IBEX 35 *Inclusiones* and *Exclusiones*

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The extant evidence on S&P 500 Index additions reports a permanent price effect to news of index membership. This general result is consistent with long-run downward sloping demand curves for stocks. However, it is well-known that S&P 500 Index additions are based on a variety of criteria *secretly* espoused by S&P. It may well be that the permanent price effect to S&P 500 Index additions is an index-compiler certification effect, whereby the S&P, may unknowingly, certify stocks for index inclusion resulting in a permanent price effect. IBEX 35 Index additions (and deletions) in comparison are determined solely on stock liquidity and thus absent such certification. In this setting, we test whether demand curves for stocks are downward sloping in the long-run. Contrary to the findings on S&P 500 Index changes, our results are most consistent with *short-run* downward sloping demand curves for Spanish stocks, after we account for a contemporaneous increase in long-run earnings in firms removed from the IBEX 35 Index.

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Academics and industry practitioners have devoted considerable effort to establish whether stocks have perfect substitutes that give rise to horizontal demand curves. If demand curves for stocks are horizontal then any surges in either demand or supply absent new information should have little effect on prevailing stock prices. Examination on changes to equity index constituents presents an ideal setting to test whether changes in stock prices occur in the absence of new information.

The extant evidence on equity index changes has focused on the S&P 500 Index. From an inspection of these studies, Harris and Gurel (1986) and Lynch and Mendenhall (1997) report results consistent with price pressure effects and short-term downward sloping demand curves for stocks. If stocks have short-term downward sloping demand curves then the stock price should only momentarily be affected by a change in demand induced by S&P 500 indexing. Any temporary price-pressure should dissipate once excess demand for the stock is satisfied. If the stock price is permanently affected by S&P 500 indexing then evidence is consistent with long-run downward sloping demand curves for stocks. Studies by Shleifer (1986), Goetzmann and Garry (1986), Jain (1987), Dhillon and Johnson (1991), Beneish and Whaley (1996), Blouin, Raedy, and Shackelford (2000), Blume and Edelen (2001), Chordia (2001), Wurgler and Zhuravskaya (2002), Elliott and Warr (2003), Hegde and McDermott (2003), and Denis, McConnell, Ovtchinnikov, and Yu (2003), hereafter DMOY (2003) report a permanent stock price effect to index additions which is consistent with long-run downward sloping demand curves for stocks.

Long-run stock price effects to index changes do not always support downward sloping demand curves. If the permanent change in stock price is contemporaneous with a change in the required rate of return, a change in expected earnings, or certification by index compilers, then the belief that demand curves are downward sloping may be misplaced. For example, Jain (1987), Dhillon and Johnson (1991), DMOY (2003), Hegde and McDermott (2003) and Chen,

Noronha, and Singhal (2004), hereafter CNS (2004), among others, show that permanent price effects to S&P 500 Index additions are also consistent with information content that (a) causes index inclusion and/or (b) leads to an improvement in corporate performance. In establishing whether stock price effects occur in the absence of new information, academic studies have been unable to isolate information contained in S&P certification that might elicit a stock inclusion- - due to the secretive selection process espoused by the S&P in constructing the S&P 500 Index - - apart from other contemporaneous effects such as changes in earnings and/or the required rate of return that might elicit performance improvements as a direct consequence of index addition (or deletion).

It is this possibility that gives rise to our analysis of IBEX 35 Index changes. Unlike the S&P 500 Index, the IBEX 35 comprises stocks ranked solely on liquidity as measured by turnover and trading volume. To construct the IBEX 35, all companies listed on the Spanish Stock Exchanges are ranked according to liquidity and the thirty-five most liquid stocks in terms of turnover and trading volume form the IBEX 35 Index. Changes in the composition of the IBEX 35 Index are therefore automatic and preclude index compiler certification. To explore whether changes in stock prices occur in the absence of certification, we perform a battery of tests on stock prices, realized earnings (and expectations), financing, information production, and equity ownership of companies that experience IBEX 35 Index changes from 1992 through 2003.

We begin with an event study on stock prices and trading volume surrounding announcements of additions and deletions to the IBEX 35 Index. We find index additions are associated with a positive stock price response that is reversed over a 20-day period following news of the index change. Deletions to the index are associated with a negative stock price response that is reversed over a 30-day period after news of the event. The event study results support the price pressure hypothesis and are therefore most consistent with short-term downward sloping demand curves for stocks.

Examination of long-run price effects to index changes uncovers a sustained increase in stock prices for up to two years after announcements of index deletions, but no sustained price

change to index additions. The long-run price effects to IBEX 35 Index changes present a *fly-in-the-ointment*, for two reasons. First, the stock price effect to index deletions should be negative (and not positive) to credibly support the view of long-run downward sloping demand curves for stocks (see DMOY (2003)). And second, the arguments advanced in support of *short- and long-run* downward sloping demand curves requires a symmetric price effect to index additions and deletions (see CNS (2004)).

Nonetheless, the asymmetric result might be explained by a change in the required return and/or expected earnings in the aftermath of the index change. To explore these further, as a first pass, we examine earnings forecasts (and realized earnings) of newly added and deleted firms. We find no significant deviation in expected or actual earnings in companies added to the index. But, we do observe a significant up-tick in both expected and realized earnings in companies recently deleted from the index. It would seem that the permanent price effect to index deletions can, at least in part, be explained by an increase in contemporaneous earnings for companies no longer members of the IBEX 35 Index.

We then examine factors that might engender a change in the required rate of return in newly added and deleted companies. To that end, we monitor the ability of firms to attract new capital by examining financing patterns, rudimentary proxies for information asymmetry and changes in equity ownership and Merton's Shadow cost for both IBEX 35 Index inclusions and exclusions. Our analyses reveal that neither index additions nor deletions are associated with any significant changes in debt or equity financing, information asymmetry as measured by a change in press coverage, or Merton's Shadow costs.

In a setting absent *index compiler* certification, the results herein show that liquidity effects primarily drive stock price behavior around IBEX 35 Index additions. The evidence on IBEX 35 Index deletions is less clear. Companies removed from the index are associated with an initial drop in price which is fully reversed thirty days after the initial announcement. Over the longer term, there is a sustained increase in the average stock price for this set of firms which is correlated with an increase in earnings expectations and realized earnings.

In a multivariate setting, after we control for the simultaneous increase in earnings in firms removed from the IBEX 35 Index, our findings appear most consistent with temporary price pressure effects that support belief of short-term downward sloping demand curves for stocks. As a further check on our results, we run formal tests centered on stock liquidity changes for sample index changes (e.g., Amihud (2002)). The results reveal only transitory deviations in stock prices to both IBEX 35 Index additions and deletions, which further supports the view that the demand curves for *Spanish* stocks is short-term downward sloping.

Nevertheless, we still have one unresolved issue. Up to this point, no rational explanation had been advanced for the improvement in earnings (and expectations) in the set of firms removed from the IBEX 35 Index. To address this concern, we examine whether earnings improvements can be explained by greater scrutiny and pressure exerted by investors and analysts that is directed at the managers of the companies recently removed from the index. Since no direct measure of scrutiny or pressure on managers exists, we scrutinize several proxies including the rate of 'forced' top management turnover, and asset and employee restructuring, from before to after the date of the IBEX 35 Index reconstitution.

This somewhat crude analysis reveals that the rate of 'forced' turnover in the top team increases by 16% following the removal of a firm from the IBEX 35 Index, which is accompanied by substantial reductions in the asset and employee bases of these companies. In comparison, we observed little to no significant changes in management turnover or asset/employee restructuring in the set of companies that was added to the IBEX 35 Index. Thus, increased investor and analyst scrutiny directed at managers that have been 'booted' from the IBEX 35 Index appears to elucidate the marked increase in earnings following the exclusion of the stock from the Index.

In sum, the evidence on IBEX 35 Index changes is most consistent with the dearth of studies on S&P 500 Index changes that favor short-run downward sloping demand curves for stocks (and at odds with the extant evidence in support of long-run downward sloping demand curves). The findings from this study also hint that index compiler certification may feature in

explicating the permanent price effect observed to S&P 500 Index additions, however an exact measurement on its impact, if any, is beyond the scope of this study.

The next section of this study provides information on the construction of the IBEX 35 Index and briefly reviews prior studies on index changes. Section II describes the sample and data. Section III reports the results of the short- and long-run stock price and volume effects. Section IV presents analyses on realized and forecast earnings. Section V documents changes in financing, equity ownership, and shadow costs before and after IBEX 35 Index changes. Section VI presents the multivariate analysis, Section VII presents robustness checks, and Section VIII concludes the paper.

I. Background

A. IBEX 35 Index

In comparison to the S&P 500, Dow 30, and FTSE 100, the IBEX 35 has a recent history that dates backs to 1988. Its origins can be traced to the Society Iberian OM (OMib) who in response to a growth in futures trading constructed an index, the FIEX 35, comprising thirty-five leading stocks listed on the Madrid Stock Exchange. In 1990, MEFF Renta Fija established a second Spanish futures market in Barcelona which resulted in the construction of a second equity index, the MEFF, comprising the largest stocks on the Barcelona Stock Exchange. The IBEX 35 Index was a result of consolidation of competing indexes on the Madrid and Barcelona Stock Exchanges. The IBEX 35 Index is a value-weighted index that was created as an investment instrument which would reflect the general behavior of Spanish equities and serve as an underlying asset for options and futures trading in Spain. The first trades on the IBEX 35 were made on January 14, 1992.

The IBEX 35 is the official index for the market segment of continuously traded stocks which is composed of the thirty-five most liquid equities quoted in cash *pesetas* among those listed on the joint stock exchange system of the four Spanish stock exchanges in Madrid, Barcelona, Bilbao, and Valencia. The IBEX 35 Index is revised on a semi-annual basis and

inclusion in the index is guaranteed for the thirty-five Spanish stocks that rank highest in terms of liquidity as measured by trading volume and turnover over a supervision period. The interval of six months prior to the start of January and July serves as the supervision period for the inclusion (and exclusion) of stocks to the IBEX 35 Index.

The composition of the IBEX 35 Index is amended for routine and special operations. The index turnovers that are of primary interest to us are routine additions and deletions which occur when a new stock is one of the thirty-five stocks that ranks highest in terms of liquidity and replaces a stock that is removed from the index. Those resulting from special operations are removed from our analysis because they elicit a change in the stable share ownership of the firm, which might itself convey new information to market participants. A shift in stable ownership can arise from mergers, acquisitions and restructuring activity. Stocks can also be deleted for special operations when (1) a large fraction of total share turnover is contracted by a single party, (2) a stock is thinly traded, (3) a stock undergoes a serious drop in liquidity, or (4) a stock is suspended from trading on the relevant exchange for a lengthy period.

A Technical Advisory Committee (TAC) led by a chairperson and comprising between five to nine members is responsible for the IBEX 35 Index and their main functions include: (1) supervising the calculation of the index in accordance with existing technical guidelines set forth by the Sociedad de Bolsas, SA; (2) examining the proper operation of the index as an underlying index for futures trading; (3) approving changes in the composition of the index every six months or whenever the Committee sees fit for operational reasons; and (4) reporting on technical aspects pertaining to the composition of the IBEX 35 Index. The TAC meets every six months to redefine the index for the following semi-annual period. TAC decisions on IBEX 35 Index composition made at ordinary meetings are published within 48 hours after the TAC meeting and are effective on the first day of the following month.[1]

[1] Any other actions taken at meetings in special session are generally released to the public immediately and become effective as prescribed by the TAC.

As noted above, the IBEX 35 comprises the thirty-five most liquid stocks quoted on the four Spanish stock exchanges over a six-month supervision period. The TAC determines the inclusion or exclusion of a stock to the IBEX 35 Index on trading volume (the number of orders in the order-driven market) and the quality of trading volume as measured by the characteristics and quantity of transactions made in the market including statistics on buy-sell spreads and turnover. Another key determinant for IBEX 35 inclusion is that a stock's average capitalization must be greater than 0.30% of the average index capitalization over the six-month supervision period. The TAC does not always require six months of data on a company for inclusion in the index and on rare occasion will include a stock if it meets the necessary liquidity requirements within 60 days of the supervision period. The TAC's only benchmark is therefore a stock's liquidity and that single observable measure forms the basis of the Committee's decisions regarding IBEX 35 Index addition or removal.

In sum, the role of the TAC is mechanistic and determined solely by a stock's relative liquidity ranking, such that composition of the IBEX 35 Index is in essence an automated process. In contrast, the S&P Committee utilizes a variety of criteria in their decisions to add and remove stocks from the S&P 500 Index including; stock liquidity, stock ownership concentration, profitability, and U.S. industry representativeness. Thus, the role of the S&P Committee in implementing S&P 500 Index changes is unclear and one akin to a private club with fraternal membership criteria.[2]

B. Prior literature on equity index changes

CNS (2004) provide a comprehensive survey of prior studies on S&P 500 Index changes, thus our review of this literature will be brief. Prior studies on S&P 500 Index changes can be broadly classified into three groups. The first group documents a surge (drop) in stock price to news of S&P 500 Index additions (deletions), which is reversed in subsequent weeks. Harris and

[2] Beneish and Whaley (1996) equated S&P 500 Index additions and deletions to a game. A game which entailed a degree of speculation, since newly added stocks were chosen by the S&P on criteria including industry representation, liquidity, ownership concentration, profitability, and others that the S&P saw fit.

Gruel (1986) and Lynch and Mendenhall (1997) both document price reversals following the addition and deletion of a stock to the S&P 500 Index, which they argue supports the price pressure hypothesis. For example, for a sample of 194 newly added and 13 deleted companies, Harris and Gurel (1986) report a positive stock price response of 3.13% and -1.40%, respectively. These announcement period excess returns are reversed for both additions and deletions after the effective day. Dash (2002) lends further credence to the price pressure hypothesis by examining the stock price performance of companies that were removed from the S&P 500 Index when they did not satisfy share price, market capitalization, liquidity, company fundamentals, or other S&P Special Index Committee criteria. For Dash's sample of 53 index deletions, initial price losses from announcement through effective day were recouped by the 60th day after the effective exclusion of the stock. A mean reversion in stock prices due to price pressure effects is consistent with short-term downward sloping demand curves for stocks.

The second group of studies comprises those that report evidence consistence with long-run downward sloping demand curves for stocks. Shleifer (1986), Goetzmann and Garry (1986), Jain (1987), Dhillon and Johnson (1991), Beneish and Whaley (1996), Blouin, Raedy, and Shackelford (2000), Blume and Edelen (2001), Chordia (2001), Wurgler and Zhuravskaya (2002), Elliott and Warr (2003), Hegde and McDermott (2003), and DMOY (2003) all report permanent price effects to S&P 500 Index additions (or deletions). Over various intervals from 1986 through 2002, these studies report a permanent stock price increase ranging between 2.8% to 8.20% to index additions and an average stock price drop of 4.5% to index deletions. Since the vast majority of the studies on S&P 500 Index changes fall into this second group, it would appear that evidence on S&P 500 Index changes favors long-run downward sloping demand curves for stocks.

The third set of studies examines whether announcements of index changes are associated with information effects that might better explain permanent stock price effects to index changes. The leading candidates for information effects embedded in announcements of index changes are a change in expected future earnings (DMOY, 2003), certification by the S&P Special

Committee on the prospects and longevity of stocks selected for addition or deletion (Dhillon and Johnson, 1991; and Jain, 1987), and an adjustment to the required rate of return through a change in long-term liquidity either by an expected change in investor base or shadow cost (Hegde and McDermott, 2003; and CNS, 2004). CNS (2004) conduct a comprehensive examination of 279 S&P 500 Index additions and 145 deletions from 1979 through 2000 and report an asymmetric stock price effect to index additions and deletions. A positive and permanent stock price effect of 6% is observed to index additions but no lasting effect to index deletions. They posit that a change in the required return, as measured by investor awareness and shadow cost, contributes to the asymmetry in long-run stock prices.

Of the fourteen studies since 1986 that examine S&P 500 Index additions, twelve record a permanent positive stock price effect, whilst only one of the six studies on index deletions reports a negative and symmetric stock price effect. The absence of a symmetric effect to S&P 500 Index changes conflicts with evidence that supports both short- and long-run downward sloping demand curves for stocks. The lack of a symmetric effect can best be explained by information effects contained in announcements of index changes in the form of certification, though, the S&P strongly disavows such claims, or that index membership itself conveys information on the prospects of the firm which manifests itself in an adjustment to the required rate of return or a change in future earnings.

To alleviate concerns of index compiler certification, a novel methodology employed by Kaul, Mehrotra and Morck (2000) examines the stock price effect to 31 Canadian stocks that traded on the TSE 350 that increased their weighting in the TSE 350 due to an index weighting reconfiguration. The authors document a permanent stock price effect of 2.3% following the weighting change, which they state is consistent with *long-run* downward sloping demand curves. We believe our study on IBEX 35 Index changes conducted in a certification-free setting complements Kaul, Mehrotra and Morck (2000).

To that end, we conduct event studies on IBEX 35 Index changes to establish whether stock price effects to announcements of index additions and deletions are transitory or

permanent. We then scrutinize permanent stock price effects, if any, to check on whether they can be explained away by actual (and expected) changes in the required rate of return and/or earnings. If our results are consistent with prior U.S. studies on price pressure effects then we should only find a transitory price effect to index changes once we have controlled for changes in expected rates of return and earnings. Whereas, a permanent stock price effect to IBEX 35 Index changes would be consistent with the bulk of evidence on S&P 500 Index changes and support long-run downward sloping demand curves for stocks.

In the next section, we outline our data and sample selection procedure.

II. Sample and Data

We analyze IBEX 35 Index changes from the inception of the index in January 1992 through December 2003. Over this 12-year period, the Madrid Stock Exchange identifies 154 index additions and deletions. We remove 24 index changes from the initial sample since they result from a merger, equity issue, spinoff, or name change of a company. The final sample of 130 index changes comprises 67 additions and 63 deletions. The announcement and effective dates of each index addition and deletion are ascertained from the Madrid Stock Exchange. These dates are corroborated with those reported in *La Gaceta* and *Cinco Dias* newspapers.[3] On average, there are 18 days between the announcement of the IBEX 35 Index change (i.e., the TAC meeting date) to the effective date (i.e., the day on which the index change is implemented).

For the sample of 130 changes eligible for further analysis, daily stock returns, volume turnover, the book value of assets, earnings per share (eps), and net income data are taken from the *Datastream* database over a four-year period centered on the initial announcement of the change. Our measures of stock price performance are daily abnormal returns (AR) and

[3] There were two instances where there was a difference in the reported announcement date between those provided by the Madrid Stock Exchange and those reported in the broadsheet press. In these cases, we decided to use the earliest announcement as our formal announcement date.

cumulative abnormal returns (CAR). AR and CAR are computed over various dates and time intervals (ANN is the announcement date; EFF is the effective date; PRE is the 20-day period preceding the announcement date; and 20POST, 40POST, 60POST, 120POST and 180POST are 20-, 40-, 60-, 120- and 180-day periods following the effective date) using the market model.[4]

Our measures of operating performance are return on assets (ROA) and industry-adjusted return on assets (IAROA). ROA is computed as net income scaled by the beginning of the year book value of total assets. To compute IAROA, we first identify the industry group for each of our index changes and then calculate an average ROA for each industry group. We then subtract the average industry-matched ROA from the ROA of our sample firm, in each year, from the year before through two years after the index change.

For each sample firm, in the year of index change, we also search the I\B\E\S\ database to gather current, one year and two year forward looking analysts' eps forecasts. Of the initial sample of 130 firms announcing index changes, we are unable to gather eps forecast data for 50 firms. We also scan *Bloomberg* and *Reuters* databases to assemble data on the number of shareholders, the number of institutional investors, and the number of large institutional equity holdings over one year before and after the announcement of the index change for each sample firm. Finally, we search the *Securities Data Corporation* (SDC) database for all announcements of new debt and equity financing undertaken by our sample firms from a year before to a year after the announcement of index addition or deletion.

In the next section, we document stock prices and volume turnover to IBEX 35 Index changes.[5] We report results based on ARs and CARs measured relative to the IBEX 35 Index. Changes in trading volume are computed in the spirit of Elliott and Warr (2003). Our measure of volume turnover is trading volume scaled by shares outstanding. We compute turnover in trading volume by scaling event-period by reference-period volume turnover. In this equation,

[4] For completeness, we also compute buy-and-hold AR and CAR for our sample firms over the various dates and intervals.

[5] Because data 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.

the numerator is the volume for additions or deletions scaled by the IBEX 35 Index constituents' volume over the event period, and the denominator is volume over a 30-day pre- or post-announcement reference period standardized by IBEX 35 Index constituents' volume over the same 30-day pre- or post-announcement reference period. The pre-announcement volume turnover is measured from 31 days before through the day prior to the announcement of an index addition or deletion and the post-announcement volume turnover is the 30-day average trading turnover beginning 31 days after the effective date. Thus, trading after the effective date must last for a minimum of 60 days.

III. Event Study, Trading Volume and Long-run Performance

We begin with an event study on the announcements of IBEX 35 Index additions and deletions from 1992 through 2003. To compute ARs we estimate market model parameters for each firm in our sample over the 150-day period beginning 21 days after the announcement date. The ARs are estimated over an event window that spans 20 days before through 20 days after the initial announcement date of the index change. We then present data on changes in trading volume and volume turnover over the same 40-day event window centered on the announcement day.

Table 1 presents the analysis on stock returns, volume and volume turnover.[6] Panel A focuses on index additions and Panel B on index deletions. Several observations on index additions can be drawn from an inspection of ARs and CARs in Panel A. First, the mean announcement day AR of 0.94% (p-value = 0.16) is not significantly different from zero. The announcement of a new entrant to the IBEX 35 does not convey new information. Second, the mean AR of 3.66% (p-value < 0.01) for newly added stocks is statistically significant only on the day on which the stock officially becomes part of the index (i.e., the effective date). This would suggest that investors increase demand in a stock only when it is actually an IBEX 35 constituent

[6] We employ announcement periods of various lengths to determine whether the results of our event study are robust. We also estimate market model parameters over various pre-event intervals. The event study results are robust to the length of announcement period and the interval applied to estimate market model parameters.

and not before. Third, the CAR from announcement through effective day of 2.47% (p-value = 0.02) to index additions is reversed by –3.50% (p-value < 0.01) over a 20-day period after the effective day.

The increase in ARs from the announcement through the effective date for this set of firms is consistent with price pressure effects. The price pressure effects are relieved in the aftermath of index inclusion (Harris and Gurel, 1986; Jain, 1986; Lynch and Mendenhall, 1997). An alternative interpretation that we cannot rule out, for the run-up in price to index inclusion, is that quasi-arbitrageurs enter the market by adding stocks to their portfolios in the hope of turning them around at the effective date at more favorable prices (Benish and Whaley, 1996; and Madhavan and Ming, 2002).

Finally, the volume and volume turnover data to index additions also display a mean reversion pattern that is in line with the AR and CAR results for these sets of firms. For example, trading volume on the announcement and effective day of index additions are 18.9% (p-value = 0.08) and 41.1% (p-value < 0.01), respectively, and the run up in trading volume is 30.5% (p-value = 0.02) from the announcement through the effective date.

Panel B of Table 1 mimics Panel A for index deletions. An inspection of these data reveals three noteworthy observations. First, index deletions are associated with a negative announcement day ARs of –0.85% (p-value = 0.22) which is not statistically significant at conventional levels. Second, a significant average AR of –2.32% (p-value = 0.03) to index exclusion is recorded on the effective day. These observations imply that firms removed from the IBEX 35, on average, lose 3% of their value from the announcement through the effective day, which is fully recouped 20 days after the effective day. As before, we recognize that these patterns are also compatible with index tracking and/or the activities of quasi-arbitrageurs. Third, the data on turnover and trading volume to index deletions are consistent with the drop in stock price from announcement through effective day for these firms. For example, the trading volume on the effective day to index deletions is 3.12 times higher than the average volume over a 20-day period before the announcement day. The difference between the pre-announcement

period and effective day volume is statistically significant at the 0.01 level. Interestingly, the sharp rise in volume from the announcement through the effective day stabilizes by the thirtieth day following the exclusion of the stock from the index.

Up to this point, stock price and volume effects to index changes appear to be short-lived and consistent with short-run downward sloping demand curves for stocks.

Nonetheless, we still have not fully ruled out arguments favoring long-run downward sloping demand curves for stocks. To explore the likelihood of a permanent stock price effect, if any, we examine long-run stock returns and operating performance following announcements of IBEX 35 Index changes and report the results in Table 2. Our analysis on stock returns over 60, 120, and 180 days following the official inclusion (exclusion) of the stock to the index is conducted on both market-adjusted and buy-and-hold returns. To supplement the evidence on stock prices and volume, we also present data on the operating performance of *newly* added and deleted companies. Our measures of operating performance are return on assets (ROA) and industry-adjusted return on assets (IAROA).

Panels A and B of Table 2 present the results on the long-run performance analyses to index additions and deletions, respectively. An inspection of Panel A reveals the absence of a permanent stock price effect to IBEX 35 Index additions. The excess returns (and buy-and-hold returns) for these companies are negative over 60, 120, and 180 days after inclusion to the index. With the exception of the buy-and-hold returns over 60 days after the effective inclusion date, the excess returns in the main are not significant at the 0.10 level or less. These results contrast with the 12 studies on S&P 500 Index additions that report permanent CARs. Our results show that in a setting free of certification (such as that administered by the S&P Committee) there is no permanent stock price effect to index additions. In fact, the positive announcement through effective day excess returns display mean reversion up to 180 trading days after the addition of a stock to the IBEX 35 Index. This leads us to believe that the demand curve for Spanish stocks is downward sloping in the short-run - - which is consistent with evidence presented by Harris and Gurel (1986) and Lynch and Mendenhall (1997) on S&P 500 Index additions.

As a check on our long-run stock price analyses, we also examine long-run operating performance, as measured by ROA and IAROA of companies added to the IBEX 35. The changes in ROA over the year before to the year after and two years after announcement of an index change is 0.978 and 1.375, respectively, and statistically significant at the 0.01 level or less.[7] It would appear that the inclusion of a stock to the IBEX 35 is correlated with an increase in operating performance.

Even so, the documented increase in ROA for newly added firms may be misleading since all firms might have undergone an increase in ROA, thus, what we are observing is a general market phenomenon. To address the impact of economy wide changes, we compute industry-adjusted ROA (IAROA) for each sample firm over one year before through two years after the index change. Once we adjust the ROA for each sample firm by its industry-matched benchmark firm's ROA, the average change in IAROA, for our set of index additions, from one year before to up to two years after the index change is no longer statistically significant at the 0.05 level or less. Interestingly, from one year before to the year after index addition, the IAROA drops by –0.029 (p-value = 0.58). In our analysis of stock price effects and long-run performance, we only find evidence of short-term price pressure effects to IBEX 35 Index additions. In the absence of a permanent stock price effect, we would not expect to find any improvement in the operating performance of newly added companies - - that is the result we observe in Panel A of Table 2 for our sample firms relative to their industry peers.

In Panel B of Table 2, we mimic the analyses in Panel A on our sample of IBEX 35 Index deletions. The long-run returns to index deletions over 60, 120 and 180 days after the effective day are all positive. This result is consistent with Harris and Gurel (1986), Lynch and Mendenhall (1997) and Dash (2003) who report a mean reversion in stock prices following the exclusion of a stock from the S&P 500 Index. Interestingly, the negative announcement through effective exclusion day excess returns rebound permanently after removal from the IBEX 35

[7] The changes in ROA presented in Table 2 appear large in magnitude. However, they are comparable to those documented by Crespi-Cladera and Garcia-Gastona (2000) for large publicly traded Spanish companies.

Index. This rebound in stock prices results in a permanent positive price effect of 2.47% over a 180-day period following the exclusion of these companies from the Index. In summary, we document no lasting stock price effect to IBEX 35 Index additions but there is evidence of a permanent positive price effect to deletions up to 180 days after the removal of the stock from the index.

To complement the long-run price results, we also examine the operating performance of newly deleted companies. We record a significant improvement in ROA for up to two years after index exclusion. The increase in ROA for this set of companies is statistically significant at the 0.05 level or less. However, as before, we also examine IAROA. The results on the changes in IAROA from one year before to up to two years after index deletion are also positive and statistically significant at the 0.05 level or less.

The key result from the event study is that IBEX 35 Index changes are associated with a symmetric short-run price effect that is consistent with existing liquidity hypotheses on index changes (Harris and Gurel, 1986; Lynch and Mendenhall, 1997). There does however appear to be an *anomalous* mean reversion in long-run stock prices following the exclusion of a stock from the index. The increase in stock prices appears to be permanent, and in excess of 2% over a 120-day period after the removal of the stock from the index. Analysis on industry-adjusted operating performance for this set of firms reveals an up-tick in IAROA which might account for the sustained increase in stock price following removal of companies from the IBEX 35. It might be argued that the increase in stock returns and operating performance is due to greater analyst and/or investor scrutiny of managers resulting in a revision in investors' expectations on earnings following index exclusion. To explore this possibility further, in the next section, we examine whether realized earnings and earnings forecasts can justify the lasting stock price effect to IBEX 35 Index deletions.

IV. Realized and Forecast Earnings

The permanent improvement in stock prices to IBEX 35 Index deletions is contemporaneous with an increase in industry-adjusted operating performance. This might manifest in greater inspection by investors and analysts of newly deleted firms. To test this conjuncture, we analyze changes in realized earnings and investors' expectations of future earnings when stocks are added to and deleted from the index. We take data on analysts' earnings forecasts from I\B\E\S as a proxy for investors' expectations of future earnings. In conducting our analysis, we examine the change in average earnings and earnings forecasts from before to after the announcement of index addition or deletion. One caveat with our analysis is that I\B\E\S does not cover all firms in our sample. We are able to gather meaningful forecast data on only 42 additions and 38 deletions. Thus, while we do not place significant emphasis on these results, the results appear to be consistent with those reported in Table 2 on IAROA.[8]

To test whether analysts revise earnings expectations for firms added to and deleted from the IBEX 35 index, we compare the change in eps forecasts for sample firms from before to after the year of index change. From an inspection of realized earnings and eps forecasts surrounding index additions and deletions in Table 3, three noteworthy points emerge. First, index additions and deletions are both associated with a significant increase in eps in the two years after the index change. The average change in eps from before to after the year of deletion is larger in magnitude than to index additions. For example, the change in eps is 0.308 (p-value < 0.01) to deletions and only 0.153 (p-value = 0.05) to additions. These results reaffirm those on IAROA presented in Table 2.

Second, eps forecasts on companies leaving the index (in Panel B) are also larger in magnitude than forecasts on companies added to the index (in Panel A), but not significantly different from one another. For example, in the year of index change, the average eps forecast

[8] We choose to exclude forecasts made by new analysts which might distort our analysis and track forecasts for each continuing analyst for 24 months surrounding the index change announcement. Of the 130 index changes, I\B\E\S does not report earnings estimates for 50 companies. Thus, our sample comprises 80 companies.

for companies removed from the index is 0.434 and 0.407 for companies added to the index. Third, the scaled differences in eps forecasts from before to after index addition, in Panel A of Table 3, are –0.031 (p-value = 0.29) and –0.013 (p-value = 0.60) for the year of addition and year after addition, respectively.[9] In comparison, the scaled differences in eps forecasts from before to after index deletion, in Panel B of Table 3, are 0.054 (p-value = 0.05) and 0.097 (p-value < 0.01) in the year of and in the year after index deletion, respectively. It would seem that analysts revised their eps forecasts downward for newly added firms by 5%, on average, in the year following index membership, while they revised their expectations upward by almost 10%, on average, in the year following index exclusion.

To assess the robustness of the aforementioned results, we also compute standardized revisions in eps forecasts for our two sets of companies. (These results are not formally presented in a table but available from the authors on request.) We standardize the change in eps forecast by the average stock price. Current year standardized forecasts for stocks added to the index are negative (p-value = 0.38). Whilst, standardized forecasts for companies removed from the index are positive and statistically significant at the 0.04 level. Again, these results are consistent with an increase in earnings expectations in the sample of index deletions but no such effect to index additions.

As a final check on our earnings analyses, we also compute earnings forecast errors as the difference between the analysts' median eps forecast and the realized eps for the same financial year with data extracted from I\B\E\S and *Datastream*. The results on changes in eps forecast errors are roughly parallel, albeit larger in magnitude, to those on forecast changes in eps reported in Table 3. For example, the eps forecast change is 5.4% (p-value = 0.04) and the eps forecast error is 18.1% (p-value < 0.01) in the year of index deletion.

[9] To compute the change in forecast, we subtract the mean eps forecast before index change from the average eps forecast after index change for each newly added and deleted company. We then take an average of these differences for our set of newly added companies and examine this against the average of the differences for newly deleted companies.

Apparently, companies removed from the IBEX 35 Index witness increased earnings expectations and better operating performance (as measured by realized eps) relative to their peers who are added to the index. Our earnings analyses reveal that a change in earnings and earnings expectations may be responsible for the permanent positive stock price rebound to index deletions, which is consistent with increased scrutiny placed on managers of newly deleted companies by analysts and investors (DMOY, 2003).

V. Investor Awareness

As noted at the outset, a firm's stock price and operating performance might also increase as a result of increased investors' knowledge and awareness of stocks following index changes. We do acknowledge that it is unlikely that investor knowledge and awareness will increase following the removal of a stock from an index. Nonetheless, for completeness we examine proxies of investor awareness that might elicit changes in the costs of financing. The proxies of awarenedd include: (a) the ability of firms to attract new capital; (b) the production of information demanded by investors, analysts and commentators; and (c) changes in the equity ownership of newly added and deleted companies.

To determine whether index membership influences the ability of firms to attract new capital, we examine debt and equity financing announcements for each firm in our sample for twelve months before and after the announcement of index change. The data on debt and equity announcements for each firm over the 24-month period are extracted from the SDC database. Panel A of Table 4 reports a unit increase (from 7 to 8) in debt financing announcements from before to after index addition. For the same set of firms, equity financing announcements increase from six to seven announcements which represents a 13% increase. In the square brackets we present the average dollar capital raised by our samples of index additions and deletions. All in all, neither the increase in the average dollar level nor the number of announcements of debt or equity is statistically significant at the 0.05 level or less to index deletions.

Changes in the levels of debt and equity financing following index deletions in Panel B of Table 4 are almost symmetric to those documented in Panel A to index additions. For example, there is a unit drop in debt and equity financing announcements following index removal. Examination of the change in the average dollar level of debt and equity in Panel B reports little change in the financing patterns of companies from before to after index exclusion. On the whole, the results fail to report any significant revisions in debt or equity financing following IBEX 35 Index changes. However, due to the small number of debt and equity announcements before and after index changes, we place less emphasis on these results.

To supplement our analysis on the ability of sample firms to attract new capital, we examine whether these companies witness any change in information production following a change in index membership. As might be expected, the absence of a direct measure to assess the production of information poses a significant problem. To remedy this situation, we apply a proxy which assumes that investors' and analysts' needs are reflected in greater information produced by the media. With this assumption in place, we record the number of articles reported in *La Gaceta* and *Cinco Dias* (Spain's two leading business newspapers) over a 24-month period centered on the index change announcement. We report the change in press coverage for index additions in Panel A and index deletions in Panel B of Table 4. In Panel A, the change in press coverage for newly added firms is 9% for articles in *La Gaceta* (from 118 to 129 announcements) and 4% (from 117 to 122 announcements) for articles in *Cinco Dias*. This analysis demonstrates that index additions experience a slight increase in information production as measured by press coverage but the change is not statistically significant at the 0.05 level or less.

Panel B of Table 4 reports the change in press coverage for companies removed from the index. For articles reported in *La Gaceta* there is a 6% reduction (from 107 to 101 news items) and for those in *Cinco Dias* there is a 7% drop (from 104 to 97 news items). Again, neither of the declines in the number of news articles following index deletions is statistically significant at conventional levels. The results in Table 4 show that newly added and deleted firms experience

little, if any, alteration in information asymmetry when proxied by changes in the number of news articles published on these firms in the Spanish press.

As noted above, assessing investor awareness poses numerous difficulties in that there is no direct measure. Hence, in the next section, we supplement our modest analysis of press coverage with additional proxies indicative of investor awareness that includes a change in the number of shareholders, institutional shareholders, and Merton's Shadow Cost from before to after the announcement of index change (CNS, 2004).

Changes in equity ownership from before to after index addition and deletion are also presented in Table 4. If, indeed, newly added companies attract greater investor awareness, then we might expect an increase in the number of shareholders, as they become aware of the stock in the index. Data on equity ownership is obtained in the immediate aftermath of index change and also as late as possible prior to the announcement from *Bloomberg* and *Reuters*.

Panel A of Table 4 reports changes in the number of shareholders and institutional investors who own >5% of the firm's equity for index additions. Panel B mimics Panel A for sample deletions. From an inspection of Panel A, the number of shareholders increased by 7% (p-value = 0.39) from the year before to the year after the announcement of index addition. A much smaller increase of 1% (p-value = 0.78) is observed in institutional blockholders who own >5% of the firm's equity. The average increase in both the number of shareholders and institutional equity holdings following index membership is not significant at conventional levels. In comparison, Panel B of Table 4 reports a slight reduction in the number of shareholders and institutional equity holders to index deletions, which is almost equal in magnitude but opposite in sign to index additions. The results on IBEX 35 Index additions contrast to those reported by CNS (2004), while those on index deletions are comparable to those reported by Pruitt and Wei (1989) and CNS (2004) on S&P 500 Index deletions.

In line with CNS (2004), we expand our analysis of investor awareness to examine Merton's investor recognition hypothesis (1987).[10] If index membership entices investors to hold the stock for its diversification potential then the shadow cost for a company will fall and stock price will rise. However, investors are unlikely to become "unaware" of stocks that are removed from an index thus Merton's model predicts the absence of a negative stock price effect to index deletions.

The measure of shadow cost computed for our sample of index additions and deletions is borrowed from McConnell and Kadlec (1994). We estimate shadow cost by scaling the residual standard deviation on the excess return of each newly added (deleted) stock by the market capitalization of the IBEX 35 Index and then multiplying this term by the market value of the newly added (deleted) firm scaled by the number of shareholders on the announcement date of index change. For both index addition and deletion companies, shadow costs are estimated separately over 12 months before the announcement date and 12 months after the effective date. We refer to the 12 months before the announcement and the 12 months after the effective date as the pre- and post-announcement shadow costs, respectively. The change in shadow cost for our sample companies is the difference between the pre- and post-announcement shadow costs.

Estimates of pre- and post-announcement shadow costs are presented in Panel A of Table 4 for index additions and in Panel B for index deletions. An inspection of Panel A reveals a decrease in the mean shadow cost of –0.024 (from 0.439 to 0.415) for newly added companies. This slight decrease represents a small reduction in segmentation costs, although the p-value for the change is not significant at conventional levels (p-value = 0.39). Similarly, the data on newly deleted companies in Panel B of Table 4 reports little alteration in segmentation costs. The results on shadow cost show that neither index additions nor deletions are associated with any meaningful change in segmentation costs.

[10] In Merton's model of segmented markets for stocks, investors hold only those stocks in their portfolio of which they are aware. Investors will, therefore, hold equity in less than fully diversified portfolios. The difference in the returns expected by less than fully diversified investors will be higher then that demanded by fully diversified investors (estimated by the CAPM). The difference between the returns of the completely and incompletely diversified portfolios is Merton's Shadow Cost.

Taken collectively, the results or lack thereof on changes in investor awareness to IBEX 35 Index changes appear to buttress our earlier findings in favor of short-term downward sloping demand curves for stocks. However, we are still required to address the anomaly of a long-run increase in stock prices and earnings following index deletions.

VI. Multivariate Analysis

The univariate analyses on IBEX 35 Index changes are most consistent with price-pressure effects and short-term downward sloping demand curves for stocks. However, a significant long-run price reversal to index deletions presents a conundrum. To explore the determinants of this jarring price effect further, we estimate OLS regressions using long-run stock returns following the exclusion of a stock from the IBEX 35 Index as the dependent variable. We use long-run returns over 120 after the effective exclusion of the stock as our dependent variable. We then repeat the analysis taking stock returns over 180 days after the effective date. For the independent variables in the OLS regressions, we take changes from the year before to the year after index exclusion in analysts' earnings forecasts, financing, information production and shadow costs, since these variables have been identified in prior literature as leading candidates responsible for permanent price effects to index changes. Though not shown, we also include the average book value of assets to proxy firm size and the geometric growth in sales in the two years prior to the announcement of index change. The OLS results to index deletions are presented in the first two columns of Table 5.

The variable of primary interest to us is the change in eps, which is 6.44 in the first column and 6.81 in the second column and statistically significant at < 0.01 level in both regression models. The positive coefficient on the change in eps (in both columns) suggests that newly deleted companies are expected to perform better in the aftermath of index removal. As noted earlier, it would seem that increased scrutiny is directed at the managers of these companies from investors and analysts alike (DMOY, 2003). None of the remaining independent variables in the first two columns are statistically significant at the 0.10 level or less.

Thus, our multivariate analysis on sample deletions confirms our earlier suspicion that the permanent stock price effect observed for this set of companies can be explained by increased earnings expectations of managers running firms removed from the index.

For completeness and as a check on the results for index deletions, we mimic the analysis for our sample of index additions and report the results in the third and fourth columns of Table 5. In line with the univariate results on index additions, the multivariates reveal that none of the independent variables that proxy a change in either future earnings or the required rate of return is statistically significant at the 0.10 level or less.

These analyses confirm that the lasting price reversal to index deletions is due to an up-tick in earnings following index removal. Once the implied effect of increased earnings on stock prices (i.e., the mean change in eps for this set of firms multiplied by the change in eps coefficient presented in the second column) is stripped away from the permanent stock price effect - - the large positive return of 2.47% observed over 180 days after index removal is reduced to an insignificant 1.81%. It would seem that a simple, albeit logical, explanation can be advanced for the asymmetry in long-run stock price effects to IBEX 35 Index changes. That is, after we control for earnings revisions following IBEX 35 Index deletions, our results in a setting absent certification appear to support the price pressure hypothesis, which causes temporary illiquidity, and favors short-term downward sloping demand curves for stocks.

VII. Robustness Tests

In this section we discuss some of the sensitivity analyses and robustness tests.

A. Short-term liquidity tests

In our analyses, we observe that price pressure effects are the most probable explanation for temporary stock price and volume movements around index additions and deletions. However, we have not yet formally confirmed the presence of price pressure effects and short-term illiquidity in these stocks. To remedy this shortcoming, we apply the Amihud (2002) measure of illiquidity, which takes the average ratio of absolute returns over trading volume measured using

daily data for non-zero volume days over a 60-day period centered on the effective date of an index change. We believe this is an appropriate measure of illiquidity because it can best be described as the lambda from the Kyle (1985) model which captures the price pressure effects of trades.

The results from this analysis reveal that liquidity is constrained over 15 days following the inclusion of a stock to the index and over 29 days after the removal of a stock from the index. Our proxy of price pressure, the ratio of returns to trading volume, resumes stability within four weeks of the effective inclusion and exclusion of stocks to the IBEX 35 Index. These findings reaffirm our initial thoughts in support of the price pressure hypothesis, which in turn is consistent with short-term downward sloping demand curves for stocks.

As a further check on these results, we apply a variant on the Amihud measure that displaces stock turnover for volume in the illiquidity measure equation. The results from these tests are quantitatively similar to those that apply the formal Amihud illiquidity measure.[11]

B. Measures of increased managerial scrutiny

An improvement in earnings following the removal of a firm from the IBEX 35 Index is consistent with increased institutional and analyst scrutiny and pressure directed at the managers of these firms. However, we have not yet established any formal link between superior operating performance and greater scrutiny placed on managers in firms removed from the index. To address this concern, we examine one *well-known* outcome of increased scrutiny - - the rate of turnover in the top management team. To determine the rate of turnover in the top team, we collate board roster information two years before and after the announcement of index deletions for our sample of 63 firms from annual filings held with the Madrid Stock Exchange. We then track all changes in the positions of President or Chairman, Chief Executive Officer and Finance

[11] We recognize that there are at least four possibly better measures of liquidity that employ microstructure data on trades and quotes: (i) the bid-ask spread (Amihud and Mendelsohn, 1986); (ii) the effective bid-ask spread (Chalmers and Kadlec, 1998); (iii) the transaction price impact (Brennan and Subrahmanyam, 1996); and (iv) the probability of information-based trading (Easley, Hvidkjaer and O'Hara, 2002). The unavailability of high frequency data on trades and quotes for our sample firms limits our analysis to the Amihud (2002) measure of daily illiquidity.

Director. This process identifies 13 changes before and 29 changes in the top team after the announcement of an index deletion, which translates into a 25% change in the rate of top management from before to after index exclusion.

Since the premise of this analysis is on turnovers that can be attributed to increased scrutiny and pressure from investors directed at top management, we focus on 'forced' changes in the top team following index deletion. To make this determination, we cross-check each change in top management before and after the deletion of a stock from the IBEX 35 Index with news articles and reports in both *La Gaceta* and *Cinco Dias* to discern the circumstances surrounding each event. All changes in the top team other than retirement were designated as 'non-routine'. Of the 28 'non-routine' changes in the top team, we assign 18 as 'forced'. 'Forced' turnover was determined by scrutinizing news items for one of the following reasons - a firing, poor performance or a disagreement with large stockholders and/or other management that resulted in a senior management change.[12] Of the 18 'forced' changes in the top team, 4 occurred before and 14 after the announcement of index deletion, which translates into a 16% increase in the rate of 'forced' top management turnover which is statistically significant at conventional levels.[13]

As a corollary, we also scrutinized data ascertained from *La Gaceta* and *Cinco Dias* on asset and employee restructuring announcements by sample firms in the two years after the addition or removal of a stock to the IBEX 35 Index. This rather crude examination reveals that the average incidence of asset divestitures and sell-offs was 12% higher and employee downsizing was 8% higher in firms that were deleted from the index vis-à-vis those added to the index.

[12] The definition of 'forced' has been borrowed from Warner, Watts and Wruck (1988), Denis and Denis (1995) and Huson, Malatesta and Parrino (2004), among others, who devote the entirety of their study on top management turnover.

[13] As a check on these results, we also compute the change in the rate of 'forced' turnover in the top management team from before to after the announcement of IBEX 35 Index additions. The rate of 'forced' turnover is almost identical in the year before to after index inclusion. Interestingly, the rate in 'forced' turnover prior to index additions and deletions is indistinguishable, while there is a significant increase in unexpected senior management departures in the aftermath of index deletions.

In sum, this cursory examination reveals increased scrutiny, as measured by a higher rate in 'forced' top management turnover and increased incidence of restructuring, provides a logical explanation for the rise in earnings (and forecast earnings) in the years after firms are removed from the IBEX 35 Index.

VIII. Conclusion

If stocks have perfect substitutes that give rise to horizontal demand curves then any changes in their demand (or supply) absent new information will have little, if any, impact on prevailing stock prices. It has been argued that the effects of changes in the membership of equity index constituent's offers a unique test on whether stocks have downward sloping demand curves. The extant evidence on S&P 500 Index additions reports a permanent positive price effect to such changes, which is consistent with belief that demand curves for stocks are, in the long-run, downward sloping.

The validity of this belief has recently been called into question for a number of reasons. First, if we believe that stocks have long-run downward sloping demand curves, then a symmetric long-run permanent price effect should be observed for both index additions and deletions. Second, this belief is only valid if index compilers do not, maybe unwittingly, certify stocks for inclusion in their index. While the S&P renounces claims of certification on the quality of the stocks added to (or removed from) the S&P 500 Index, it is uncertain whether the S&P conveys information *unknowingly* on firm longevity in its decisions to alter the composition of the S&P 500.

The lack of certification in IBEX 35 Index changes provides the primary impetus for our study. Specifically, it is the automatic selection of stocks based on liquidity that presents a special environment to test whether demand curves for stocks slope downward (in the absence of certification). In this study, we initially document a symmetric announcement effect to IBEX 35 Index changes from 1992 through 2003. There is a short-term increase in stock prices to index

additions and a decrease in prices to deletions. The event study results are consistent with price pressure effects, and short-run downward sloping demand curves for Spanish stocks.

To rule out long-run downward sloping demand curves for Spanish stocks, we scrutinize long-run returns following IBEX 35 Index changes. This analysis reveals a permanent reversion in stock prices to IBEX 35 Index deletions but no lasting effect to additions. At first, it would appear that the asymmetric long-run stock price effects to IBEX 35 Index changes presents a quandary. To address this mystery, we scrutinize several variables that might elicit alteration in future cash flows and/or capital costs that might account for the *permanent* rebound in stock prices to index deletions. The results on these analyses show that a stock's exclusion from the IBEX 35 Index is associated with increased earnings and earnings expectations. Once the impact of the simultaneous earnings effect is stripped away from the stock price effect to index deletions, the remaining residual of the price effect is no longer statistically significant.

In short, our analyses on IBEX 35 Index changes, after adjusting for simultaneous earnings effects, which appear to arise from increased scrutiny placed on management by investors and/or analysts following index removal, are most consistent with liquidity explanations and short-run downward sloping demand curves for stocks.

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Table 1
Stock price response and volume turnover to IBEX 35 Index additions and deletions

The sample consists of 130 changes to the IBEX 35 Index from January 1992 through December 2003. We split the sample of changes into 67 index additions and 63 index deletions. ANN is the announcement day, EFF is the first day on which the index change is effective, and PRE is the 20-day period prior to the announcement day. ANN to EFF represents the period from announcement to the effective day. ANN to EFF+20 represents the period from announcement through 20 days after the effective day (20POST). 60POST refers to the period from announcement through 60 days after the effective day. Abnormal returns (AR) and cumulative abnormal returns (CAR) are computed according to the market model. BHAR represents buy-and-hold returns. Volume turnover is the trading volume scaled by shares outstanding. Turnover in trading volume is computed by scaling event period by reference period volume. * and ** indicate statistical significance at the 0.05 and 0.01 level.

Panel A: IBEX 35 Index additions

Final sample	67	67	67
Stock returns			
	AR	CAR	BHAR
Announcement date (ANN)	0.0094		
Effective date (EFF)	0.0366**		
ANN –20 through ANN –1 (PRE)		-0.0014	0.0019
ANN through EFF		0.0247**	0.0288**
ANN through EFF + 20 (20POST)		-0.0350**	-0.0399**
Stock volume and volume turnover			
	Volume	Volume turnover	
Announcement date (ANN)	0.189*		
Effective date (EFF)	0.410**		
ANN –20 through ANN –1 (PRE)	0.104		
ANN through EFF	0.305**		
ANN through EFF + 20 (20POST)	0.182*		
ANN through EFF + 60 (60POST)	0.108		
ANN / PRE	1.82*	1.77*	
EFF / PRE	3.94**	3.29**	
20POST / PRE	1.75*	1.15	
60POST / PRE	1.04	0.99	

Panel B: IBEX 35 Index deletions

Final sample	63	63	63
Stock returns			
	AR	CAR	BHAR
Announcement date (ANN)	-0.0085		
Effective date (EFF)	-0.0232**		
ANN –20 through ANN –1 (PRE)		-0.0024	-0.0067
ANN through EFF		-0.0291**	-0.0330**
ANN through EFF + 20 (20POST)		0.0302**	0.0288**

Stock volume and volume turnover

	Volume	Volume turnover
Announcement date (ANN)	0.262*	
Effective date (EFF)	0.384**	
ANN –20 through ANN –1 (PRE)	0.123	
ANN through EFF	0.269*	
ANN through EFF + 20 (20POST)	0.164	
ANN through EFF + 60 (60POST)	0.132	
ANN / PRE	2.13*	1.96*
EFF / PRE	3.12**	2.68**
20POST / PRE	1.33	1.26
60POST / PRE	1.07	1.00

Table 2
Long run performance to IBEX 35 Index additions and deletions

The sample consists of 130 changes to the IBEX 35 Index from January 1992 through December 2003. We split the sample of changes into 67 index additions and 63 index deletions. ANN to EFF+60, +120 and +180 represents the period from announcement through 60, 120, and 180 days after the effective day (60POST, 120POST and 180POST). Excess returns (ER) are computed according to the zero one model, where the intercept is 0 and a unitary beta is assumed. BHAR represents buy-and-hold returns. Return on assets (ROA) is net income scaled by the book value of assets. Industry-adjusted return on assets (IAROA) is computed by subtracting the mean industry-matched ROA from the ROA of each sample firm. * and ** indicate statistical significance at the 0.05 and 0.01 level.

Panel A: IBEX 35 Index additions

Final sample	62	62
Long-run stock returns	ER	BHAR
ANN through EFF + 60 (60POST)	-0.0354**	-0.0305**
ANN through EFF + 120 (120POST)	-0.0196	-0.0219
ANN through EFF + 180 (180POST)	-0.0022	-0.0018
Long-run operating performance	ROA	Change in ROA from y-1
ROA in year before change (ROA_{y-1})	1.919	
ROA in year of change (ROA_{y})	2.186	0.267 (13.91%)
ROA in year after change (ROA_{y+1})	2.897	0.978 (50.96%)**
ROA in two years after change (ROA_{y+2})	3.294	1.375 (71.65%)**
Industry-adjusted long-run operating performance	IAROA	Change in IAROA from y-1
IAROA in year before change ($IAROA_{y-1}$)	0.169	
IAROA in year of change ($IAROA_{y}$)	0.140	-0.029 (-17.17%)
IAROA in year after change ($IAROA_{y+1}$)	0.183	0.014 (8.28%)
IAROA in two years after change ($IAROA_{y+2}$)	0.229	0.060 (35.50%)

Panel B: IBEX 35 Index deletions

Final sample	56	56
Long-run stock returns	ER	BHAR
ANN through EFF + 60 (60POST)	0.0345**	0.0339**
ANN through EFF + 120 (120POST)	0.0235*	0.0238*
ANN through EFF + 180 (180POST)	0.0247*	0.0224*
Long-run operating performance	ROA	Change in ROA from y-1
ROA in year before change (ROA_{y-1})	2.173	
ROA in year of change (ROA_{y})	2.859	0.686 (31.57%)*
ROA in year after change (ROA_{y+1})	3.295	1.122 (51.63%)**
ROA in two years after change (ROA_{y+2})	4.389	2.216 (101.98%)**

Industry-adjusted long-run operating performance	IAROA	Change in IAROA from y-1
IAROA in year before change ($IAROA_{y-1}$)	0.198	
IAROA in year of change ($IAROA_{y}$)	0.296	0.098 (49.50%)*
IAROA in year after change ($IAROA_{y+1}$)	0.359	0.161 (81.31%)**
IAROA in two years after change ($IAROA_{y+2}$)	0.408	0.210 (106.06%)**

Table 3
Realized and Forecast EPS to IBEX 35 Index additions and deletions

The sample consists of 130 changes to the IBEX 35 Index from January 1992 through December 2003. We split the sample of changes into 67 index additions and 63 index deletions. Analysts' earnings per share forecasts (eps) are extracted from I\B\E\S. Mean forecasts of eps before the announcement that a company will be added and deleted to the index are compared with eps forecasts following the announcement to compute a change in forecasts. The change in eps forecast is computed for current-year and one year-ahead. FB represents forecast before and FA represents forecasts after the index change. Data on realized eps are taken from Datastream. * and ** indicate statistical significance at the 0.05 and 0.01 level.

Panel A: IBEX 35 Index additions

Final sample	42	42
Forecast EPS before index addition ($)	FB	
Forecast in year of change (FB_y)	0.407	
Forecast in year after change (FB_{y+1})	0.485	
Forecast EPS after index addition ($)	FA	
Forecast in year of change (FA_y)	0.376	
Forecast in year after change (FA_{y+1})	0.472	
Change in forecast EPS from before to after Index Addition ($)		Change in FA from FB
Change in Forecast in year of change (FA_y- FB_y)		-0.031
Change in Forecast in year after change (FA_{y+1}- FB_{y+1})		-0.013
Realized EPS ($)	EPS	Change in EPS from y-1
Earnings in year before change (E_{y-1})	0.273	
Earnings in year of change (E_y)	0.344	0.071 (26.01%)
Earnings in year after change (E_{y+1})	0.426	0.153 (56.04%)*
Earnings in two years after change (E_{y+2})	0.462	0.189 (69.23%)**

Panel B: IBEX 35 Index deletions

Final sample	38	38
Forecast EPS before index deletion ($)	FB	
Forecast in year of change (FB_y)	0.434	
Forecast in year after change (FB_{y+1})	0.526	
Forecast EPS after index deletion ($)	FA	
Forecast in year of change (FA_y)	0.488	
Forecast in year after change (FA_{y+1})	0.623	

Change in forecast EPS from before to after index deletion ($)	Change in FA from FB
Change in Forecast in year of change (FA_y- FB_y)	0.054*
Change in Forecast in year after change (FA_{y+1}- FB_{y+1})	0.097**

Realized EPS ($)	EPS	Change in EPS from y-1
Earnings in year before change (E_{y-1})	0.384	
Earnings in year of change (E_y)	0.536	0.152 (39.58%)
Earnings in year after change (E_{y+1})	0.692	0.308 (80.21%)**
Earnings in two years after change (E_{y+2})	0.760	0.376 (97.92%)**

Table 4
Change in financing, equity ownership, shadow cost and press coverage to IBEX 35 Index additions and deletions

The sample consists of 130 changes to the IBEX 35 Index from January 1992 through December 2003. We split the sample of changes into 67 index additions and 63 index deletions. We collected data on the number of new debt and equity issues from SDC for a 24-month period centered on the announcement of index change. Two popular broadsheets, *La Gaceta* and *Cinco Dias*, were scanned to assess the production of information from before to after index change. We collected data on the number of shareholders, institutional investors, financial institutional investors for each firm from *Reuters* and *Bloomberg*. Shadow cost is computed as the residual standard deviation of the index addition or deletion scaled by the IBEX 35 market value multiplied by the market value of the addition or deletion scaled by their number of shareholders. The number of shareholders is gathered immediately prior and post-index change date. * and ** indicate statistical significance at the 0.05 and 0.01 level.

Panel A: IBEX 35 Index additions

Final sample	54	54	54
	1 year before	1 year after	Change
Financing			
Debt [$ amount]	7 [100329]	8 [104555]	1 [4226]
Equity [$ amount]	6 [194751]	7 [214339]	1 [19588]
Equity ownership			
# Shareholders (millions)	0.87	0.93	0.06 (7%)
# Institutional shareholders (> 5% equity)	3.16	3.20	0.04 (1%)
Merton's Shadow Cost	0.439	0.415	-0.024 (-6%)
Press Coverage			
La Gaceta (news items)	118	129	11 (9%)
Cinco Dias (news items)	117	122	5 (4%)

Panel B: IBEX 35 Index deletions

Final sample	49	49	49
	1 year before	1 year after	Change (%)
Financing			
Debt [$ amount]	7 [87597]	6 [89339]	-1 [1742]
Equity [$ amount]	10 [898022]	9 [877068]	-1 [-20954]
Equity ownership			
# Shareholders (millions)	0.93	0.92	-0.01 (-1%)
# Institutional shareholders (> 5% equity)	3.84	3.58	-0.26 (-7%)

Merton's Shadow Cost	0.396	0.399	0.003 (1%)
Press Coverage			
La Gaceta (news items)	107	101	-6 (-6%)
Cinco Dias (news items)	104	97	-7 (-7%)

Table 5
OLS regressions on IBEX 35 Index additions and deletions

The sample consists of 130 changes to the IBEX 35 Index from January 1992 through December 2003. We split the sample of changes into 67 index additions and 63 index deletions. The dependent variable in the OLS regressions is excess returns computed using the zero one model. In the first and third columns, excess returns are estimated from the announcement through 120 says after the effective day (POST120) and in the second and fourth columns the returns are computed from announcement through 180 days after the effective day (POST180). Analysts' earnings per share forecasts (eps) are extracted from I\B\E\S. Mean forecasts of eps before the announcement that a company will be added and deleted to the index are compared with eps forecasts following the announcement to compute a change in forecasts. The change in eps forecast is computed for current-year and one year-ahead. We collected data on the number of new debt and equity issues from SDC for a 24-month period centered on the announcement of index change. Two broadsheets, *La Gaceta* and *Cinco Dias*, were scanned to assess the production of information from before to after index change. We collected data on the number of shareholders, institutional investors, financial institutional investors for each firm from *Reuters* and *Bloomberg*. Shadow cost is computed as the residual standard deviation of the index addition or deletion scaled by the IBEX 35 market value multiplied by the market value of the addition or deletion scaled by their number of shareholders. The number of shareholders is gathered immediately prior and post-index change date. P-values are reported in parentheses.

	IBEX 35 Index Additions		**IBEX 35 Index Deletions**	
	POST120	POST180	POST120	POST180
Final Sample	42	42	38	38
Intercept	-1.84 (0.20)	-0.20 (0.22)	1.86 (0.00)	1.01 (0.10)
Change in eps	8.96 (0.68)	0.96 (0.71)	6.44 (0.00)	6.81 (0.00)
Change in $ debt	0.00 (0.28)	0.01 (0.21)	0.00 (0.80)	0.00 (0.69)
Change in $ equity	0.00 (0.95)	-0.01 (0.37)	-0.01 (0.11)	-0.01 (0.19)
Change in press coverage	0.04 (0.51)	0.01 (0.70)	0.05 (0.12)	0.04 (0.19)
Change in the number of shareholders	-6.61 (0.19)	-2.74 (0.51)	6.89 (0.15)	5.38 (0.20)
Change in the number of institutional shareholders > 5%	1.71 (0.37)	0.23 (0.31)	-0.23 (0.30)	-0.08 (0.73)
Change in shadow cost	-2.39 (0.24)	-1.89 (0.44)	1.78 (0.39)	0.39 (0.66)
r^2	*0.0916*	*0.1433*	*0.3401*	*0.3619*