number inside the bracket is the ranking of the total market value used for the analysis.

1998	Regular Change	Kukdong City Gas (105), Hyundai Industrial Development (38), Hyundai Trade (94), Daewoo Auto Sale (123), Hanjin (176), Korea Housing Bank (21), KTB (70), Gonghwa Bank (54), LG Semiconductor (6), Hyundai Electronic Industrids (8), Sindoricoh (25), Halla Climate Control (82), Kumkang (93), Medison (66), Hyundai Elevator (40), Gwangdong Pharmaceuticals (62), Fursys (107), Goryo Petro-Chemicals (141), Daeyong Packaging (133), Ildong Pharmaceuticals (177), Ottogi (139)
	Special Change	Shinhgwa Construction (177), Daeyu Trading (198), Dongbu Construction (184), Maxon Electronics (182), Daewoong Pharmaceuticals (151), Daehan Fire Insurance (115), Dongyang Fire & Marine Insurance (124), Hanmi Pharmaceuticals (124), Hyundai Mipo Shipbuilding (99), Kolon Trade (174), Shinwon JMC (198), Bukwang Pharmaceuticals (133), Daesung Electric Cables (172)
1999	Regular Change	Samwha Paint Industry (149),SK Securities (65), Samyang Trade (148), Korea Export Packaging (160), Korea Shell Petroleum (167), DI (173), Deoksung Chemicals (177), Binggrae (185), Samjin Pharmaceuticals (165), Samyoung Electronics (98), Heunga Tire (144), Isu Chemicals (96), Sempio Foods (196), Korea Circuit (137), Seohung Capsule (90), Willbes (100), Yulchon Chemicals (72), LG Merchant Bank (161), Daehan Aluminums (48), Shinmurim Paper (191), Saehan Fine Machinery (136), Goryo Chemicals (73), Cad Com (153), Enex (115), Taerim Packaging (168), Sungan (147),SKC(95), Kyeyang Electrics (143), Kyung-In Synthetic (156), Daechang Industries (186), AUK (123),Korea Safety Glass (142), Dongil Papers (154), Sewon Heavy Industries (139), Daewon Chemical (166), Korea Polyol (140), SJM(111), Mirae Industries (45), Pan Tec (105), Korea Kodenshi (198), KC Tech (112), Com Tech System (124)
	Special Change	Daewoo Electronic Parts (160), Dongbu Fire & Marine Insurance (121), Jeonbook Bank (137), Daeins (154), Korea Telecom (2), Dongsung Chemicals (155), Goryo Industry Development (92), Changwon Diesel (186), Kolon Construction (152), Dongbang (194), Woongjin Publishing (172), Daegu Bank (45), Seoul Securities (63), Korea Data Systems (180), Shinyoung Securities (68), KT&G (198), Hyundai Heavy Industries (197), Youngwon Trading (90), Shindaeyang Papers (165), Ewha Industries (175)
2000	Regular Change	S-1 (7), Dow Technologies (32), SK Trading (47), Cheil Communications (67), Hansol CSN (55), Samsung Fire & Marine Insurance (127), Kia Automobile (24), Daedeok GDS(98), Hitron Systems (104), Chemicals (114), Korea Fine Chemical (97), Kumho Electrics (117), Yuyang Information Communications (131), Maxon Electronics (140), Shinwon (184), Youngbo Chemicals (153), Hanil Ewha (112), DPC (158), Wooshin Industries (167), Pulmuwon (175), Hansum (160), Kumho Chemicals (162)
	Special Change	Deokyang Industries (146), Shinsung E&G (88), Korea Core (177), Cheil Engineering (196), Nexen Tire (181), Daeho (105), KTB Network (55)

2001	Regular Change	Korea Gas Corporation (15), Daeshin Securities (50), Jawha Electronics (80), Baeksan (91), Korea Petro-Chemicals (95), Gira Information Communications (151), NSF(153), Samae Indus (192), Samwha Paint (126), Kukdong Cables (135), Korea Computer (117), Kumyang (169), STX(162), DPI (179), Hwanin Pharmaceuticals (125), Dongguk Industries (136), Hwaseung R&A (157), Byuksan (163), Joongang Papers (152)
	Special Change	Hansung Corporation (160), Doosan Construction (100), Pyungwha Industries (168), Iljin Electrics (), KEP Electronics (172), Inzi Controls (185), Daeyang Steel (191), KNC(180), Kolon Construction (149), Doosan Tech Pack (175), Chogwang Pain (138), Taepyungyang Pharmaceuticals (147), Shinhan Financial Holdings (), Q&Tech Korea (181), Kunwha Parmaceuticals (119), Chosun Refractories (178), Dongwon Securities (80), Kookmin Bank (), Dongyang Trade (172)
2002	Regular Change	Hyundai Construction (38), Daewoo Construction (59),LG Card (196), Hyundai Department Store (47), LG Electronics (0),LG Chemicals (26), Daewoo Shipbuilding (29), Doosan Heavy Industry (34), LG Household & Health Care (55), Daewoo Machinery (72), Ssangyong Motors (), Daedeok GDS(83), Ssangyong Cement (98), Samyoung Electronics (100), Korea Electric Terminal (105), Aekyung Petro-Chemicals (115), Lotte Samgang (117), Gyemongsa (194), Dongyang Steel Pipe (192), AUK (146), Sungchang Industries (113), Car Pro (150), Hu-Steel (159),Samwha Electronics (175), AP Aero-Communication (166), Ilsung Pharmaceuticals (153),WISCOM(171), Dongshin Pharmaceuticals (144), Korea Cast Iron Pipe (167)
	Special Change	Samsung Air Control (154), Taepyungyang Industries (110), Sanwha Condenser (188), Woori Financial Holdings, Q & Tech Korea, Hana Bank

- Exclusion

Year	Type of Change	Name of Company
1995	Regular Change	Kumkang Industries (192), Kia Service (172), Dongyang Trade (176), Doosan Glass (193), Lotte Cookies (136), Lotte Chilsung (129), Midopa (150), Sammi (178), Ssangyong (149), Ssangyong Fine Engineering (195), Youngjin Pharmaceuticals (187), Youngpoong (119), Kolon Construction (142), Haitai Electronics (185), Heunga Tire (191)
	Special Change	Gumsung Communications, Gumsung Measurement, Gumsung Engineering

1996	Regular Change	Kia Fine Engineering (193), Daedong Industry (192), Daewon Spring(191),Tongkook Corporation (194), Dong Suh Industry.,INC (187),Byucksan (184),Samick (196),Seoul Securities (92), Sunkyung Securities (108), Aman Electronics (197),Iljin (189), Jeil Securities (121),Kolon Trade (143), Korea Development Leasing Corporation (81), Korea Cosmetics (195)
	Special Change	Woosung Construction, Samsung Construction, Dongshin Papers, Gunyoung, Inkel, Dongshin
1997	Regular Change	Gyungnam Energy (108), Kumgang (67), Core Teletech (185), Daewoo Electronic Parts (172), Dongsung Chemicals (188), Lotte Chilsung (106), Shinpung Papers (199), Youngchang Instruments (196), Woosungfeed (170), Yusung Corporation (197), Taechang (200), Hyundai Mipo Shipbuilding (166), Hyundai Woods (198), Hwasung Industries (149)
	Special Change	Hanbo Steel, Sammi Steel, Dongbu Chemicals, Hanshin Construction, Jinro, Daenong, Asia Automobile Industry, Gisan, Kia Steel, Kia Automobile, SBW, Haitai Electronics, Haitai Cookies, Taeil Fine Engineering, Miwon, Daesun Distilling, Mando Machine, Goryo Securities, Dongsuh Securities
1998	Regular Change	Dongbu Construction (184), Samsung Fire & Marine Insurance (19), Goryo Chemicals (73), Donga Tire Industries (90), Woongjin Publishing (119), Korea Polyol (157), Shinwon (196), Chosun Refractories (173), Hanil Synthetic Fiber (197), Korea Safe Glass (171), Choil Aluminum (170), Pulmuwon (174), Jinsung Remicon (191), Kumho Electrics (179), Maxxon Electronics (182), Kumho Chemicals (199), Ssangyong Heavy Industry (194), Geopyung Steel & Chemicals (181), Daeyoo Trade (198)
	Special Change	Chunggu, Nasan, Kukdong Construction, Donghae Pulp, Daehan Stones,Shinho Paper, Iljin Electrics Engineering, Gyunggi Bank, Dongwha Bank, NK Telecom, Dongshin Pharmaceuticals, Kukje, Ssangyong Papers, Tongil Heavy Industry, Korea Titanium
1999	Regular Change	Dongyang Fire & Marine Insurance (112), Korea Exp. (131), Ildong Pharmaceuticals (192), Daehan Fire & Marine Insurance (153), Gyungnam Corporation (115), LG Trade (103), Shinwon JMC (196), Poonglim Industries (139), Kolon Trade (156), Chungnam Textile (190), Hyundai Marine & Fire Insurance (75), Sambu Construction (150), Shinyoung Securities (70), SK Trade (98), Daeho (188), Hanjin (167), LG Fire & Marine Insurance (67), Doosan Construction (125), Kolon Construction (151), Dongyang Securities (79), Korea Reinsurance (116), Dongbang (194), Daewoo Auto Sales (84), Samchully (134), Hanchang (193), Daegu Bank (46), Busan Bank (87), Hanjin Construction (123), Gwangju Bank (74), Dongbu Fire & Marine Insurance (119), Shinwha Construction (149), Jeonbook Bank (135), Gyungnam Bank (117), Jindo (195), Taeyoung (77), Korea Computer (197), Kukdong City Gas (76), Fursys (144), Seoul City Gas (63), Korea Fine Chemical (85), Korea City Gas (50),KTB (120)

	Special Change	Hanwha Machinery, Korea Long-term Credit Bank, Hanil Bank, Boram Bank, Isu Chemicals, Goryo Petro-Chemicals, Kumho Construction, LG Steel, Sungwon Construction, Hyundai Auto Service, Daewoo Fine Industry, Korea First Bank, Seoul Bank, Hyundai Semiconductor, LG Merchant Bank, Daewoo Electronics, Daewoo Heavy Industry, Daewoo, Daewoo Communications, Ssangyong Mobile
2000	Regular Change	Samwhan Corporation (158), Hotel Silla (77), Hyundai Department Store (71), Daesung Industry (114), Willbes (124), Youngwon Trade (137), Samyang Trade (179), Daeshin Securities (52), Daegu Bank (59), Seoul Securities (91), Shinyoung Securities (97), Seohung Capsule (147), Samwha Paint Industry (161), Korea Shell Petroleum (182), Sempio Food Company (188), Banglim (191), Seongchang Corporation (190), Daewoo Electronics Parts (192), Seotong (193), Shindaeyang Papers (195), Rocket Electics (189), Sepoong (199)
	Special Change	Gangwon Industry, Goryo Chemicals, Korea Safe Glass, Daeyoung Packaging, LG Information Communcation, Donga Construction, Hanvit Bank
2001	Regular Change	Hansol CSN(96), Hyundai Trade (106), Dongwon Securities (82), KTB Networks (66), Asea Papers (192), Daedeok GDS(84), Saehan Media (196), Samyoung Electronics (74), Heunga Tire (194), Century (193), Saehan (197), Daeyang Steel (191), Seongan (195), Iljin Electrics (), AUK (119), Inzi Controls (185), WISCOM(143), Korea Godenshi (190), Dongwon Industry (135)
	Special Change	Kumho Chemical, Goryo Industrial Development, Daehan Aluminum, Orion Electrics, Shindongbang, Ssangyong Cement, Maxxon Telecom, Gohap, Hyundai Construction, Dongyang Chemicals, Huneed Technologies, Incheon Petroleum, Shinhan Bank, Heungchang, Samae Indus., Korea Data Systems, Korea Housing Bank, Kookmin Bank, Doosan Tech Pack
2002	Regular Change	Doosan Construction (82), Kolon Construction (103), Daeho (166), Dongwon Securities (0), Hyundai Merchant Ship (71), Green Cross (92), Dow Technology (93), Kukdong Cable (141), Jogwang Paint (162), Dongkuk Industry (175), Dongsung Chemical (174), Dongyang Trade (177), Seondo Electrics (180), Daechang Industry (182), Taepyungyang Pharmaceuticals (176), Cad Com (181), Hansung Corporation (184), Enex (186), Sewon E&T (185), Hankuk Textile (187), Taerim Packaging (178), Hansol Electronics (191), Samwha Condenser (188), Dongil Papers (183), Yuyang Information Communications (193), Joongang Papers (192), Radix (194), Daewon Chemical (195), KNC(196)
	Special Change	Medison, GPS, KEP Electronics, Q & Tech Korea, Kira Information Communcations, Hana Bank

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