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Media coverage, analyst recommendation upgrade and information content of inclusions into S&P indexes

Abstract

This paper investigates the impact of media coverage, especially those that mention analyst recommendation upgrades, on the widely documented price premium effect of firms that are newly included in the three major Standard and Poor's stock indexes: S&P 500, MidCap 400 and SmallCap 600. The sample covers 256 new inclusion cases in the 2009-2011 period. The author finds favorable media coverage is significantly associated with permanent price effect, and this effect is more pronounced for the small cap index and for newly included stocks that are not upgraded from another index. It is also discovered that media coverage of the index inclusion event and analyst recommendation upgrades of the newly included firms mentioned in media are positively related to optimistic consensus earnings forecast, but only analyst upgrades are associated with deteriorated forecast accuracy, indicating a fine difference in the information content such media coverage conveys. These findings are consistent with the "investor awareness" explanation as in Chen et al. (2004), and a similar pattern of results are found for the index deletion cases in the same time period.

Keywords: media coverage, analyst recommendation, optimism, investor awareness, S&P index, price effect.
JEL Classifications: G12, G14, G29.

Introduction

This paper investigates the impact of financial media coverage on the price premium effect of firms that are newly included in Standard and Poor's stock indexes. Positive price effect and an overall optimistic earnings forecast update on stocks that are newly added to the Standard and Poor's 500 index are widely recognized in the literature. That is, stock price increases around index inclusion and is sustained in that level afterwards (no significant price reversion) for S&P 500 index (Chen et al., 2004; Cai, 2007; Hrazdil, 2009). Trading volume subsequently increasesand bid-ask spread decreases (Hegde and McDermott, 2003; and Becker-Blease and Paul, 2006) for these stocks, too. In addition, upward-biased analyst earnings forecasts and deteriorated forecast accuracy (Denis et al., 2003; and Zhang et al., 2010) are documented in the literature, indicating very little additional information analysts add to the information content revealed in the announcement of S&P 500 index addition.

The two smaller market cap indexes, namely the S&P MidCap 400 and SmallCap 600, have recently gained more research focus, and the findings are mixed compared with that of S&P 500: stock liquidity and investor recognition increase following inclusion, but the price effect is not permanent (Shankar and Miller, 2006; and Becker-Blease and Paul, 2010).

This study focuses on the media coverage of the event of index inclusion and examines all three indexes. Specifically, the research questions are: Does media coverage other than the index announcement itself convey additional information to the investors? Does media mentioning of analyst recommendation upgrade contribute to the observed price premium effect? If so, are the impacts similar for large, mid and small cap index component stocks?

The addition of stocks in the Standard and Poor's indexes, unlike those in the Russell indexes, does not rely on a set of publicly known criteria (such as a threshold of market capitalization as of a specific date) and hence is more difficult to be anticipated beforehand. This crucial feature makes the addition of a stock in an S&P index a natural experiment to study the reaction from the financial industry and general investors. Meanwhile, compared with the Dow Jones Industrial Average, the width of S&P indexes and the frequency of index component changes enable researchers to form samples of a decent size for cross section and time series studies.

Using a sample of 256 new inclusions of firms into the three S&P indexes in the 2009-2011 period, I document that favorable media coverage is significantly associated with permanent price effect, and this effect is more pronounced for the small cap stock index and for stocks that are newly included instead of being upgraded from another index. This paper also finds that media coverage and analyst recommendation upgrades mentioned in media are positively related to optimistic earnings forecast, but only analyst upgrades are associated with deteriorated forecast accuracy. This result indicates a fine difference in the information content and value to the investors such media coverage conveys.

The aforementioned literature can be categorized into at least four different theories to explain the price effect of index inclusion. Among those the

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Information Content hypothesis (the addition conveys vague information of positive future performance) and the Liquidity hypothesis (the addition brings higher visibility and trading volume from at least index-tracking funds) are particularly related with the role of financial media and analysts. This paper's findings are consistent with the information content and "investor awareness" explanation as in Chen et al. (2004).

Extant research also links media coverage with stock return. Theoretically, media coverage can carry new information, raise investor awareness, drive market sentiment and thus affect stock returns. Tetlock (2007) and Fang and Peress (2009) both find direct relationship between media coverage and stock return, supporting the claim of news driving noise/liquidity traders. This price effect is more pronounced for small stocks and stocks with low analyst following. More focused on information and investor sentiment, Vega (2006) and Lin (2009) find the price effect is sensitive to the existence of uninformed traders and firm size, in the settings of post earnings announcement drift and month-by-month sentiment/return comparison, respectively.

There, to the author's best knowledge, has not been any other research that specifically addresses the questions raised in this paper, either on index inclusion media coverage or on the differences among the larger stock indexes and the smaller ones. This study is among the earliest to directly connect media coverage with the S&P index changes. The findings in this paper contribute to the literature by providing new evidence on the information content contained in the index addition media coverage. This paper supports the claim of investor awareness effect by presenting the positive relation between media coverage (especially analyst recommendation upgrade) and the price effect, as well as the relationship between media coverage and earnings forecast optimism. It also illustrates that more awareness does not necessarily lead to more transparent information environment for earnings forecast accuracy. Finally, it compares all three major S&P indexes: the S&P 500, the MidCap 400 and the SmallCap 600, in a cohesive way, extends the literature on index adjustments and provides insight for policy makers regarding a more transparent capital market and the composition of highly representative stock indexes.

The remainder of this paper is organized as follows. Section 1 describes the data collection, explains sample construction and outlines the research questions in a cohesive framework of empirical design. Empirical findings and explanations are presented in section 2, with a supplementary summary of results from studying the deletion of firms from the S&P indexes. The final section concludes the paper.

1. Data, variables and empirical design

This study employs hand-collected data from the past three years (2009-2011) on the new inclusions of the three major S&P indexes and the media coverage of such events from the universe of finance media (print and cyber) in LexisNexis Academic database for the window of (AD-120 days, LD+60 days) surrounding the announcement and listing of a firm being added to an index[1]. Analyst earnings forecast data from I/B/E/S, firm financial data from Compustat and stock return data from CRSP are merged with the hand-collected data. Following Becker-Blease and Paul (2010), downsized firms moving from a larger index to a smaller index (such as from MidCap 400 to SmallCap 600) are excluded. The final sample covers 256 cases. It contains 64 new inclusions into S&P 500, 95 new inclusions into MidCap 400, and 97 new inclusions into SmallCap 600. The detailed distribution of the additions, media coverage counts and analyst recommendation upgrades being mentioned in media are summarized in Table 1. In Panel A we observe that, on average, more than half of S&P 500 and MidCap 400 additions are firms that are previously included in a smaller cap index. The average finance media coverage count is higher for S&P 500 additions (7.6 times in the 180 days window), compared with 6.1 times for MidCap 400 additions and 5.8 times for SmallCap 600 additions. Similar patterns are found in the average count of media-mentioned analyst recommendation upgrades. In panel B, we find the year 2010 has slightly higher number of index additions, partially indicating the post-crisis adjustment of the S&P stock indexes. For the same year, finance media coverage and analyst recommendation upgrades are also higher, coinciding with the steady increase of index additions in 2010.

Table 1. Distribution and averages of index inclusions, media coverage and analyst recommendation upgrade

Panel A: Distribution by index				
Index	*N*	Upward addition from other index	Mean count of media coverage	Mean count of media-mentioned analyst recommendation upgrade
S&P 500	64	35	7.6	2.2
MidCap 400	95	52	6.1	1.4
SmallCap 600	97	0	5.8	1.6
Panel B: Distribution by year				
Year	*N*	Upward addition from other index	Mean count of media coverage	Mean count of media-mentioned analyst recommendation upgrade
2009	81	27	6.2	1.5
2010	91	31	6.9	2.3
2011	84	29	6.4	1.6

[1] AD is index addition announcement date. LD is actual list date.

The framework of empirical tests is constructed to address the following testable hypotheses. First, are there changes in media coverage and analyst recommendation in the window of (AD-120 days, LD+60 days) surrounding the announcement date and actual list date? I conduct a set of univariate comparison of media coverage counts, and within those media stories the counts of analyst recommendation upgrades, before and after the inclusion into an S&P index.

Next I run a set of cross-section regressions of price effecton media coverage and analyst recommendations, controlling for firm fundamentals and analyst coverage variables. This set of test is to answer the research question on whether media coverage other than the index announcement itself conveys additional information to the investors and thus contribute to the price effect. The abnormal return (*AbRet*) is defined as the alpha in the Fama and French (1993) three factor model, using parameters estimated from the (AD-120 days, AD-30 days) returns[1]. For robustness, various windows surrounding the announcement date (AD) and the actual list date (LD) are employed to define abnormal returns. The estimation equation is:

$$AbRet = \beta_0 + \beta_1 Media + \beta_2 AnalystUp + \\ + \beta_3 Index + \beta_4 NewMember + \Gamma' Controls, \quad (1)$$

where the key independent variables are count of media stories (*Media*), the count of media coverage on analyst recommendation upgrade (*AnalystUp*), the size-ordered identification of the index the firm joins (*Index*, 1 = S&P 500, 0 = MidCap 400, -1 = SmallCap 600), and the dummy variable of whether this addition is completely new (takes value 1) instead of an upward movement from a smaller index (*NewMember*). The control variables include firm debt/equity ratio, past year sales growth, and the number of analysts who cover the firm in the past year.

To further disentangle the effect of media mentioning of analyst recommendation upgrade on the observed analyst earnings forecast optimism and accuracy with regard to realized earnings, I conduct a set of longitudinal data regressions of analyst forecast bias and accuracy on media coverage and analyst recommendations, controlling for firm fundamentals and analyst coverage variables. The estimation equations are:

$$Bias = \theta_0 + \theta_1 Media + \theta_2 AnalystUp + \\ + \theta_3 Index + \theta_4 NewMember + \Gamma' Controls, \quad (2)$$

$$Accuracy = \theta_0 + \theta_1 Media + \theta_2 AnalystUp + \\ + \theta_3 Index + \theta_4 NewMember + \Gamma' Controls, \quad (3)$$

where *Bias* is signed one-year ahead earnings forecast error from consensus forecasts for the quarter the announcement is made (analyst consensus forecast – actual realized earnings) normalized by previous year closing stock price, and *Accuracy* is the negated absolute one-year ahead earnings forecast error from consensus forecasts for the quarter when the announcement is made (-|analyst consensus forecast – actual realized earnings|) normalized by previous year closing stock price[2]. Independent variables and control variables are similarly defined as from the previous empirical model.

2. Empirical results, interpretation and additional analysis

This section presents empirical findings and provides some new interpretations regarding the role of finance media and analyst coverage. The univariate comparison of finance media coverage and analyst recommendation upgrades sorted by index and distinguished by before and after the announcement date is summarized in Table 2. The autocorrelation-adjusted *t*-statistics of two sample tests are reported underneath the difference numbers.

Table 2. Univariate comparison of media coverage before and after index inclusion announcement

Index	Source	*N*	Within 120 days before announcement date		Within 60 days after announcement date		(3)-(1)	(4)-(2)
			(1) Mean count of media coverage	(2) Mean count of media-mentioned analyst recommendation upgrade	(3) Mean count of media coverage	(4) Mean count of media-mentioned analyst recommendation upgrade		
S&P 500	Completely new addition	29	2.7	0.3	5.9	2.4	3.2*** (2.74)	2.1*** (2.09)
S&P 500	Upward addition from other index	35	1.6	0.1	4.9	1.6	3.3*** (2.90)	1.5*** (2.21)

[1] Following Shankar and Miller (2006), I also used the raw return minus the corresponding index return as an alternative measure of the abnormal return. The results are not qualitatively changed.

[2] The absolute forecast error is the opposite of accuracy. By negating the absolute forecast error, we obtain values from negative infinity to zero, with zero being 100% accurate.

Table 2 (cont.). Univariate comparison of media coverage before and after index inclusion announcement

Index	Source	*N*	Within 120 days before announcement date		Within 60 days after announcement date		(3)-(1)	(4)-(2)
			(1) Mean count of media coverage	(2) Mean count of media-mentioned analyst recommendation upgrade	(3) Mean count of media coverage	(4) Mean count of media-mentioned analyst recommendation upgrade		
Difference (new-upward) within S&P 500:			1.1*** (2.43)	0.2** (1.89)	1.0** (1.88)	0.8*** (2.16)		
MidCap 400	Completely new addition	52	2.2	0.2	4.7	1.6	2.5*** (3.17)	1.4*** (2.67)
MidCap 400	Upward addition from other index	43	1.8	0.1	3.9	0.7	2.1*** (2.98)	0.6*** (3.03)
Difference (new-upward) within MidCap 400:			0.4** (1.91)	0.1* (1.71)	0.8** (1.99)	0.9*** (2.21)		
SmallCap 600		97	1.3	0.6	4.4	1.0	3.1*** (4.16)	0.4** (1.93)

Notes: The autocorrelation-adjusted *t*-statistics of two sample tests are reported underneath the difference numbers. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

In the two columns to the right end in Table 2 we observe that there is significantly more media coverage of the added component firms for all three indexes in the period after the announcement date. Even if the window for the after-announcement period is only 60 days compared with 120 days before announcement, most media coverage concentrates within this period, indicating the nature of unpredictability of the S&P's decision to adjust its indexes. The vast amount of media coverage in the post-announcement period also reveals the investors' interest in trading these stocks even after the event happens, which is in line with the long-observed post-event price drift phenomenon. Similar patterns are observed in the analyst recommendation upgrades mentioned in finance media, indicating that analysts do not appear to have superb ability to tip investors off before the announcement of index addition. Rather, analysts increase research and realize the residual upward potential of the stock price even after it is announced to be a new index member, thus providing an upgrade of their recommendations.

Within the S&P 500 and the MidCap 400 indexes, I provide comparison of media coverage and analyst recommendation upgrades between the firms that are completely new (not a member of other indexes previously) and the firms that are moved upward from a smaller cap index. Significantly more media coverage and analyst recommendation upgrades are found for the completely new component stocks. The interpretation of this observation resides in the "investor awareness" argument about the information content of index addition announcements: When a firm is previously an index member, moving to a new and larger cap index does not provide as much insightful information to the investors as when a firm is a completely new one and added to an index for the first time.

The price effect regression (equation (1)) results are summarized in Table 3. Standard errors are reported underneath the parameter estimates. I use various windows surrounding AD and LD to define abnormal returns and use them as the independent variable, namely *AbRet* (AD-30, AD-1), *AbRet* (AD), *AbRet* (LD), *AbRet* (AD+1, LD-1), *AbRet* (LD+1, LD+30) and *AbRet* (LD+1, LD+60). Media coverage counts and analyst upgrades are consistently found to be positively and significantly related with abnormal returns in all windows. This finding again proves that index addition is an event that contains new information about either the firm fundamentals or the market sentiment, thus generating positive abnormal returns, both before and after the announcement and listing.

Table 3. The influences of media coverage and analyst recommendation on price effect of index additions

Dependent variable: abnormal return						
	AbRet (AD-30, AD-1)	*AbRet* (AD)	*AbRet* (LD)	*AbRet* (AD+1, LD-1)	*AbRet* (LD+1, LD+30)	*AbRet* (LD+1, LD+60)
Media	0.25*** (0.10)	0.19*** (0.09)	0.11** (0.06)	0.27*** (0.11)	0.41*** (0.16)	0.39*** (0.18)
AnalystUp	0.31*** (0.11)	0.27*** (0.13)	0.20** (0.11)	0.29*** (0.13)	0.62*** (0.25)	0.77*** (0.31)
Index	0.09 (0.12)	0.12* (0.07)	0.06 (0.05)	0.11* (0.06)	0.16** (0.09)	0.23*** (0.10)

Table 3 (cont.). The influences of media coverage and analyst recommendation on price effect of index additions

Dependent variable: abnormal return						
	AbRet (AD-30, AD-1)	*AbRet* (AD)	*AbRet* (LD)	*AbRet* (AD+1, LD-1)	*AbRet* (LD+1, LD+30)	*AbRet* (LD+1, LD+60)
NewMember	0.17*** (0.04)	0.25*** (0.08)	0.17* (0.10)	0.26** (0.13)	0.39*** (0.16)	0.41*** (0.19)
Debt/equity	-0.11 (0.32)	-0.07 (0.25)	-0.02 (0.22)	-0.03 (0.19)	-0.01 (0.12)	-0.04 (0.16)
Sales growth	0.26** (0.14)	0.28** (0.15)	0.24* (0.13)	0.21** (0.11)	0.26*** (0.11)	0.27*** (0.13)
Analyst coverage	0.18*** (0.07)	0.17*** (0.05)	0.14** (0.08)	0.21*** (0.09)	0.30*** (0.12)	0.38*** (0.16)
N	256	256	256	256	256	256
Adj. R^2	5.10%	6.18%	4.56%	7.91%	9.22%	8.12%

Notes: *AbRet* is Fama-French (1993) three factor model alpha estimated using the (AD-120 days, AD-30 days) returns. AD is index addition announcement date. LD is actual list date. The independent variables are count of media stories (*Media*), the count of stories about analyst recommendation upgrade (*AnalystUp*), the size-ordered identification of the index the firm joins (*Index*, 1 = S&P 500, 0 = MidCap 400, -1 = SmallCap 600), and the dummy variable of whether this addition is completely new (takes value 1) instead of an upward movement from a smaller index (*NewMember*). Standard errors are reported underneath the parameter estimates. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

In Table 3 we also observe that the identification of index is significant in the longest post-event window (LD+1, LD+60). This result indicates that the permanent price effect is more pronounced in large cap index (S&P 500), and this finding is in line with the price reversion of SmallCap 600 additions found in Shankar and Miller (2006). In addition, the dummy variable *NewMember* is found to be positively and significantly associated with abnormal returns in all return windows. This result echoes the univariate comparison in the previous table and indicates that there is more new information disclosed for firms that are not previously a component of any index, thus generating more positive abnormal returns as investors find this stock to be new and with good potentials. These findings are consistent with those in Vega (2006), Tetlock (2007) and Lin (2009). That is, media coverage plays an important role driving noise trader behavior, thus affecting market sentiment and stock return in the short term. As it is found in these previous studies, the price effect is more pronounced for small stocks (in my settings, those included in SmallCap 600) and it is less permanent. In other words, price revision happens in larger degrees for small cap index inclusion cases, and those in S&P 500 index is more permanent.

Among the control variables, sales growth (a proxy for earnings growth potential) and analyst coverage are both found to be positively related to abnormal returns. Leverage ratio does not return similar consistent result. The adjusted R^2 of all models in this table is below 10%, indicating that there may be more factors contributing to the abnormal returns that we observe.

I further examine the effect of media coverage and mentioning of analyst recommendation upgrade on the observed analyst earnings forecast optimism and accuracy. The results from the aforementioned earnings forecast regressions (equations (2) and (3)) are presented in Table 4. Standard errors are reported underneath the parameter estimates. Zhang et al. (2010) document overoptimistic forecasts, decreased accuracy and increased dispersion among analyst earnings forecasts. The consensus forecast bias and consensus forecast accuracy are used as independent variables in two models, respectively.

Table 4. The effect of media coverage and analyst recommendation on the performance of analyst consensus earnings forecasts

Dependent variable	Model 1 Consensus forecast bias	Model 2 Consensus forecast accuracy
Media	0.21*** (0.09)	0.14* (0.08)
AnalystUp	0.17** (0.09)	-0.13** (0.07)
Index	-0.11* (0.06)	0.07** (0.04)
NewMember	0.31*** (0.12)	-0.09** (0.05)
Debt/equity	-0.07 (0.17)	-0.06 (0.12)
Sales growth	0.21* (0.12)	0.19 (0.11)

Table 4 (cont.). The effect of media coverage and analyst recommendation on the performance of analyst consensus earnings forecasts

Dependent variable	Model 1 Consensus forecast bias	Model 2 Consensus forecast accuracy
Analyst coverage	0.20* (0.11)	0.18** (0.09)
N	256	256
Adj. R^2	11.3%	9.29%

Notes: Forecast bias is signed one-year ahead earnings forecast error from consensus forecasts for the quarter the announcement is made (analyst consensus forecast – actual realized earnings) normalized by previous year closing stock price. Forecast accuracy is the negated absolute one-year ahead earnings forecast error from consensus forecasts for the quarter the announcement is made (-|analyst consensus forecast – actual realized earnings|) normalized by previous year closing stock price. The independent variables are count of media stories (*Media*), the count of stories about analyst recommendation upgrade (*AnalystUp*), the size-ordered identification of the index the firm joins (*Index*, 1 = S&P 500, 0 = MidCap 400, -1 = SmallCap 600), and the dummy variable of whether this addition is completely new (takes value 1) instead of an upward addition from a smaller index (*NewMember*). Standard errors are reported underneath the parameter estimates. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

In the first model of Table 4, media coverage and analyst recommendation upgrade are both found to be positively and significantly associated with the consensus forecast bias. These findings reiterate the role of increased media exposure and analyst coverage in driving up optimism among investors. The index identification is marginally significantly and negatively associated with the consensus forecast bias, indicating that more optimism exists for smaller cap index stocks that are included in the SmallCap 600 index. The coefficient estimate for *NewMember* dummy is highly significant and positive, and this result illustrates that when a firm is introduced to an index for the first time, this new and additional exposure largely boosts optimism of its earnings potentials, even for investment professionals like financial analysts.

In the second model of Table 4, the results are quite mixed for consensus forecast accuracy. Media coverage is marginally and positively associated with the consensus forecast accuracy, indicating that more information disclosure increases the transparency and makes the firm earnings more predictable. However, analyst recommendation upgrade is significantly and negatively related to forecast accuracy, and this result indicates that the select analysts who upgrade recommendations and gain media coverage do not necessarily obtain private information regarding a promising next year earnings. This finding calls for cautiousness when following the so-called star analysts' recommendations.

In the second model, index identification is positively associated with forecast accuracy, indicating larger cap stocks are more transparent and thus predictable. The *NewMember* dummy variable is negatively associated with accuracy, and this result reveals that even if the completely new component stocks receive more media coverage and analyst upgrades (mostly to be an initiation of recommendation and most of them are "buy" recommendations), they are still relatively opaque and hard to forecast.

The findings in Table 3 and Table 4 jointly reinforce the "investor awareness" hypothesis as proposed in Chen et al. (2004). As increased media coverage and guidance from upgraded analyst recommendations pose seemingly profitable investment opportunities to investors, the resulting investor sentiment largely drives the order flows and thus influences the prices and abnormal returns. This relationship holds for various windows that define abnormal returns and also for the study of consensus forecast optimism. However, the increased investor awareness does not necessarily translate into more transparent information content and this claim is evident as we connect analyst recommendation upgrades with consensus earnings forecast accuracy. Rather, it is the identification of the index (larger size of the firms included in the index) and the fact that a firm was previously a member of a smaller index and is being moved upwards to a largercap index that jointly contribute to an improved accuracy in the consensus earnings forecast.

As an informative supplement, it is interesting to continue exploring the deletion of firms from the S&P indexes and whether/how media coverage (mostly on firm fundamentals and earnings prospect, as analysts are known to be reluctant to downgrade their recommendations) are associated the observed negative price effect and the deterioration of realized earnings. Studying the deletion cases poses a challenge though for the setting of this paper as media mentioning is substantially lower for deletions, and analysts are reluctant to downgrade recommendations. If anything, they stopped following the firm, especially if the firm was acquired by a larger company. For those merger cases, studying the subsequent deterioration of realized earnings is not possible. Thus, I focus on the influence of media coverage counts on the price effect of the deleted firms.

I compile the 256 corresponding deletions of firms from all three indexes for the same 2009-2011 period, and firstly find that negative returns do prevail in all

windows surrounding the AD and LD dates. A dummy variable of whether this deleted firm is completely dropped from all S&P indexes (takes value 1) instead of a downward movement to a smaller index is created and denoted by *PermDrop*, and a dummy variable of whether the firm is deleted because it is acquired by a larger company (*Acquired*) is also added. These two variables, together with *Media* and *Index*, construct the main independent variables for a similar study as in equation (1).

Table 5 summaries the results linking abnormal returns for deleted firms with media coverage, index identification, control for permanent deletion, control for being acquired and several other control variables. Standard errors are reported underneath the parameter estimates. Media coverage is consistently found to be negatively and significantly associated with abnormal returns in all windows. The identification of index has negative coefficient and it is significant in the longer post-event windows (LD+1, LD+30) and (LD+1, LD+60). This result indicates that the permanent price effect is more pronounced in large cap index (S&P 500), especially when downward movement into smaller indexes is controlled for.

Table 5. The influence of media coverage on price effect of index deletions

Dependent variable: abnormal return						
	AbRet (AD-30, AD-1)	*AbRet* (AD)	*AbRet* (LD)	*AbRet* (AD+1, LD-1)	*AbRet* (LD+1, LD+30)	*AbRet* (LD+1, LD+60)
Media	-0.19*** (0.07)	-0.17*** (0.07)	-0.21** (0.11)	-0.26** (0.14)	-0.33*** (0.14)	-0.40*** (0.16)
Index	-0.12 (0.17)	-0.14 (0.16)	-0.22 (0.19)	-0.25* (0.14)	-0.32** (0.16)	-0.37*** (0.17)
PermDrop	-0.19** (0.10)	-0.21* (0.11)	-0.09 (0.06)	-0.14** (0.07)	-0.22*** (0.09)	-0.28*** (0.11)
Acquired	0.17*** (0.06)	0.15*** (0.06)	0.11** (0.06)	0.19** (0.10)	0.26*** (0.12)	0.33*** (0.14)
Debt/equity	0.26 (0.20)	0.19 (0.16)	0.07 (0.12)	0.09 (0.06)	0.11 (0.10)	0.15 (0.11)
Sales growth	0.22*** (0.10)	0.31** (0.16)	0.06* (0.10)	0.18* (0.10)	0.20*** (0.09)	0.24*** (0.11)
Analyst coverage	0.11*** (0.04)	0.14*** (0.06)	0.10** (0.05)	0.17*** (0.08)	0.27*** (0.12)	0.31*** (0.14)
N	256	256	256	256	256	256
Adj. R^2	4.98%	5.81%	5.11%	6.32%	8.94%	8.36%

Notes: *AbRet* is Fama-French (1993) three factor model alpha estimated using (AD-120 days, AD-30 days) returns. AD is index deletion announcement date. LD is actual list date. The independent variables are count of media stories (*Media*), the size-ordered identification of the index the firm joins (*Index*, 1 = S&P 500, 0 = MidCap 400, -1 = SmallCap 600), the dummy variable of whether this deleted firm is completely dropped from all S&P indexes (takes value 1) instead of a downward movement toa smaller index (*PermDrop*), and the dummy variable of whether the firm is deleted because it is acquired by a larger company (*Acquired*). Standard errors are reported underneath the parameter estimates. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

The two new dummy variables, *PermDrop* and *Acquired*, are both significant with opposite signs of coefficients. This finding indicates that investors view the permanent drop as a piece of extremely bad and irreversible news, and the fact that the firm is being acquired and effectively joining a rank of larger companies or even larger cap indexes alleviates the negative price effect of index deletion. The control variable "analyst coverage" also partially alleviates the negative price effect of index deletion, and this result is consistent with that in Fang and Peress (2009): analyst coverage serves as a way to provide guidance and offset the sentiment generated by media coverage in the absence of transparent information.

Concluding remarks

This study targets the frontier of research on index addition price effect by linking finance media and analysts' coverage with the widely investigated price effect and earnings forecast optimism of stocks added into an S&P stock index. It discovers that media coverage in the (AD-120 days, LD+60 days) window surrounding the announcement date and actual list date play a significant positive role in the observed price effect. Optimistic earnings forecasts are also found to be significantly associated with media coverage and analyst recommendation upgrades. However, upgraded recommendations from analysts impact forecast accuracy negatively, indicating that the investor awareness generated by media coverage and analyst upgrades only have a price impact but do not necessarily improve the information transparency.

This study is one of the first to directly connect media coverage with the S&P index changes. The contribution of this paper comes from providing new evidence on the information content of media coverage of index addition events. This study echoes the claim

in Chen et al. (2004) on investor awareness by presenting the positive relationship between media coverage (especially analyst recommendation upgrade) with the price effect and the earnings forecast optimism. It also illustrates that more awareness does not lead to more transparent information environment for earnings forecast. Finally, it compares all three major S&P indexes in a cohesive framework and extends the literature on index composition and adjustments.

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