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The effect of changes in index constitution: Evidence from the Korean stock market

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ABSTRACT

This paper examines the effect of changes in the KOSPI 200 index. We find evidence of permanent price effects and partial return reversal for the event stocks. Trading volumes tend to significantly increase during the event period and remain relatively higher than before the event. We also find some evidence of the existence of anticipatory trading effect before the effective dates and volatility effect. The results show that the abnormal return still exists even after adopting factor models and excluding newly added stocks. The indexing methodology of KOSPI 200 conveys the valuable information that the added stocks showed good performance and better earnings relative to the market average and the deleted stocks showed vice versa. In conclusion, member changes in the KOSPI 200 index are not information-free events.

1. Introduction

The addition or deletion of a stock from an index is important not only to index basket traders who must rebalance their portfolios, but also to arbitrageurs who exploit these opportunities to make a profit. The index change effect was first investigated by Shleifer (1986), Harris and Gurel (1986) and Jain (1987). The effect has been extensively documented in numerous other studies of abnormal stock price movement around the event period that cannot be explained by the efficient markets hypothesis. However, questions about what drives stock prices and what affects the behavior of individual stocks remain unanswered.

Most research on the index change effect has focused on the S&P 500. Starting in the mid-1990s, some studies began examining other indices (see, e.g., Beneish & Gardner, 1995; Chen, 2006) and in recent years researchers have started to study indices of developed markets outside the U.S. (see, e.g., Liu, 2000; Masse et al., 2000; Masse, 2007; Qiu & Pinfold, 2008). However, research on indices of emerging markets is still in its early stages (see, Bildik & Gulay, 2008; Elayan et al., 2000).

The index change effect is an important and critical issue in Korea since asset size in Korea Stock Exchange Price Index (KOSPI) 200 and the number of index funds are growing quickly (depicted in Fig. 1), and the Korean stock market is on the verge of transitioning from an emerging market to a developed market.[1] Moreover, the KOSPI 200 index itself is meaningful to researchers studying derivative markets since the futures and options contracts underlying KOSPI 200 are some of the most active in the world. The KOSPI 200 index effect is therefore deserving of attention from academics and practitioners.

This study investigates the index change effect of the KOSPI 200 index in terms of abnormal return, volume and risk. We first calculate abnormal return using a simple model and then compare the results to those obtained when using one-factor and three-factor models. We examine the abnormal volume effect using relative dollar volume ratio measure. In addition, we attempt to explain the change effect by analyzing the volatility and beta of event stocks. We also examine the index change effect by focusing on stocks newly added to the index while excluding the prior constituents. From our results, we conclude that changes in the KOSPI 200 index show the same abnormal return behavior as has been found in data for the U.S. and other developed markets.

Our study is important for several reasons. Firstly, the present study represents the first attempt at providing a comprehensive analysis of index change effects within the Korea Stock Market. Secondly, the results of this research offer a meaningful counterpoint to results obtained for developed countries, such as analyses involving the S&P 500 by comparing the indexing methodology. Thirdly, we try to explain the abnormal return of event stocks by volatility changes and information

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[1] FTSE has started to include the Korean stock market in developed market indices beginning in 2009. MSCI is also under reviewing this process.

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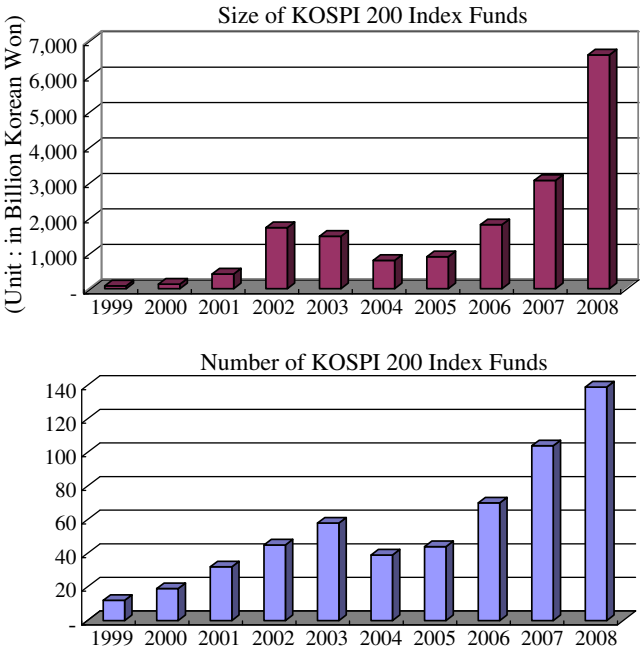

Fig. 1. KOSPI 200 index fund market trend.
Source: Zeroin Inc. (www.funddoctor.co.kr).

content hypothesis adoption. Lastly, we analyze the addition effect by restricting part of the analysis to focus solely on newly added stocks.

The study is organized as follows. In Section 2 we discuss the relevant existing literature and briefly describe the motivations behind our empirical predictions. Section 3 describes the data and methodology. We analyze the index change effect by abnormal return and volume in Section 4. In Section 5 we report results of additional tests and offer some discussion of our findings. Our conclusions are presented in Section 6.

2. Prior studies of the index change effect

Prior research on the index change effect can be categorized into two groups by the interested measures. The first group focuses on the return and volume, while the second group on risk measures such as beta and volatility.

The first group attempts to explain price and volume effects by suggesting the new explainable hypotheses. The main differences among these hypotheses involve whether the stock price or volume change is temporary or permanent, what kind of information is revealed with the addition or deletion of a stock, and what are the primary determinants of stock movement and investor's behavior.

The Price Pressure Hypothesis (PPH) argues that if a company is added to the index, the price will temporarily increase by the excess demand for funds following the announcement date, and revert to the original equilibrium price after the event window. The effect on trading volume should behave similarly to the price effect. Harris and Gurel (1986), Woolridge and Ghosh (1986) and Biktimirov, Cowan and Jordan (2004) support the PPH.

The Downward-Sloping Demand Curve for Stocks Hypothesis (DSH) contrasts with the PPH, predicting a permanent price effect due to the non-availability of equivalent stocks. While the PPH assumes a downward-sloping demand curve in the short-run, the DSH assumes a downward-sloping demand curve both in the short-run and in the long-run. DSH was firstly proposed by Shleifer (1986), and has been supported by Beneish and Whaley (1996), Lynch and Mendenhall (1997) and Wurgler and Zhuravskaya (2002).

Amihud and Mendelson (1986) posit that a firm added to the index becomes less expensive for investors to trade since increased liquidity decreases transaction costs and thus receives more interest from market analysts and investors. According to the Liquidity Cost Hypothesis (LCH), inclusion in the index is an event that promises a permanent increase in the stock's liquidity, and therefore both stock price and trading volume should see a permanent increase. Hedge and McDermott (2003) and Becker-Blease and Paul (2006) demonstrate support for LCH.

On the other hand, from the perspective of the Information Content Hypothesis (ICH), when a firm becomes a member of the index, this event conveys a meaningful piece of information such as improved or expected operating performance to the investors. Index change itself is not an information-free event. This information will have a permanent effect on prices and a temporary effect on volume. Analyses by Dhillon and Johnson (1991), Jain (1987), Denis et al. (2003), Cai (2007) and Platikanova (2008) are consistent with ICH.

According to the Investor Awareness Hypothesis (IAH), if one stock enters into the index, investor awareness of the stock will be higher than before and many investors will more seriously consider buying it. This affects the shadow cost[2] reduced, resulting in the increase in stock price. However, if a company drops out of the index, the awareness of that company will not diminished and shadow cost will not increase quickly. Chen et al. (2004) and Elliott et al. (2006) find support for IAH.

The above hypotheses have been quite controversial and each has been supported by evidence in studies that seek to explain abnormal returns and volumes following the addition or deletion of a stock from an index. Wide variance in findings across studies can be attributed to differences in markets, sample periods and event windows. Past studies mainly focus on the addition effects, and fully explore the deletions effects and differences between constituents that are newly added (new constituents) and constituents that are re-entering the index (previous constituents).[3]

Even though literature on the index change effect has been dominated by a focus on the return and volume, some studies investigated the risk measures and tried to explain index effects by them (see, e.g., Barberis et al., 2005; Mase, 2008; Vijh, 1994).

Vijh (1994) studies changes in the market betas of stocks added to the S&P 500 index, and finds that at both daily and weekly frequencies, stocks added to the index between 1975 and 1989 experience a significant increase in their betas after being added to the index. Barberis et al. (2005) also analyze the risk change caused by both the fundamental factor view and the non-fundamental factor view. The results of Vijh (1994) and Barberis et al. (2005) lead the authors to argue that stocks added to the S&P 500 experience an average increase in beta after inclusion during 1976–2000, and that this effect is not only present but is in fact also larger in more recent data in light of the growing importance of the S&P 500. They also find evidence of a decrease in beta for stocks deleted from the index. They argue that non-fundamental factors explain the effect better than fundamental factors.

3. Data and methodology

3.1. KOSPI 200 index

As the underlying index for Korean stock index futures and options, the KOSPI 200 consists of 200 constituents selected from all issues listed on the Korea stock exchange. The universe is the compositions of KOSPI index.[4] They are chosen based on factors such

[2] According to Merton (1987), investors can be divided into two groups: those who know one subset of stock, and those who do not. Generally, investors know of only a subset of all stocks (for example, KOSPI 200 member stocks), and hold only the stocks they are aware of and demand premium (shadow cost) for the non-systematic risk that they bear. The difference in the required rate of return between a completely diversified portfolio and an incompletely diversified portfolio is the shadow cost.

[3] Mase (2008) recently offered insights into the differing behavior of new constituents and previous constituents.

[4] During the sample period, the ratio of KOSPI 200 to KOSPI is about 80%.