

## **The Shrinking Index Effect A Global Perspective**

### Analytical Contacts

Aye M. Soe  
(212) 438 - 1677  
[aye\\_soe@sandp.com](mailto:aye_soe@sandp.com)

Srikant Dash, CFA, FRM  
(212) 438 - 3012  
[srikant\\_dash@sandp.com](mailto:srikant_dash@sandp.com)

### Media Contact

Dave Guarino  
(212) 438-1471  
[dave\\_guarino@sandp.com](mailto:dave_guarino@sandp.com)

- The index effect, or the excess returns of a stock added to a leading index, is one of the most researched pricing anomalies in finance.
- Is the index effect shrinking? To answer this question, we study the index effect for headline indices of five of the biggest equity markets in the world: U.S. (S&P 500), Canada (S&P/TSX 60), Japan (Nikkei 225), U.K. (FTSE 100) and the Germany (DAX 30).
- We find that excess returns for index additions have diminished over the past five years. The median excess return of S&P 500 additions was 3.8% for the past five years, compared to 6.0% for the five years prior. The declining pattern is also observed in Nikkei 225, S&P/TSX 60 and DAX 30, but not the FTSE 100.
- The diminishing index effects may be attributed to several factors:
  - First, the index effect has fallen victim to its own popularity. As more arbitrageurs have come in to the market, arbitrage profits have reduced.
  - Second, changes in market structure and trading patterns of index funds have dented the index effect.
- The index effect may never vanish completely. But its days as a profitable trading strategy may be numbered. Alternative index-related profit opportunities involve trading index changes in the options market or trading index share changes.

---

## Index Effect Redux

---

From tests of demand curves of stocks to more recent industry research on “wealth loss” associated with changes to popular stock indices, the price pop of a stock added to a headline index, or the “index effect,” has been a much-researched topic. The fact that stocks added to a popular index experience excess returns and volumes between the announcement date (AD) and effective date (ED), followed by a small post-ED correction has been well documented over the last two decades.

Our aim here is not to revisit the usual pattern of the post-addition price pop. Rather, we wish to highlight an inter-temporal shift in the index effect, which we believe has important ramifications. In 2004, we published research confirming anecdotal stories about the decline in the index effect for S&P 500 additions. This paper aims to extend the scope of that research by analyzing the index effect in a global context. We study the price effects of index additions for five of the most widely followed indices globally; S&P 500, DAX 30, FTSE 100, S&P/TSX 60 and Nikkei 225. These indices are the headline stock market indices for five of the biggest equity markets in the world, and have large amounts of indexed assets and active derivatives markets linked to them.

---

## A Very Brief Review of Literature

---

Much of the literature and theories surrounding index effects has been primarily focused on the S&P 500 deletions and additions, but the other indices we study have also been the subject of a fair amount of research. Most studies attribute the index effect to one of five competing hypothesis. According to the *price-pressure hypothesis*, prices will reverse after the index change when heavy index fund trading subsides around the change date. According to the *imperfect substitutes hypothesis*, the price effect is permanent because index fund buying changes the available float of shares. The *liquidity hypothesis* suggests that prices are affected if the liquidity of stocks being deleted is affected. According to the *information content hypothesis*, index addition and deletions have information on firm specific factors that will affect prices of the firm's stock. Also, additions and deletion from the index affect the level of scrutiny and analyst coverage of the stocks. According to the *selection criteria hypothesis*, evidence of abnormal returns is not robust since the stock selection process followed by index providers itself uses historical prices.

Recent industry research has begun to look at the diminution in the index effect. Dash and Blitzer (2004) studied the diminishing index effects of S&P 500 index additions and deletions. The study found that while the index effect is still present, there has been a decline due to changes in the trading environment and

the way index funds handle the index changes. Declining excess returns have led to the research on alternative ways to profit from index changes. Dash and Liu (2008) explored the replicable options-based trading strategies that seek to capture the index effects. Their study found that buying at-the-money calls for S&P 500 additions from outside the S&P 1500 on the day after the announcement and selling the position on the effective date yields returns of 32% on average. Similarly, the Credit Suisse Portfolio Strategy team (2008) finds that abnormal returns from trading index changes have been steadily declining in recent years and explore index related opportunities via trading share changes, as opposed to constituent changes.

## Index Changes Procedures

---

The indices we study have different index change procedures. Some follow a mechanistic and predictable index change policy, while others are less predictable. Some announce changes a few days before the effective date, while others announce changes several weeks before.

**S&P 500:** The S&P 500 is a market capitalization weighted index of the 500 leading U.S. companies. Constituents are reviewed as needed based on market capitalization, liquidity, public float, sector representation and profitability. Deletions occur due to bankruptcy, mergers, acquisitions, significant restructuring or significant violation of one of the eligibility measures. Due to the less mechanical nature of S&P index changes, changes are less predictable. Since 1989, S&P has a policy of announcing changes two to five days before the effective date.

**S&P/TSX 60:** The S&P/TSX 60 is a market capitalization weighted index of 60 of the largest and most liquid securities trading on the Toronto Stock Exchange. Since launch in 1998, it has evolved to be Canada's leading trading index and the index with the biggest amount in indexed assets. Like the S&P 500, index changes are not mechanical. Eligibility factors include market capitalization, liquidity, domicile and sector representation. Prior to September 2006, announcements for index changes are made one day prior to the close of the effective date. Since then, announcements are made three to five business days before the effective date.

**Nikkei 225:** The Nikkei 225 is a price-weighted index of 225 of the largest and most actively traded stocks on the first section of the Tokyo Stock Exchange. However, deletions can occur throughout the year. The criteria for inclusion are based on the liquidity and sector balance. While not completely transparent, the index changes are slightly more predictable than the S&P 500 and S&P/TSX 60. As such, we expect the index effect to be smaller. Constituents are reviewed annually with announcements made in September and changes effective at the beginning of October.

**FTSE 100:** The FTSE 100 is a market capitalization weighted index of 100 largest UK-domiciled companies listed on the London Stock Exchange. Index rules are straightforward. At each quarterly review, the FTSE Group ranks all LSE stocks by market capitalization in the descending order. Securities whose market cap are ranked 90<sup>th</sup> or above are included while securities whose market caps are lower than 110<sup>th</sup> are deleted. A 10 stock buffer is employed to reduce turnover. The clearly pre-defined rules for index composition allows for the market to assess additions precisely. As such, the index effect is expected to be less pronounced. Quarterly index reviews are conducted on the Wednesday after the first Friday in March, June, September and December. Changes become effective on the next trading day following the third Friday of the same month.

**DAX 30:** The DAX 30 is a market capitalization weighted index of 30 of the largest and most actively traded stocks listed on the Frankfurt Stock Exchange. The criteria for selection are based on exchange turnover and market capitalization. Annual reconstitution occurs based on fast entry, fast exit, regular entry and regular exit rules. In addition, the DAX is reviewed every three months on the basis of fast entry and fast exit rules. Fast entry occurs when a security outside of index is ranked 25 or better in both criteria. Fast exit occurs when a component security is deleted due to its ranking in exchange turnover or market capitalization lower than 45. Regular entry occurs when a security outside the index is included if it ranks 30<sup>th</sup> or better in both criteria. Like the FTSE 100, the clearly pre-defined rules for index composition allow for the market to assess additions precisely and the index effect is expected to be less pronounced.

Exhibit 1 highlights the differences in the review procedures of the five indices. Differences in the review frequency and the transparency of eligibility rules serve as important drivers of the index effect.

### Exhibit 1: Differences in the Review Procedures

	S&P 500	S&P/TSX 60	Nikkei 225	FTSE 100	DAX 30
Predictability of Additions	Low	Low	Medium	High	High
Periodicity of Review	As Needed	As Needed	As Needed + Annual	Annual with Quarterly Review	Annual with Quarterly Review
Frequency of Changes	High	Low	Medium	High	Low

Source: Standard & Poor's.

## Data and Methodology

---

To evaluate if any shift in index effect has occurred, we divide our sample into two periods. The first period is from September 1998 to August 2003. The second period is from September 2003 to August 2008. The total number of additions in our sample varies substantially among the indices. Our sample consists of 274 additions in the S&P 500, 36 in the S&P/TSX 60<sup>1</sup>, 13 in DAX 30, 77 in Nikkei 225 and 133 in FTSE 100. This sample is scrubbed to remove additions associated with corporate actions such as mergers, acquisitions or other corporate restructuring.

As is common in studies of the index effect, we do not use the absolute return of the stock, but its excess return. Excess return is the difference between the stock return and the return on the relevant market, as represented by the index. We also present medians rather than means because of the differences in sample sizes across different indices.

We use the following terminology in subsequent sections.

**AD:** Announcement Day. This is the day on which names of the stocks to be added are announced officially by the index provider.

**AD+1:** The day after the announcement day

**ED:** Effective Day. S&P 500 and S&P/TSX 60 index change announcements refer to the day on which a theoretical index tracker has to trade at close of market, while others use the term to refer to the next day open at which the new stock starts impacting index calculation. We use the S&P terminology for ED.

**ED+”X”:** “X” business day after the effective date, where X is 1 to 5.

## Results

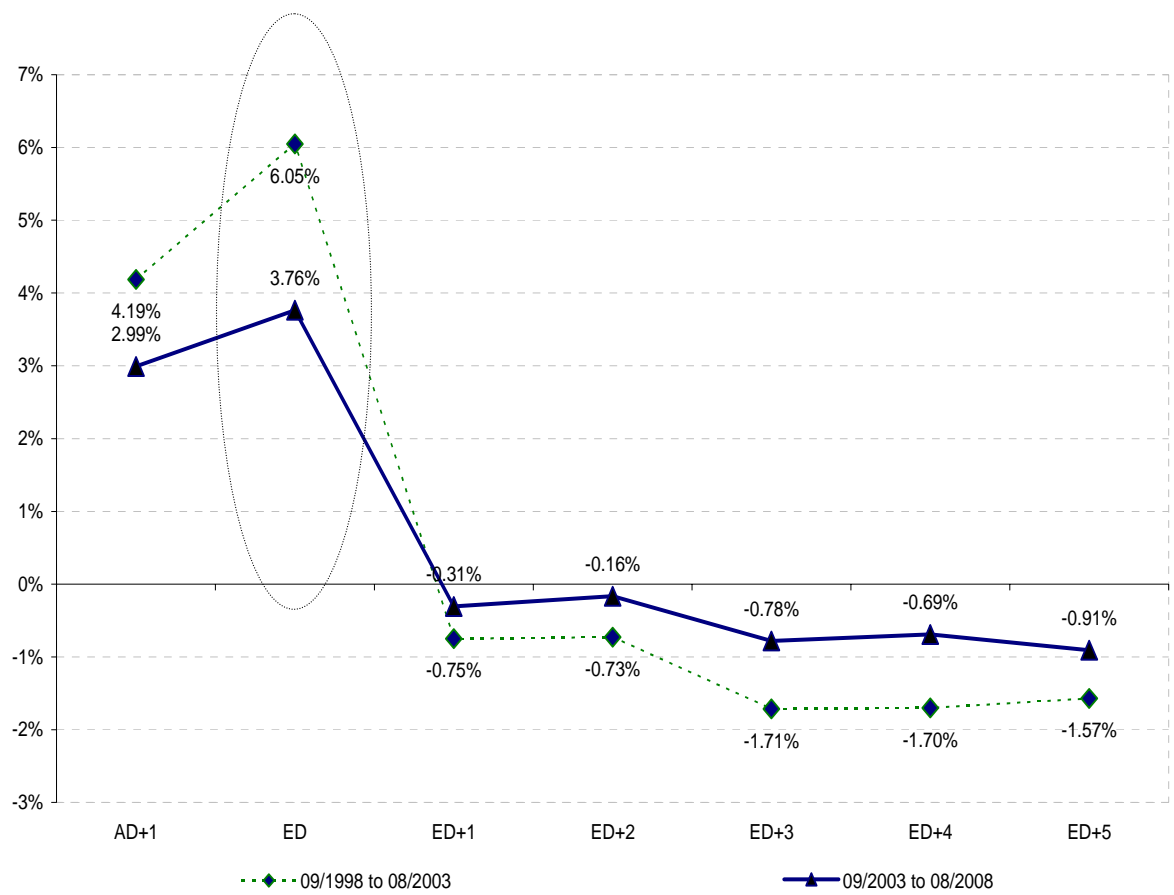
---

Exhibit 2, 3, 4, 5 and 6 show the median excess returns of additions to S&P 500, S&P/TSX 60, Nikkei 225, DAX 30 and FTSE 100 respectively over the two time periods.

---

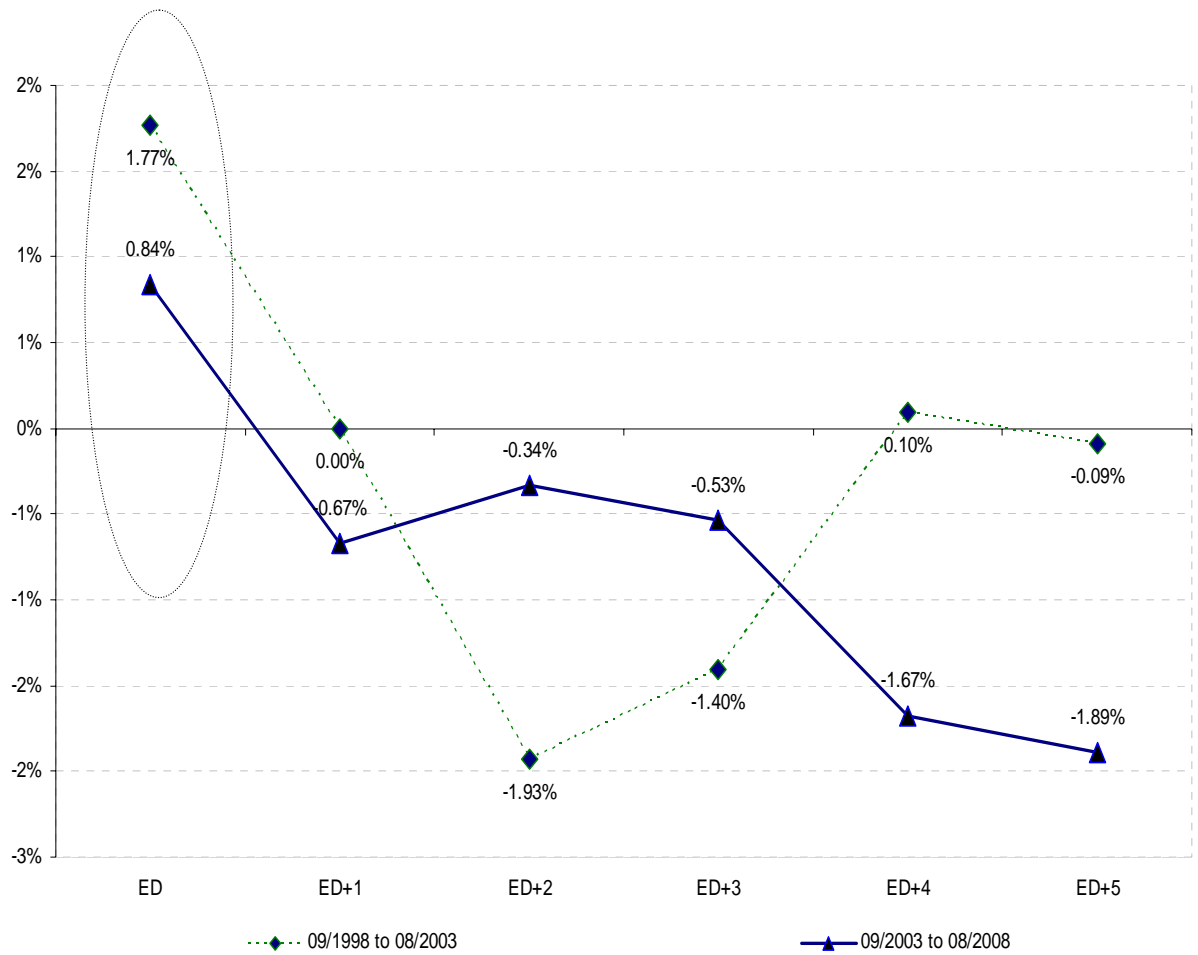
<sup>1</sup> The first time period in S&P/TSX 60 starts in January 1999 when the index was introduced, and not September 1998 as is the case for the other four indices.

**Exhibit 2: Median Excess Returns Following S&P 500 Addition Announcement**



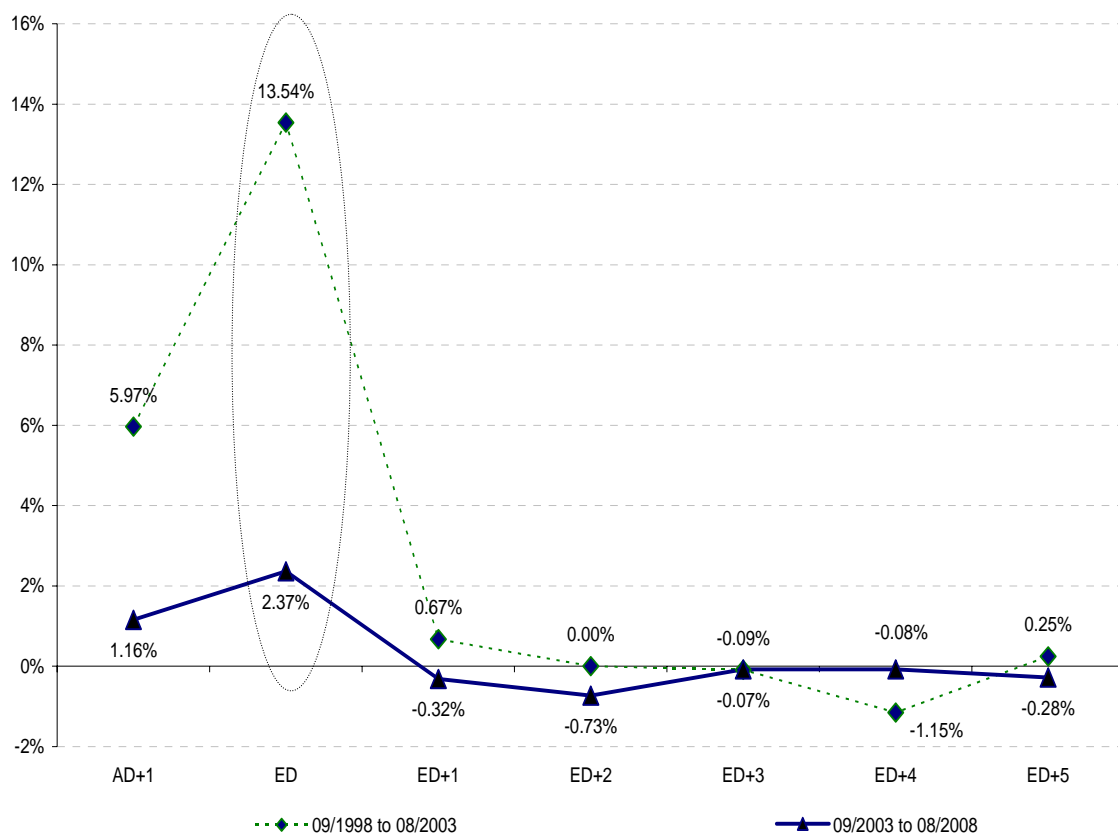
Source: Standard & Poor's. FactSet.

**Exhibit 3: Median Excess Returns Following S&P/TSX 60 Addition Announcements**



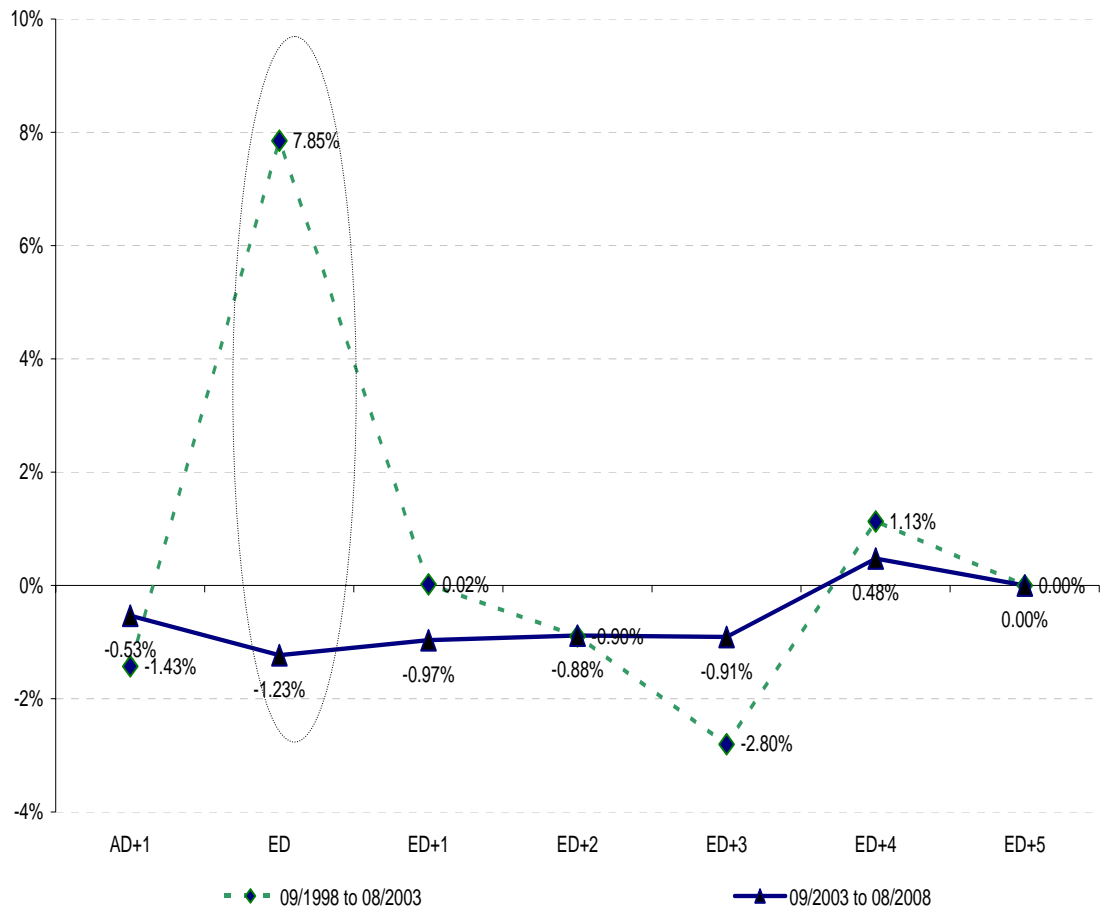
Source: Standard & Poor's. FactSet

**Exhibit 4: Median Excess Returns Following Nikkei 225 Addition Announcements**



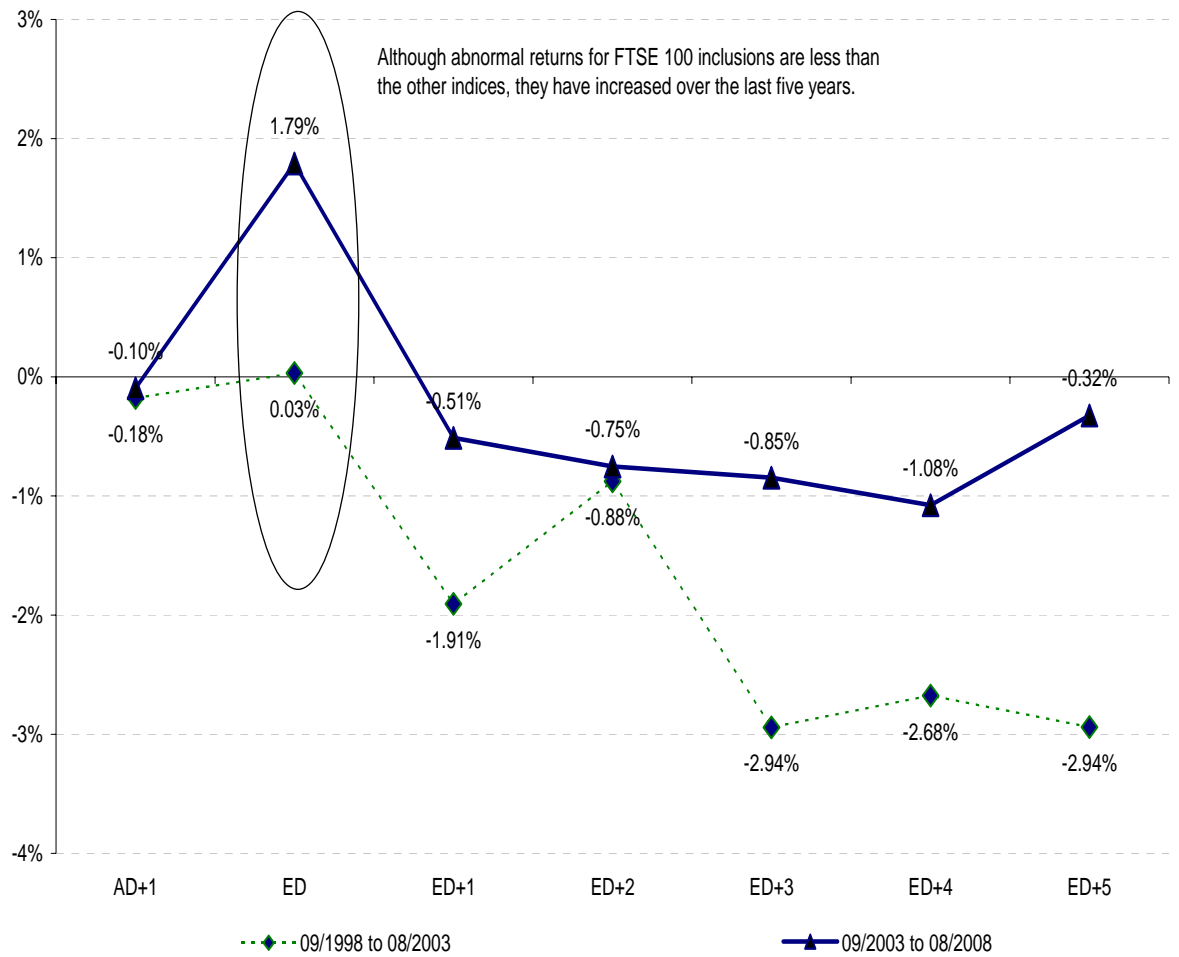
Source: Standard & Poor's. FactSet

**Exhibit 5: Median Excess Returns Following DAX 30 Addition Announcements**



Source: Standard & Poor's. FactSet

**Exhibit 6: Median Excess Returns Following FTSE 100 Addition Announcements**



Source: Standard & Poor's. FactSet

The exhibits show the bold line, representing the previous five years, below the dotted line, representing the five years before that, at the AD to ED horizon, for four out of five indices. This points to the diminution of the index effect for all the indices except the FTSE 100. It is also interesting to note that in both sample time periods, FTSE 100 and DAX 30 announcements result in no positive excess returns from AD to AD+1<sup>2</sup>. The results suggest that the announcements of additions to S&P 500 and Nikkei 225 were reacted to as new information while FTSE 100 and DAX 30 additions were previously anticipated. This is congruent to our assumption that mechanistic index changes are anticipated and reflected in prices prior to announcement<sup>3</sup>.

### Shrinking Index Effects?

S&P 500, S&P/TSX 60, Nikkei 225 and DAX 30 exhibit diminishing excess returns between the announcement date and effective date.

**Nikkei 225:** The most dramatic decline in excess returns is exhibited by the Nikkei 225. The median excess returns from AD to AD+1 fell from 5.97% to 1.16%. A bigger decline occurs in the excess returns from AD to ED, falling to 2.37% from 13.54%.

**S&P 500:** The median excess returns between AD & ED for S&P 500 additions declined from 6.05% from September 1998-August 2003 to 3.76% from September 2003-August 2008. Despite the decline, S&P 500 excess returns from AD to ED remain the highest among the group.

<sup>2</sup> In the case of S&P/TSX 60, the excess returns associated with AD to AD+1 is omitted as announcements prior to September 2006 are made one day prior to the effective date, making AD+1 and ED the same.

<sup>3</sup> In addition, the lack of AD to AD+1 price effects for the DAX 30 can also be explained by its stock concentration. Given the following equation,

$$\text{Excess Return} = R_j - \text{Index Returns} \quad (1)$$

$$\text{Excess Return} = R_j - \sum_{i=1}^n w_i * R_i \quad (2)$$

Where

$R_j$  = Return of Announced Stock

$w_i$  = weight of the  $i^{\text{th}}$  constituent

$R_i$  = return of  $i^{\text{th}}$

$n$  = the number of stocks in the index

Given the equation above, contribution from the  $i^{\text{th}}$  constituent to index return is a function of  $w_i$ . As such the smaller the  $n$ , the likelihood of  $w_i$  being large increases and the contribution to return of  $R_i$  to the overall index becomes large. Hence, the lower the number of stocks in a given index, the higher the stock effect from an addition is, and the lower the index effect.

**S&P/TSX 60:** The median excess return from AD to ED for S&P/TSX 60 additions declines from 1.77% in the earlier period to 0.84% in the latter period.

**DAX 30:** The DAX 30 index experienced the second highest decline in excess returns from 7.85% to -1.23%. However, the decline must be looked in the context of the smaller sample size.

**FTSE 100:** FTSE 100 is the only index where index effects have exhibited an increase, from 0.03% to 1.79%. However, the AD to ED returns are still lower than U.S. and Japan, which is to be expected given the predictability of the changes.

### What Explains the Decline?

The diminution of the index effect may be attributed to several factors:

- First, the index effect may have fallen victim to its own popularity. The index effect generates an arbitrage opportunity caused by sudden demand for shares of a particular stock. Over the past decade, hedge funds and proprietary trading desks have increased their market participation in index trades to exploit this opportunity. As with any arbitrage opportunity, increase in arbitrageur activity has diminished profits.
- Second, changes in market structure and trading patterns of index funds have dented the index effect. For example, in the U.S., decimalization of U.S. stock trades in 2001 and the institution of a closing cross at the Nasdaq in 2003 have had a meaningful impact on the post-addition price pop for S&P 500 changes. Similarly, the greater integration of trading venues and growth of non-exchange markets for block trades in Europe may have impacted the observed index effect for FTSE 100 and DAX 30. Anecdotal evidence suggests that index funds have also begun to trade differently over the past decade. Instead of simply trading at the close, many trade around the close to get the price. They may on occasion transfer the risk to trading desks that guarantee them the closing price (or a penny better). This creates an incentive for the trading desk to trade around the close to get a better price than the close.

### Whither Index Effect?

So what is the future of the index effect? Our study confirms that the index effect is still present and may never disappear. However, the magnitude of price changes that have been previously associated with index additions has begun to diminish, as evidenced by the level of excess returns in the past five years.

Efficient market hypothesis argues that markets follow a random walk. As such, the presence of index effects is simply another market anomaly that will be arbitrated away to a point where there may be a small observable price pop, but it may not be executable. Traders seeking to profit from index changes are better off seeking opportunities in lesser known areas such as trading index changes in the options market, or trading index share changes.

## References

---

1. Dash S. and D. Blitzer, “Index Effect Revisited: What Happened to the Post-Addition Price Pop?” Standard and Poor’s (2004).
2. Dash S. and B. Liu, “Capturing the Index Effect via Options” Standard & Poor’s (2008).
3. Desouza, G., “5 Ways to Trade S&P Index Changes” Credit Suisse Portfolio Strategy (2008)

## Disclaimers

---

This report is published by Standard & Poor's, 55 Water Street, New York, NY 10041. Copyright © 2008. Standard & Poor's (S&P) is a division of The McGraw-Hill Companies, Inc. All rights reserved. Standard & Poor's does not undertake to advise of changes in the information in this document.

These materials have been prepared solely for informational purposes based upon information generally available to the public from sources believed to be reliable. Standard & Poor's makes no representation with respect to the accuracy or completeness of these materials, whose content may change without notice. Standard & Poor's disclaims any and all liability relating to these materials, and makes no express or implied representations or warranties concerning the statements made in, or omissions from, these materials. No portion of this publication may be reproduced in any format or by any means including electronically or mechanically, by photocopying, recording or by any information storage or retrieval system, or by any other form or manner whatsoever, without the prior written consent of Standard & Poor's.

Standard & Poor's does not guarantee the accuracy and/or completeness of any Standard & Poor's Index, any data included therein, or any data from which it is based, and Standard & Poor's shall have no liability for any errors, omissions, or interruptions therein. Standard & Poor's makes no warranty, express or implied, as to results to be obtained from the use of the S&P Indices. Standard & Poor's makes no express or implied warranties, and expressly disclaims all warranties of merchantability or fitness for a particular purpose or use with respect to the S&P Indices or any data included therein. Without limiting any of the foregoing, in no event shall Standard & Poor's have any liability for any special, punitive, indirect, or consequential damages (including lost profits), even if notified of the possibility of such damages.

Standard & Poor's does not sponsor, endorse, sell, or promote any investment fund or other vehicle that is offered by third parties and that seeks to provide an investment return based on the returns of S&P Indices. A decision to invest in any such investment fund or other vehicle should not be made in reliance on any of the statements set forth in this document. Prospective investors are advised to make an investment in any such fund or vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or vehicle.

Analytic services and products provided by Standard & Poor's are the result of separate activities designed to preserve the independence and objectivity of each analytic process. Standard & Poor's has established policies and procedures to maintain the confidentiality of non-public information received during each analytic process.