

S&P 500 Index Additions and Earnings Expectations

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ABSTRACT

Stock price increases associated with addition to the S&P 500 Index have been interpreted as evidence that demand curves for stocks slope downward. A key premise underlying this interpretation is that Index inclusion provides no new information about companies' future prospects. We examine this premise by analyzing analysts' earnings per share (eps) forecasts around Index inclusion and by comparing postinclusion realized earnings to preinclusion forecasts. Relative to benchmark companies, companies newly added to the Index experience significant increases in eps forecasts and significant improvements in realized earnings. These results indicate that S&P Index inclusion is not an information-free event.

STUDIES THAT EXAMINE THE PRICES of common stocks when they become included in the Standard & Poor's (S&P) 500 Index have appeared regularly in leading finance journals since 1986. Fascination with the effect of S&P Index inclusion on stock prices appears to stem from the possibility that inclusion in the Index is an "information-free" event—information free in the sense that S&P makes no claim that inclusion represents an endorsement of the newly included stock's future prospects.¹ Indeed, S&P makes an affirmative claim to the contrary: "Company additions to and deletions from an S&P equity index do not in any way reflect an opinion on the investment merits of the company" (Standard and Poor's (2002b), p. 1). Thus, if Index inclusion is an information-free event, the well-documented positive stock price change associated with Index inclusion must be due to some factor (or factors) other than information about the future prospects of the newly included stock.

The leading candidates for such factors appear to be that demand curves for common stocks slope downward and/or that stock prices are subject to a short-term price pressure that temporarily raises a stock's price when the stock is added to the Index. All but one of the prior studies report that the price increase is perma-

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¹For example, according to Shleifer (1986, p. 587), "This paper examines stock inclusions into the S&P Index to examine the DS [downward sloping demand curve] hypothesis in a context where information effects probably play no role," and according to Harris and Gurel (1986, p. 817), "...since it is unlikely that the change [in the Index] announcements convey new information to the market...study of their effects on prices and volume may identify price pressures in the absence of new information."

ment, thus, ruling out, or at least weakening support for, the proposition that the price increase is due to temporary price pressure. The remaining explanation appears to be that demand curves for common stocks slope downward. Indeed, studies of S&P Index inclusions have often been interpreted as providing powerful evidence for the proposition that demand curves for stocks slope downward.

A key premise underlying this conclusion is that Index inclusion is an information-free event. The line of reasoning that supports that premise appears to run as follows: S&P disavows that Index inclusion implies any judgment about the future prospects of the company. Additionally, to the extent that S&P does conduct any investigation of the newly added company, that investigation relies only upon publicly available information. Thus, inclusion in the Index provides no new information about the future prospects of the newly included company.

Note that the connection between Index inclusion and information runs from information to inclusion. That is, the presumption is that information is relevant if it *causes* Index inclusion. Suppose, however, that the connection between cause and effect runs in the other direction. Suppose that Index inclusion leads to an improvement in future performance for the newly included firms. This could occur, for example, because Index inclusion leads to greater scrutiny (or monitoring) of management by investors, and management, in turn, responds with greater effort. Or, it could be that the cost in managerial reputation is greater for the manager of an S&P 500 firm when it flounders than would have been the case had the same firm not been an S&P 500 company. Again, the result might be greater effort on the part of management when a stock is added to the Index. In either case, the announcement that a company will be included in the Index conveys to investors the message that the future performance of the newly included firm will be better than heretofore had been expected, not because S&P is revealing any information about the firm, but because S&P inclusion causes an improvement in performance.

It is this possibility that gives rise to our analysis of companies added to the S&P 500 Index. In particular, we examine investors' earnings expectations for newly added firms prior to and following Index inclusion. We find that, relative to benchmark companies, additions of companies to the Index are accompanied by improvements in expectations about the future earnings of the newly added companies. Likewise, relative to benchmark companies, earnings improvements are realized by the newly added companies. These results are consistent with the hypothesis that S&P 500 Index inclusion leads to improved corporate performance.

In conducting our analysis, we use as a proxy for investors' earnings expectations the median of analysts' earnings per share forecasts taken from Institutional Brokers' Estimates System International, Inc. (I/B/E/S). Relative to comparable companies, these median forecasts show significant increases from before to after Index inclusion.

We also analyze actual realized earnings against comparable company benchmarks. Consistent with prior studies of analysts' forecasts, both newly included stocks and their benchmarks, on average, achieve actual earnings per share (eps) that are less than their median forecasts. However, the average difference between the forecast eps and the actual eps is significantly smaller (i.e., less negative) for

newly added stocks than for their benchmark companies. Thus, in comparison with their peers that are not newly added to the Index, newly added stocks demonstrate better than expected earnings per share. In sum, inclusion in the S&P 500 Index appears to be associated with an increase in investors' earnings expectations and with an improvement in actual earnings relative to comparable companies.

Our analysis does not prove that demand curves for stocks do not slope downward. Indeed, the apparent information effect associated with additions to the S&P Index does not preclude a contemporaneous demand curve effect. Studies based on events other than the S&P Index inclusion also investigate the question of whether demand curves for individual stocks slope downward and come to mixed conclusions. For example, Scholes (1972), who examines stock price reactions to large-block trades, and Mikkelsen and Partch (1985), who study price reactions to announcements of secondary equity offerings, conclude that their results are more consistent with an information effect than with a demand curve effect. Loderer, Cooney, and Van Drunen (1991), who study announcements of equity offerings by regulated firms, and Bagwell (1992), who studies Dutch auction share repurchases, conclude that their evidence is most consistent with a demand curve effect.

The strength of studies based on S&P Index additions is that announcements of such additions have been thought to be information free. It is for this reason that stock price increases associated with S&P 500 Index additions have often been interpreted as providing powerful evidence in support of the conjecture that demand curves slope downward. Our analysis questions the key premise underlying these tests. In particular, based on our results, Index inclusion does not appear to be an information-free event. Demand curves for stocks may slope downward, but tests of that hypothesis that are based on S&P 500 Index additions must control for the apparent information content embedded in announcements of such events before reaching that conclusion.

Section I reviews prior studies of S&P Index changes. Section II describes the sample and data. Section III reports the results of our event stock of stock prices. Section IV reports our analysis of analysts' earnings forecast. Section V reports our analysis of realized earnings. Section VI gives the results of various sensitivity analyses. Section VII concludes.

I. Prior Studies of S&P 500 Index Inclusions

Prior studies of the effect of inclusion in the S&P 500 Index on stock prices include Harris and Gurel (1986), Shleifer (1986), Jain (1987), Dhillon and Johnson (1991), Beneish and Whaley (1996), Lynch and Mendenhall (1997), and Wurgler and Zhuravskaya (2002). These studies encompass various time periods beginning in 1966 and continuing through 1995. Each study reports a positive average price change associated with inclusions of stocks in the Index. With the exception of Harris and Gurel, each of the studies concludes that (at least part of) the price increase associated with Index inclusion is permanent and, therefore, that the evidence supports the hypothesis that demand curves for stocks slope downward. Contrarily, Harris and Gurel conclude that the entire price increase is quickly reversed.

Most of the studies do not stop with an analysis of announcement period stock prices. Their authors recognize that Index inclusion may convey information about the quality of the newly added firms. To address this issue, the studies undertake additional analyses. Shleifer (1986) analyzes whether the stock's announcement period excess return is correlated with the firm's bond rating. The idea behind this test is that the "good news," if there is any, should be greater for lower-rated bonds than for higher-rated bonds. He finds no significant difference between the announcement period returns to newly added stocks of companies with high versus those with low bond ratings. He concludes that "this result sheds doubt on a plausible theory that S&P has special information about firms' longevities" (Shleifer (1986), p. 587).

Harris and Gurel (1986) determine that the initial announcement period price increase associated with Index inclusion is reversed over the subsequent 30 days. They conclude that such a price reversal is inconsistent with an information effect, which should be permanent. Thus, they also conclude that Index inclusion is free of information about the newly added firms' future performance.

Lynch and Mendenhall (1997) focus on the question of whether an investor could make excess returns from a trading strategy based on S&P announcements. As part of their analysis, they observe a mild decline in excess returns following Index inclusions and conclude that this pattern in returns is inconsistent with an information effect because an information effect should have a permanent (non-reversed) impact on stock prices. Beneish and Whaley (1996) also focus on the question of whether an investor could earn excess returns from a trading strategy based on S&P announcements. They conduct no tests to determine whether the price increase that they document is due to an information effect.

Wurgler and Zhuravskaya (2002) recognize that "perhaps S&P 500 addition really does reflect good news about the prospects of the company, despite S&P's claim to the contrary" (p. 2). They argue that such an effect is difficult to reconcile with the apparent growing value of index inclusion, but they conduct no tests to determine whether such an effect is at work.

Contrary to other studies, Dhillon and Johnson (1991) conclude that Index inclusion is an information (i.e., "good news") event. Like (most) other studies, they conclude that the price increase associated with Index inclusion is permanent. They also report, however, that the prices of nonconvertible bonds that have been issued by newly added firms also increase. They conclude that this provides indirect evidence of an information effect in S&P Index additions.

None of these studies examines earnings expectations or realized earnings around the time period in which stocks are added to the S&P 500 Index. That is the task we take up herein.

II. Sample and Data

We analyze firms that were added to the S&P 500 Index over the period 1987 through 1999. Over this interval, Standard & Poor's identifies 314 stocks as being added to the Index. Many of these additions result from a merger, spinoff, or name change of a company that was already included in the Index. For example,

in 1994, Litton Industries, Inc. was deleted from the Index after spinning off its oil field services company, Western Atlas, Inc. In turn, Western Atlas was added to the Index to replace Litton. We do not consider Western Atlas an addition to the Index. Likewise, 38 other companies that were added to the Index due to spinoffs from an already included parent are not included in the sample.

A further 35 companies are deleted from the sample because they resulted from mergers. For example, in 1994 Viacom, Inc. acquired Blockbuster Entertainment Corp. Prior to the merger, Blockbuster had been included in the Index but Viacom had not. After the merger, Blockbuster was dropped from the Index and Viacom was added. We do not consider Viacom to be an addition to the Index.

Finally, three additions are dropped because they resulted from a name change to an already included stock and one is deleted due to uncertainty about its name.

We are left with 236 additions to the S&P 500 Index that are eligible for further analysis.² For these companies, daily stock returns are taken from the Center for Research in Security Prices (CRSP) database. Analysts' earnings forecasts and actual realized earnings are taken from Institutional Brokers' Estimates System International, Inc. (I/B/E/S). Because data required for certain tests are not available for each company, the size of the sample varies across tests. For each test, we report the size of the sample employed and the reasons as to why companies are excluded.

III. Analysis of Stock Returns

We begin with an event study surrounding announcements of additions to the Index. We use the traditional market model procedure with a value-weighted market index and market model parameters estimated over the period beginning 31 trading days after and ending 211 days after the announcement date to calculate excess returns around the announcement dates. We calculate an average announcement period excess return over the two-day interval that begins with the day of the initial announcement and includes the following day. Seven stocks are deleted from this analysis because daily returns are not available on the announcement date.

The average announcement period excess stock return is 4.65 percent (p -value < 0.001). Because there has been some question as to whether this announcement period excess return is "permanent," we also calculate cumulative excess returns for these stocks over the 30 trading days following Index inclusion (again using the market model procedure). Over this period, the market model average cumulative excess return is an insignificant -0.4 percent (p -value = 0.64). The average announcement period stock price increase appears to be permanent. Thus, like (most) other studies that have analyzed S&P Index additions over prior time periods, we find that stocks added to the S&P 500 Index over the period 1987 through 1999 are associated with a significant positive permanent (at least for 30 trading days) increase in price.

² A list of these 236 firms is available from the authors by request.

IV. Analysts' Earnings Forecasts

We have conjectured that the price increase that is associated with Index inclusion may come about because the closer scrutiny given to S&P 500 stocks leads to improved future performance for these companies. If addition to the Index is associated with an improvement in corporate performance, this improvement should show up immediately as an increase in investors' expectations about the company's future performance. To evaluate this conjecture, we analyze changes in investors' expectations of future corporate earnings when stocks are added to the S&P 500 Index. We use analysts' eps forecasts taken from the I/B/E/S database as a proxy for investors' expectations of future earnings.

In evaluating I/B/E/S earnings forecasts and changes to them, we will be concerned with comparisons to an appropriate benchmark. The benchmark is especially important in this analysis because prior studies have demonstrated that analysts tend to "walk down" their forecasts as the end of the fiscal year approaches (see, e.g., Richardson, Teoh, and Wysocki (2001), Brown (2001), Diether, Malloy, and Scherbina (2002), and references included therein). Apparently, analysts report optimistic earnings forecasts toward the beginning of the fiscal year and systematically revise their estimates downward as the year progresses. Because we will be comparing forecasts from before to after the event of Index inclusion during the same fiscal year, our benchmark must take into account the downward drift through time in analysts' forecasts. In that light, in part, the question becomes: Are analysts less likely to revise downward their eps forecasts for companies added to the S&P 500 Index than for other companies?

A. Analysts' Forecasts Reported in I/B/E/S

I/B/E/S is a secondary source of corporate earnings forecasts. For the past three decades, I/B/E/S has gathered and reported earnings forecasts by security analysts from around the world. I/B/E/S gathers earnings per share forecasts from individual analysts on a monthly basis for over 15,000 companies worldwide. The I/B/E/S database contains eps forecasts for quarterly and annual fiscal periods. The forecasts of annual eps, which we use in our analysis, can include up to five fiscal periods. However, analysts rarely make forecasts for periods beyond the second fiscal year, and few even make two-year forecasts. In reporting the forecasts, I/B/E/S specifically identifies the fiscal year to which the forecast applies. We focus on current-year and one-year-ahead annual median eps forecasts.

One issue that we must resolve is when to consider a forecast to be a current-year forecast. For example, on November 11, 1998 S&P announced that DMG, Inc. was to be added to the Index. DMG, Inc. has a fiscal year-end of December 31. However, DMG may not announce its 1998 earnings until March of 1999. As a consequence, during January and February of 1999, analysts may still be making forecasts for the 1998 fiscal year. We could use these forecasts as current-year forecasts. However, it seems a bit peculiar to consider a forecast that occurs up to two months after the close of the fiscal year as being a forecast for that year. To resolve this dilemma, we require that an announcement of an Index inclusion

occurs at least three months prior to the end of the current fiscal year in order for the current year's forecast to be considered a current-year forecast.

If an Index inclusion announcement for a company occurs during the three months immediately prior to the end of its fiscal year, we treat forecasts for the following fiscal year as current-year forecasts. For example, if a company's fiscal year-end is December 31, 1998, and the Index inclusion announcement takes place before October 1998, the earnings forecast for fiscal year 1998 is treated as a current-year forecast and the earnings forecast for 1999 is treated as a one-year-ahead forecast. If, on the other hand, a company's fiscal year-end corresponds to December 31, 1998 and the Index inclusion announcement takes place on or after October 1, 1998, the earnings forecast for 1999 is treated as a current-year forecast and the earnings forecast for December 2000 is treated as a one-year-ahead forecast.³

To calculate the preannouncement median forecast for a given company, for each analyst, we use the preannouncement eps forecast made closest in time to the announcement month, providing that the forecast was made no earlier than four months prior to the announcement month. From these individual forecasts, the median is determined. The average number of analysts per company is 10.47 with a median of 10, a maximum of 38, and a minimum of 2.

In conducting our analysis, we are interested in the change in the median forecast from before to after the month in which the announcement of Index inclusion occurs. Because new analysts may distort the median forecast, we exclude new analysts. We consider a new analyst to be an analyst who initiated coverage of a stock following the announcement month, but who had made no eps forecast for a particular company during the 12 months prior to the announcement month. To calculate the postannouncement median forecast for a given company, for each "continuing" analyst, we use the first postannouncement eps forecast, providing that the forecast was made no later than four months following the announcement month. From these individual forecasts, the median postannouncement forecast is determined.

B. Analysis of Eps Forecasts

To determine whether analysts tend to increase their earnings forecasts for companies that have been newly added to the Index, we tabulate the number of increases, decreases, and "no-changes" in the current-year and one-year-ahead median forecasts.

We are especially interested in whether analysts tend to increase their forecasts for newly added companies relative to their forecasts for benchmark companies. For this analysis, we generate two benchmarks for the "normal" rates of increases, decreases, and no-changes in current-year and one-year-ahead forecasts. For each newly added stock, the first benchmark includes all companies

³ Some studies consider forecasts made during the current fiscal year to be "one-year-ahead" forecasts and forecasts made for the next fiscal year to be "two-year-ahead" forecasts. We require that the forecast be for at least 12 months ahead to be considered a one-year-ahead forecast. Some year-ahead forecasts are as much as 23 months ahead.

in the I/B/E/S database for which we can calculate a current and/or one-year-ahead median eps forecast for the same preannouncement time period and the same postannouncement time period as for the newly added stock. The second benchmark is composed of companies matched with the newly added companies on the basis of industry, market capitalization, and “liquidity.” Each company in the I/B/E/S database is first sorted into 1 of the 12 Fama–French industry portfolios. Each industry portfolio is divided into 3 portfolios on the basis of market capitalization, with one-third of the firms in each market-value portfolio. Finally, within each industry and market-value portfolio, firms are sorted into 3 liquidity portfolios, where liquidity is defined as the five-year average of annual trading volume divided by the number of shares outstanding. This sorting procedure results in 108 portfolios. Each newly added stock is matched with its appropriate industry, size, and liquidity portfolio. We match on these three characteristics because S&P considers “industry group classification,” “market value,” and “trading activity” when selecting companies to add to the Index (Standard and Poor’s (2002a)). We refer to the first benchmark set as “all other companies” and the second as the “industry, size, and liquidity (ISL) matched companies.”

Of the 236 Index additions, there are 13 for which I/B/E/S reports no earnings forecasts. For an additional 18 companies, at least one of the required current-year forecasts is not available—either the preaddition forecast or the postaddition forecast. Thus, the sample used for the current-year analysis includes 205 newly added stocks. The sample for the one-year-ahead analysis is further reduced to 139 companies because I/B/E/S does not report one-year-ahead forecasts for an additional 66 companies.

C. Analysts’ Forecasts: Frequency of Forecast Increases and Decreases

Figure 1 presents histograms of the proportion of current-year forecasts according to whether the post-Index inclusion forecast is an increase, a decrease, or is unchanged relative to the pre-Index inclusion forecast. So, for example, according to Figure 1A, 52 percent of the current-year forecasts are revised upward following Index inclusion and 42 percent are revised downward. Thus, following Index inclusion, earnings expectations are more likely to be revised upward than downward. These results are perhaps a bit surprising given prior studies that show that analysts tend to revise their forecasts downward as the fiscal year progresses. However, it could be that S&P just happens to add stocks during time periods when analysts tend to revise their forecasts upwards. Thus, whether these rates of increases and decreases are unusual depends upon the “normal” rates of increases and decreases to earnings forecasts during the relevant time period.

Figures 1B and 1C present histograms of changes in eps forecasts for our two benchmarks. Figure 1B is the histogram for all other companies with I/B/E/S eps forecasts for the same time interval as the newly added stocks. This set includes 778,328 observations. Figure 1C is the histogram for the ISL-matched sample with eps forecasts for the same time intervals as the newly added stocks. This set includes 2,951 observations.

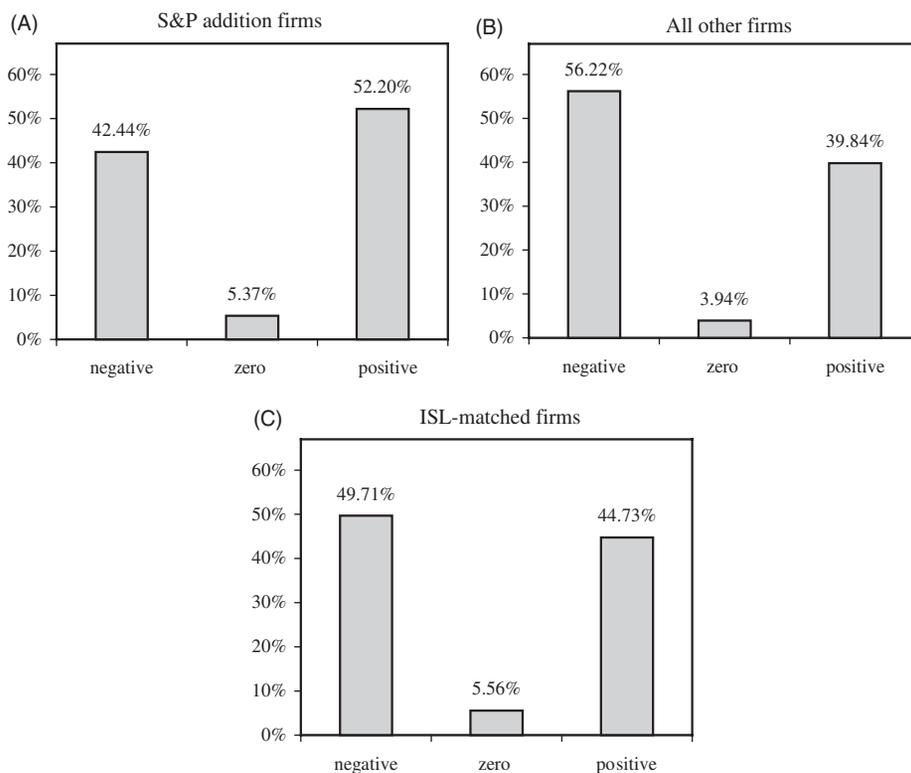


Figure 1. Frequencies of negative, zero, and positive changes in current-year eps forecasts for companies added to the S&P 500 Index and benchmark companies. Forecasts of eps are taken from Institutional Brokers' Estimates System International, Inc. (I/B/E/S) for a sample of 205 companies added to the S&P 500 Index over the period 1987 to 1999. Median eps forecasts preceding the month of announcement that a company will be added to the Index are compared with eps forecasts following the announcement month to calculate the change in eps forecasts. The changes in eps forecasts are calculated for current-year eps forecasts. The changes in eps forecasts are then grouped into negative, zero, or positive changes. The frequencies of negative, zero, or positive changes in eps forecasts for companies added to the S&P 500 Index are displayed in A. Changes in eps forecasts for all other firms reported in I/B/E/S with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as one benchmark ("All Other Firms"). The frequencies of negative, zero, or positive changes in eps forecasts for this benchmark are displayed in B. Changes in eps forecasts for firms in the same Fama-French 12 Industry portfolios and the same size and liquidity portfolios as the newly added firms and with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as a second benchmark ("ISL-Matched Firms"). The frequencies of negative, zero, or positive changes in eps forecasts for this benchmark are displayed in C.

In comparison with the two benchmarks, the newly added firms exhibit a significantly greater likelihood of having increases in current-year earnings forecasts and a significantly lower likelihood of having decreases in current-year earnings forecasts than do comparable companies that are not added to the Index. In particular, for all other companies, the rate of increases in forecast

eps is 40 percent and, for ISL-matched companies, the rate of increases is 45 percent. These compare with 52 percent for the newly included companies. Similarly, the rates of decreases are 56 percent for all other companies and 50 percent for the ISL-matched companies. These compare with 42 percent for the newly added stocks. To determine whether the fraction of increased (decreased) earnings estimates for the newly added companies is significantly greater (less) than those of the benchmark samples, we conduct binomial sign tests. In each case, the p -value is less than 0.01. Increases in eps forecasts are significantly more likely and decreases are significantly less likely than for either set of benchmark companies.

Figure 2 presents comparable histograms of the one-year-ahead forecasts for the newly added companies and their two benchmarks. The results here are similar to those in Figure 1. In particular, 51 percent of newly added firms experience an increase in their one-year-ahead forecasts, as compared to 42 percent for all other firms during the same time period and 47 percent for ISL-matched firms. Likewise, 39 percent of the newly added companies experience decreases in their one-year-ahead forecasts, versus 54 percent for all other stocks and 48 percent for ISL-matched stocks. In each case, the p -value is less than 0.01.

If we accept the proposition that median I/B/E/S forecasts are a reasonable proxy for investors' expectations, our results indicate that inclusion in the S&P 500 Index is associated with an increase in investors' expectations about the future earnings of the newly added firms. This result is true both in absolute terms (i.e., increases in eps forecasts exceed decreases) and, more importantly, in relative terms (i.e., newly added stocks have a significantly higher likelihood of an increase and a significantly lower likelihood of a decrease in their forecast eps than do their peers). Thus, on this basis, S&P 500 Index inclusion does not appear to be an information-free event.

D. Analysts' Forecasts: Magnitude of Forecast Changes

The analysis above demonstrates that increases in earnings forecasts are more likely and decreases are less likely for firms newly added to the S&P 500 Index than for comparable companies not newly added to the Index. A related question concerns the size of the changes in forecasts. We address that question in terms of both raw and standardized changes in eps forecasts, and we compare these changes for newly included companies to changes in forecasts for our same two groups of benchmark companies using both current-year and one-year-ahead forecasts.

We calculate raw changes in forecasts by subtracting the preannouncement eps forecast from the postannouncement forecast as

$$\Delta FE_i = FE_{i,+} - FE_{i,-}, \quad (1)$$

where ΔFE_i is the change in the eps forecast for company i , $FE_{i,-}$ is the pre-Index-inclusion eps forecast for company i , and $FE_{i,+}$ is the post-Index-inclusion eps forecast for company i .

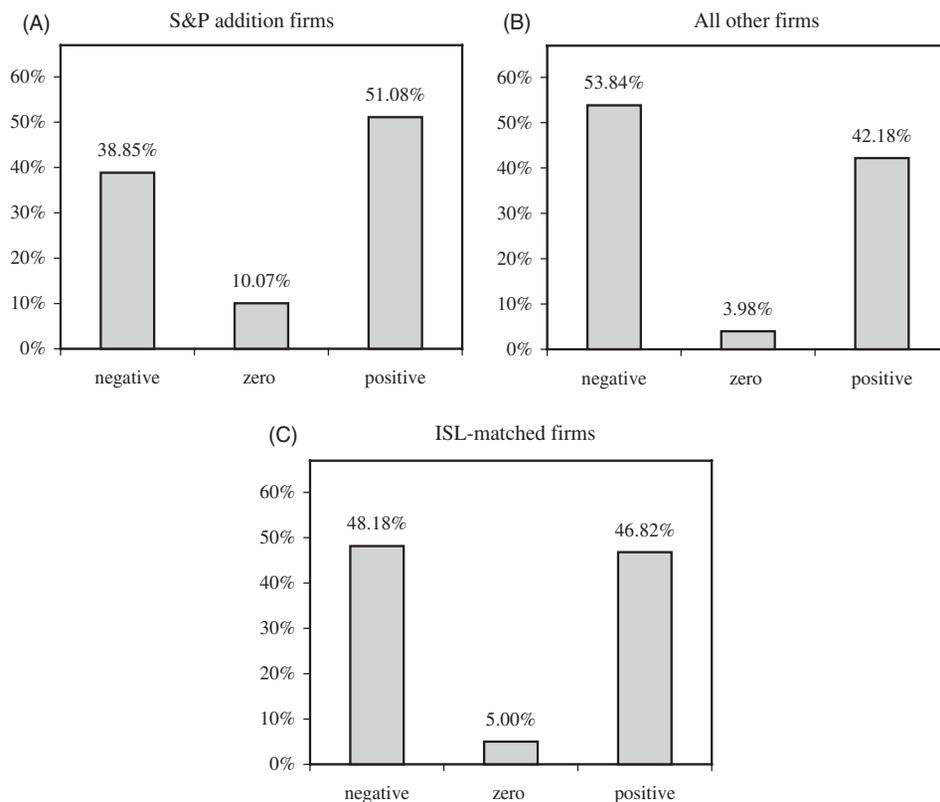


Figure 2. Frequencies of negative, zero, or positive changes in one-year-ahead eps forecasts for companies added to the S&P 500 Index and benchmark companies. Forecasts of eps are taken from Institutional Brokers' Estimates System International, Inc. (I/B/E/S) for a sample of 139 companies added to the S&P 500 Index over the period 1987 to 1999. Median eps forecasts preceding the month of announcement that a company will be added to the Index are compared with eps forecasts following the announcement month to calculate the change in eps forecasts. The changes in eps forecasts are calculated for one-year-ahead eps forecasts. The changes in eps forecasts are then grouped into negative, zero, or positive changes. The frequencies of negative, zero, or positive changes in eps forecasts for companies added to the S&P 500 Index are displayed in A. Changes in eps forecasts for all other firms reported in I/B/E/S with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as one benchmark ("All Other Firms"). The frequencies of negative, zero, or positive changes in eps forecasts for this benchmark are displayed in B. Changes in eps forecasts for firms in the same Fama-French 12 Industry portfolios and the same size and liquidity portfolios as the newly added firms and with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as a second benchmark ("ISL-Matched Firms"). The frequencies of negative, zero, or positive changes in eps forecasts for this benchmark are displayed in C.

Even though increases in median forecasts exceed decreases, as shown in the first row of Panel A in Table I, the mean (of the median) change(s) in current-year eps forecasts for the newly included firms is mildly and insignificantly negative at \$ - 0.0066 (p -value = 0.623). Panel A also shows mean forecast revisions for our

Table I
Changes in Analysts' Eps Forecasts for Companies Added to the S&P 500 Index

Forecasts of eps are taken from Institutional Brokers' Estimates System International, Inc. (I/B/E/S) for a sample of 205 companies added to the S&P 500 Index over the period 1987 to 1999. Median eps forecasts preceding the month of announcement that a company will be added to the Index are compared with eps forecasts following the announcement month to calculate the change in eps forecasts. The change in eps forecast is calculated for current-year eps forecasts and for one-year-ahead eps forecasts. Changes in eps forecasts for all other firms reported in I/B/E/S with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as one benchmark ("All Other Firms"). Changes in eps forecasts for firms in the same Fama-French 12 Industry portfolios and the same size and liquidity portfolios as the newly added firms and with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as a second benchmark ("ISL-Matched Firms"). The "Mean Difference" is the average of the differences between the newly added stocks' change in eps forecast and the mean of their respective benchmark sample changes in eps forecasts. The *p*-values in parentheses test whether the numbers above are significantly different from zero.

Sample	Comparison with All Other Firms			Comparison with ISL-Matched Firms		
	1	2	3	4	5	6
Sample Size	Mean Δ eps Forecast for S&P Index Addition Firms	Mean Δ eps Forecast for All Other Firms	Mean Δ eps Forecast for ISL-Matched Firms	Mean Difference (col. 2 - col. 3)	Mean Δ Eps Forecast for ISL-Matched Firms	Mean Difference (col. 2 - col. 5)
Panel A: Changes in Current-Year Eps Forecasts						
Eps forecast change	205	\$ - 0.0066 (0.623)	\$ - 0.0717 (< 0.001)	\$0.0651 (< 0.001)	\$ - 0.0278 (< 0.001)	\$0.0212 (0.099)
Eps forecast change standardized by price	205	- 0.07% (0.041)	- 0.71% (< 0.001)	0.64% (< 0.001)	- 0.18% (< 0.001)	0.11% (0.041)
Eps forecast change standardized by eps	203	0.58% (0.445)	- 5.94% (< 0.001)	6.52% (< 0.001)	- 0.98% (< 0.001)	1.55% (0.011)
Panel B: Changes in One-Year-Ahead Eps Forecasts						
Eps forecast change	139	\$ - 0.0069 (0.569)	\$ - 0.0634 (< 0.001)	\$0.0565 (0.001)	\$ - 0.0591 (< 0.001)	\$0.0522 (0.047)
Eps forecast change standardized by price	139	- 0.07% (0.101)	- 0.56% (< 0.001)	0.49% (0.001)	- 0.19% (< 0.001)	0.12% (0.010)
Eps forecast change standardized by eps	139	1.77% (0.040)	- 3.82% (< 0.001)	5.59% (0.001)	- 0.73% (< 0.001)	2.49% (0.004)

two benchmarks groups—all other firms and ISL-matched firms. For each of these sets, the mean forecast revision is significantly negative. For all other firms, it is \$ -0.0717 (p -value < 0.001), and for ISL-matched firms, it is \$ -0.0278 (p -value < 0.001). These results are consistent with prior studies of analysts' earnings forecasts, in which analysts systematically revise their forecasts downward as the fiscal year progresses.

To determine whether the changes in forecasts for newly added companies differ significantly from those of their benchmarks, we subtract the mean change in the eps forecast for each newly added firm's benchmark from the change in the newly added firm's eps forecast. We then calculate the average of these differences. The averages of the differences are also given in Panel A. In comparison with all other firms, the mean difference is \$0.0651 for changes in the current-year forecasts. In comparison with ISL-matched firms, the mean difference is \$0.0212. The p -values for the differences are less than 0.001 and 0.099, respectively.

The first row of Panel B presents changes in one-year-ahead eps forecasts. The results here are similar to those for current-year forecasts except that, in comparison with ISL-matched firms, the difference is larger in absolute value and statistical significance. For example, in comparison with all other firms, the mean difference is \$0.0565 (p -value = 0.001). In comparison with the ISL-matched firms, it is \$0.0522 (p -value = 0.047). If we assume that, in the absence of addition to the Index, analysts would have revised their eps forecasts for the newly added S&P 500 Index stocks similarly to those for other companies, the mean raw eps forecast revision for newly added stocks is about five cents per share.

Of course, a \$0.05 per share change in earnings forecast may have different implications for a stock with a \$2.00 price per share than for a stock with a \$20.00 price per share. Similarly, a \$0.05 per share change in eps forecast may have different implications for a company with earnings per share of \$0.50 than for a company with earnings per share of \$5.00. Therefore, we standardize the changes in eps forecast by share price and by earnings per share.

To standardize by share price, we divide the change in the eps forecast by the company's stock price as of the end of the month prior to the announcement month as

$$\Delta PFE_i = \frac{FE_{i,+} - FE_{i,-}}{P_{i,-}}, \quad (2)$$

where ΔPFE_i is the change in the eps forecast for company i standardized by share price, $FE_{i,+}$ and $FE_{i,-}$ are as defined above, and $P_{i,-}$ is company i stock price as of the end of the month prior to the announcement month.

To standardize by earnings per share, for those companies that have a positive preannouncement median eps forecast, we divide the change in the forecast by the preannouncement eps forecast as

$$\Delta EFE_i = \frac{FE_{i,+} - FE_{i,-}}{FE_{i,-}}, \quad (3)$$

where ΔEFE_i is the change in the eps forecast for company i standardized by share price and $FE_{i,+}$ and $FE_{i,-}$ are as defined above. Of the 205 companies with

current-year forecasts, 203 have a positive eps forecast. Of the 139 companies with one-year-ahead forecasts, all have positive forecasts.

For comparison, we calculate the same standardized changes in eps forecasts for our benchmark companies. We then subtract the mean of the standardized changes in eps forecast for the benchmark companies from the change in the standardized forecast for their respective newly added stocks. The averages of these standardized differences are presented in the second and third rows of Panels A (current-year forecasts) and B (one-year-ahead forecasts) of Table I.

For current-year forecasts, in comparison with their benchmarks, stocks that are newly added to the S&P Index experience a significantly positive increase in eps standardized by price and a significantly positive increase in eps standardized by pre-Index-inclusion earnings per share. For example, when the change in eps is standardized by pre-inclusion price, the newly added stocks experience an average positive change in their current-year eps forecast that is 0.11 percent greater than that of their ISL-matched companies. The p -value for this difference is 0.041. Similarly, when their eps forecasts are standardized by pre-Index inclusion eps, the newly added stocks experience a change in eps forecast that is 1.55 percent greater than the change in earnings forecast for their ISL-matched peers. The p -value for this difference is 0.011.

The results for the one-year-ahead forecasts are roughly parallel to those for the current-year forecasts, but with larger magnitudes for all measures. Additionally, the difference between the standardized changes in eps forecasts for the newly included stocks and their benchmarks have p -values that range from 0.004 to 0.041 and are, thus, statistically significantly different from zero by traditional standards.

V. Realized Earnings

Standard valuation models postulate that it is investors' expectations and changes in those expectations that are relevant to the determination of market prices. Thus, we have focused our analysis on proxies for investors' expectations and changes in those proxies. However, if investors are rational, expectations should be consistent with subsequent events, on average. For that reason, we also analyze actual realized earnings following additions to the S&P 500 Index.

A. Data and Methodology

To conduct this analysis, we use realized eps as reported in I/B/E/S for the fiscal period for which we also have a preannouncement eps forecast. The question we are addressing is whether companies that are newly added to the Index achieve earnings that are greater than the earnings that would have been expected prior to Index inclusion. Again, in conducting this analysis, we use analysts' median forecasts as a proxy for investors' expectations. Again, because of the documented tendency of analysts to report optimistic forecasts relative to actual earnings, comparison with appropriate benchmarks is important. The procedure that we employ determines the difference between the analysts' med-

ian eps forecast and the realized eps for the same fiscal period. For simplicity, we label these differences “forecast errors.”

We also calculate forecast errors for each of the benchmark companies and calculate the average of their forecast errors for each sample of benchmark companies. Then, for each newly added stock, we subtract the average forecast error for its benchmark companies from the forecast error for the newly added stock. We again use as benchmarks all other companies with contemporaneous forecasts and the ISL-matched companies with contemporaneous forecasts. We compare current-year median forecasts to current-year realized earnings and one-year-ahead forecasts to one-year-ahead realized earnings. We evaluate both raw and standardized eps forecast errors.

B. Results

The results of our analysis of realized earnings are presented in Panels A and B of Table II. The setup of this table is identical to that of Table I. Panel A gives results for current-year forecast errors. Panel B gives results for one-year-ahead forecast errors. Because the distribution of forecast errors is skewed, we calculate *p*-values for the differences between the forecast errors of the newly added companies and their benchmark samples using a bootstrap procedure.

For the companies newly included in the S&P Index, the mean forecast errors for both current-year and one-year-ahead forecasts are negative. They are \$ - 0.1441 and \$ - 0.3554, respectively. The average standardized forecast errors are also negative. Again, these results are consistent with prior studies showing that analysts tend to make optimistic forecasts early in the fiscal year and to revise their forecasts downward through time.

The key question is whether the forecast errors for the newly added stocks are “smaller” (i.e., less negative) than those of their peer groups. For current-year forecasts, the answer is yes. For example, the mean forecast error for all other firms is \$ - 0.2951, which is more than double the mean forecast error for the newly added firms (*p*-value for the difference = 0.003). The mean forecast error for the ISL-matched companies is \$ - 0.2433, which is almost double the mean forecast error for the newly added stocks (*p*-value for the difference = 0.053). For all of the standardized differences in current-year forecast errors, the *p*-values are 0.001 or less.

For one-year-ahead forecast errors and for standardized one-year-ahead forecast errors, the differences between the newly added stocks and their benchmarks are always positive. That is, the forecast errors for the newly added stocks are smaller (i.e., less negative) than are the forecast errors for the benchmark companies. Additionally, the mean differences in standardized forecast errors are all significantly different from zero with *p*-values of 0.03 or less. (However, the mean differences in raw forecast errors for one-year-ahead forecasts are not statistically different from zero.) Apparently, companies that are added to the S&P 500 Index experience better operating performance (as measured by realized eps) relative to expectations than do their peers who are

Table II
EPS Forecast Errors for Companies Added to the S&P 500 Index

Forecasts of eps and actual eps are taken from Institutional Brokers' Estimates System International, Inc. (I/B/E/S) for a sample of 199 companies added to the S&P 500 Index over the period 1987 to 1999. Median eps forecasts preceding the month of announcement that a company will be added to the Index are compared with actual eps to calculate the eps forecast error. The eps forecast error is calculated for current-year eps forecasts and for one-year-ahead eps forecasts. The eps forecast errors for all other firms reported in I/B/E/S with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as one benchmark ("All Other Firms"). The eps forecast errors for firms in the same Fama-French 12 Industry portfolios and the same size and liquidity portfolios as the newly added firms and with eps forecasts that are contemporaneous with the eps forecasts of the newly added stocks are used as a second benchmark ("ISL-Matched Firms"). The "Mean Difference" is the average of the differences between the newly added stocks' eps forecast error and the mean of their respective benchmark sample eps forecast errors. The *p*-values in parentheses test whether the mean differences in forecast errors are significantly different from zero. The *p*-values are computed using a bootstrapping procedure.

Sample	Comparison with All Other Firms			Comparison with ISL-Matched Firms		
	1	2	3	4	5	6
	Sample Size	Mean Forecast Error for S&P Index Addition Firms	Mean Forecast Error for All Other Firms	Mean Difference (col. 2 - col. 3)	Mean Forecast Error for ISL-Matched Firms	Mean Difference (col. 2 - col. 5)
Panel A: Current-Year Eps Forecast Errors						
Eps forecast error	199	\$ - 0.1441	\$ - 0.2951	\$0.1510 (0.008)	\$ - 0.2483	\$0.0992 (0.053)
Eps forecast error standardized by price	199	- 0.52%	- 2.82%	2.30% (< 0.001)	- 2.01%	1.48% (0.001)
Eps forecast error standardized by eps	199	- 4.85%	- 25.79%	20.94% (< 0.001)	- 18.49%	13.64% (< 0.001)
Panel B: One-Year-Ahead EPS Forecast Errors						
Eps forecast error	132	\$ - 0.3554	\$ - 0.4639	\$0.1085 (0.107)	\$ - 0.3799	\$0.0245 (0.518)
Eps forecast error standardized by price	132	- 1.13%	- 3.35%	2.22% (0.002)	- 2.16%	1.03% (0.002)
Eps forecast error standardized by eps	132	- 11.58%	- 32.41%	20.83% (0.007)	- 21.45%	9.87% (0.029)

not newly added to the Index. This result is consistent with the conjecture that addition to the Index improves performance.

VI. Sensitivity Analyses

In conducting our analyses, it was necessary to make various decisions along the way about the research procedure to employ. These decisions involved such matters as whether to analyze means or medians, which time intervals to include in calculating various statistics, whether to include forecasts by new analysts, and so forth. In this section, we describe tests that are based on other decisions about our research procedures. It turns out that the results are not sensitive to these variations in our research procedures.⁴

A. Event Study

Although the existence and magnitude of the positive average announcement period excess return associated with additions to the S&P 5000 Index does not appear to be in dispute, we did also conduct the event-study analysis using the market-adjusted return methodology (Masulis (1980)) and the size-and-book-to-market matching portfolio procedure. We also measured excess returns over various announcement period intervals.

B. Mean Analysts' Forecasts

In conducting our analysis of analysts' forecasts, we use the median forecast for each stock. We replicated our analysis using mean analysts' forecasts.

C. Timing Convention for Defining Current-Year and One-Year-Ahead Eps Forecasts

In Section IV, we describe our rule for classifying an eps forecast as being either a current-year or one-year-ahead forecast. Our rule is that the announcement of an Index inclusion must take place no later than three months before the end of the company's fiscal year in order for the forecast for that year to be considered a current-year forecast. This rule is clearly only one of several that could be used. As an alternative, we replicated our analyses with the rule that the announcement must occur no later than six months prior to the end of the company's current fiscal year in order for that fiscal year's forecast to be considered a current-year forecast.

A third alternative is to consider any forecast of the company's eps for the year of the Index inclusion to be a current-year forecast regardless of when the forecast was made (including forecasts that actually occurred after the end of that fiscal year). We also replicated our analyses using this rule.

⁴The results of these various tests are available in tabular form on the corresponding author's Web site: www.mgmt.purdue.edu/faculty/mcconnell/

D. All Analysts

In conducting our analysis, we excluded forecasts made by “new” analysts. We also replicate our analysis including forecasts from new analysts.

E. SIC-and-Size-Matched Benchmark Companies

In selecting our benchmark companies, we matched each newly added company to a portfolio of companies in the same Fama–French industry, size, and liquidity portfolio. We also replicated our analysis matching each newly added company on SIC codes and size. To match on SIC codes and size, we first selected all companies in the same two-digit SIC code as each newly added company. We then sorted all companies with the same two-digit SIC code into three market capitalization portfolios with one-third of companies in each portfolio. Finally, we matched each newly added stock with its respective SIC-and-size matched portfolio.

F. I/B/E/S Medians

We have calculated our mean and median eps forecasts using individual analysts’ forecasts from the I/B/E/S detail file. In a summary file, I/B/E/S gives its own “consensus” median and mean eps forecasts. We replicated our analysis using the I/B/E/S median and mean consensus forecasts.

G. Companies with Both Current-Year and One-Year-Ahead Forecasts

Our analysis of one-year-ahead eps forecasts includes 139 companies that are a subset of the 205 companies included in our analysis of current-year eps forecasts. We replicated our analysis of current-year forecasts using only the 139 companies for which we have one-year-ahead forecasts.

As we noted at the outset, our conclusions are not altered by any of the variations in research methodology summarized in this section.

VII. Commentary and Conclusions

We have motivated our analysis of earnings forecasts and realized earnings for companies newly added to the S&P 500 Index by conjecturing that Index inclusion might lead to better operating performance by newly included firms, in part, because inclusion in the Index may lead to closer scrutiny of management which, in turn, may lead to better performance. However, our tests do not allow us to reject an alternative possibility. In particular, it may be that, despite its assertions to the contrary, S&P (perhaps unknowingly) embeds some analysis of the future prospects of the candidate companies when it chooses one to be included in the Index. It may be that S&P (unknowingly) has access to information not available to other market participants. Alternatively, S&P may simply have superior analytical abilities. Over time, investors may have recognized this fact. If so, it could be that investors and analysts rationally revise upward their earn-

ings expectations in response to S&P's decision to add a company to the Index. If that is the case, the positive announcement period excess return, along with revisions in analysts' forecasts, are rational responses to S&P's decision to include a company in the Index.

Our tests based on earnings forecasts and realized earnings do not allow us to distinguish between the above two explanations. It is not our intention, however, to sort out whether the cause-and-effect chain runs from Index inclusion to better performance or whether the chain runs from (expectations of) better performance to Index inclusion. That we do not take up the task does not mean that it is inconsequential. Rather, our goal has been more modest. We have addressed the preliminary question of whether it is safe to assume that an announcement of a stock's impending inclusion in the S&P 500 Index is information free. Our analyses of earnings forecasts and realized earnings indicate that it is not.

The fact that addition to the S&P 500 is an information event is interesting in its own right. In addition, however, it has implications for empirical evidence on the shape of demand curves for common stocks. To date, studies that document positive average stock price reactions to announcements that a stock is to be included in the S&P 500 Index have often been interpreted as providing some of the powerful evidence that such demand curves slope downward. These studies generally start with the presumption that Index inclusion is an information-free event. Our results undermine that presumption; there does appear to be positive information in the addition of a firm to the S&P 500. This does not preclude there being a downward-sloping demand curve effect as well. However, tests of the downward-sloping demand curve hypothesis that are based on additions to the S&P 500 Index must control for the apparent information content embedded in such announcements before reaching any conclusions.

REFERENCES

- Bagwell, Laurie S., 1992, Dutch auction repurchases: An analysis of shareholder heterogeneity, *Journal of Finance* 47, 71–105.
- Beneish, Messod D., and Robert E. Whaley, 1996, An anatomy of the "S&P Game": The effects of changing the rules, *Journal of Finance* 51, 1909–1930.
- Brown, Lawrence, 2001, A temporal analysis of earnings surprises: Profits versus losses, *Journal of Accounting Research* 39, 221–241.
- Diether, Karl B., Christopher J. Malloy, and Anna Scherbina, 2002, Differences of opinion and the cross section of stocks returns, *Journal of Finance* 57, 2113–2141.
- Dhillon, Upinder, and Herb Johnson, 1991, Changes in the Standard and Poor's 500 List, *Journal of Business* 64, 75–85.
- Harris, Lawrence, and Eitan Gurel, 1986, Price and volume effects associated with changes in the S&P 500 list: New evidence for the existence of price pressures, *Journal of Finance* 41, 815–829.
- Jain, Prem C., 1987, The effect on stock price of inclusion in or exclusion from the S&P 500, *Financial Analysts Journal* 43, 58–65.
- Loderer, Claudio, John W. Cooney, and Leonard D. Van Drunen, 1991, The price elasticity of demand for common stock, *Journal of Finance* 46, 621–651.
- Lynch, Anthony W., and Richard R. Mendenhall, 1997, New evidence on stock price effects associated with changes in the S&P 500 Index, *Journal of Business* 70, 351–383.
- Masalis, Ronald W., 1980, The effects of capital structure change on security prices: A study of exchange offers, *Journal of Financial Economics* 8, 139–178.

- Mikkelson, Wayne H., and M. Megan Partch, 1985, Stock price effects and costs of secondary distributions, *Journal of Financial Economics* 14, 165–194.
- Richardson, Scott, Siew H. Teoh, and Peter D. Wysocki, 2001, The walkdown to beatable analysts forecasts: The roles of equity issuance and insider trading incentives, MIT Sloan Working Paper No. 4221-01.
- Scholes, Myron S., 1972, The market for securities: Substitution versus price pressure and the effects of information on share price, *Journal of Business* 45, 179–211.
- Shleifer, Andrei, 1986, Do demand curves for stocks slope down? *Journal of Finance* 41, 579–590.
- Standard and Poor's, July 9, 2002a, Focusing the S&P 500 on U.S. large cap stocks and the removal of non-U.S. companies in the S&P 500. Press release.
- Standard and Poor's, November 22, 2002b, Standard & Poor's Announces Changes in the S&P/TSX Venture Composite Index. Press release.
- Wurgler, Jeffrey, and Ekaterina V. Zhuravskaya, 2002, Does arbitrage flatten demand curves for stocks?, *Journal of Business* 75, 583–608.