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Institutional Ownership and Changes in the S&P 500

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ABSTRACT

Several recent articles have provided new evidence for the existence of price pressures by examining the price and volume effects associated with changes in the S&P 500. The present study extends this work by examining actual changes in institutional holdings following both additions to and deletions from the S&P 500. The results show that changes in institutional holdings in response to additions or deletions from the S&P 500 are positively correlated. In addition to providing further evidence for the existence of price pressure effects, the results also provide evidence of the very large institutional elasticities of demand for stock.

IN TWO RECENT ARTICLES in this journal, Shleifer (1986) and Harris and Gurel (1986) present important new evidence of the existence of price pressures by examining the price and volume effects associated with changes in the composition of the Standard and Poor's (S&P) 500 market index. Specifically, these authors interpret the strong increases in trading volume and economically and statistically significant increases (decreases) in share prices on the first trading day following additions to or deletions from the S&P 500 as the result of increased (decreased) demand by institutional index funds rather than from information effects concerning the future return distributions of the newly listed (delisted) firms. The results of similar price and volume studies conducted by Woolridge and Ghosh (1986) and Lamoureux and Wansley (1987) are also generally consistent with the predictions of the price pressure hypothesis.

While both Schleifer (1986) and Harris and Gurel (1986) suggest that changes in institutional index fund holdings are responsible for the observed abnormal returns in response to S&P 500 changes over the years between 1966 and 1983, their joint failure to examine actual institutional ownership changes following listing or delisting from the index does not allow for direct tests of this possibility. This study presents results of such tests.

I. Data

Institutional ownership holdings for 250 firms added to the S&P 500 index over the years from 1973 to 1986 are obtained from issues of the *Value Line Investment*

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Survey.[1] Only those firms for which data were not reported to or available through *Value Line* are excluded from the analysis. Due to the fact that large changes in institutional ownership are often associated with events such as tender offers or bankruptcies, only the seventeen firms removed from the S&P 500 index for reasons other than bankruptcy, merger, or tender offer are included in the delisting tests.

Since institutional holdings are reported to the SEC only on a quarterly basis, percentage institutional share holdings for the calendar quarters just before ($INST_{i,b}$) and after ($INST_{i,a}$) listing on (delisting from) the S&P 500 are calculated for each firm in the sample:

$$INST_{i,b} = I_{i,b}/T_{i,b} \quad \text{and} \quad INST_{i,a} = I_{i,a}/T_{i,a}, \tag{1}$$

where $I_{i,b}$ and $I_{i,a}$ and $T_{i,b}$ and $T_{i,a}$ are the institutional holdings and total shares outstanding, respectively, before and after addition to (deletion from) the S&P 500 market index.

Differential institutional holdings following listing (delisting), DIF_i, are calculated by subtracting firm i's institutional holdings before listing on (delisting from) the S&P 500 from the institutional holdings following addition (deletion):

$$DIF_i = INST_{i,a} - INST_{i,b}. \tag{2}$$

To control for changes in institutional holdings unrelated to changes in the S&P 500 index, differential institutional holdings for security i, *net* of changes in the level of institutional holdings for a random sample of five Dow Jones 30 firms, $NDIF_i$, are obtained by subtracting the mean percentage change in institutional holdings for the five control firms from the differential institutional holdings for firm i following listing (delisting):[2]

$$NDIF_i = DIF_i - MCDIF, \tag{3}$$

where *MCDIF* is the mean reported percentage change in institutional holdings for the control firms over the same calendar quarters employed in calculating the differential institutional holdings for each of the firms added to or deleted from the S&P 500 market index.

II. Empirical Results

A. Additions to and Deletions from the S&P 500 List

Table I presents a summary of statistical tests of the mean percentage changes in institutional ownership both gross (Panel A) and net (Panel B) of changes in the institutional holdings of the five control firms. The sample consists of the 250 firms added to the S&P 500 index over the years between 1973 and 1986.[3]

[1] *Value Line* obtains its information concerning institutional share holdings from two independent contractors which compile SEC filings, *Viccars Data Services* and *Spectrum Disclosure Service*.

[2] The five control firms employed in the research are Eastman Kodak, Exxon, I.B.M., Minnesota Mining and Manufacturing, and Phillip Morris.

[3] Data for the firms added to (deleted from) the S&P 500 market index list over the years 1973 to 1981 are obtained from Larry Harris.

Table I

Mean Gross and Net Institutional Ownership Changes Following Additions to the S&P 500 Index: 1973–1986

Panel A: Mean Institutional Ownership Changes Gross of Changes in the Control Firms (MDIF)[a]

Time Period	Number of Firms	Mean Institutional Ownership Change (MDIF)	Standard Error	Test Stat. (t)	Number of Firms Registering Increase	Test Stat. (t)
1973–79	117	0.0045	0.0018	2.47	72	2.50
1980–86	133	0.0145	0.0039	3.76	78	1.99
1973–86	250	0.0099	0.0023	4.38	150	3.16

Panel B: Mean Institutional Ownership Changes Net of Changes in the Control Firms (MNDIF)[b]

Time Period	Number of Firms	Mean Institutional Ownership Change (MNDIF)	Standard Error	Test Stat. (t)	Number of Firms Registering Increase	Test Stat. (t)
1973–79	117	−0.0064	0.0032	−2.00	59	0.09
1980–86	133	0.0161	0.0039	4.08	83	2.86
1973–86	250	0.0056	0.0027	2.08	142	2.15

[a] These tests compare the mean change in institutional holdings as reported in *Value Line* for the calendar quarters before and after addition to the S&P 500. (Positive values indicate increases in institutional holdings.)

[b] These tests compare the mean change in institutional holdings as reported in *Value Line*, net of changes in a control group of five Dow Jones 30 firms, for the calendar quarters before and after addition to the S&P 500. (Positive values indicate increases in net institutional holdings.)

Following Shleifer (1986) and Harris and Gurel (1986), results are presented for two equal time intervals (1973 to 1979 and 1980 to 1986) as well as for the entire sample.

The mean percentage gross change in institutional ownership is significantly positive (at the five percent level) in each of the two tested time intervals as well as for the entire sample as a whole.[4] In addition, the mean net change is significantly positive in the second time interval (1980 to 1986) but not the first. This fact suggests that much of the gross increase in institutional holdings over the first time interval was due to an increase in the overall level of institutional holdings rather than an S&P 500 effect.

Although the deletion sample is comprised of only seventeen firms, the results

[4] In addition, in each case, the percentage of firms registering institutional holding increases is also significantly different from the random change probability of 0.5 at the five percent level. The binomial proportionality test statistic is computed as follows:

$$Z = (P_o - 0.5) \cdot (N / 0.25)^{(1/2)},$$

where P_o is the observed proportion of firms with institutional share holding changes greater than zero, and N is the total number of firms in the tested sample.

(Table II) suggest (at the ten percent level) that institutional holdings decrease following deletion from the S&P 500 market index.

The temporal dependency in the institutional ownership results discussed above supports the earlier findings of both Shleifer (1986) and Harris and Gurel (1986). Indeed, these authors report that the temporary rises in share prices observed following additions to the S&P 500 index have steadily increased in magnitude over the years from 1966 to 1983. Thus, our findings augment theirs and suggest that the price fluctuations following changes in the composition of the S&P 500 may indeed be due to changes in security demand by index funds and other large institutional buyers.

B. Abnormal Return Regressions

To further explore the relation between post-listing abnormal returns and institutional ownership changes, a cross-sectional regression of the day 1 post-listing abnormal return and the net change in institutional ownership is performed. The day 1 abnormal returns for each firm (AR_i) are calculated using the same procedures employed by Harris and Gurel. The estimated regression equa-

Table II

Mean Gross and Net Institutional Ownership Changes Following Deletions from the S&P 500 Index: 1973–1986

Panel A: Mean Institutional Ownership Changes Gross of Changes in the Control Firms (MDIF)[a]

Time Period	Number of Firms	Mean Institutional Ownership Change (MDIF)	Standard Error	Test Stat. (t)	Number of Firms Registering Increase	Test Stat. (t)
1973–86	17	−0.0485	0.0341	−1.424	9	0.243

Panel B: Mean Institutional Ownership Changes Net of Changes in the Control Firms (MNDIF)[b]

Time Period	Number of Firms	Mean Institutional Ownership Change (MNDIF)	Standard Error	Test Stat. (t)	Number of Firms Registering Increase	Test Stat. (t)
1973–86	17	−0.0689	0.0356	−1.936	9	0.243

[a] These tests compare the mean change in institutional holdings as reported in *Value Line* for the calendar quarters before and after deletion from the S&P 500. (Negative values indicate decreases in institutional holdings.)

[b] These tests compare the mean change in institutional holdings as reported in *Value Line*, net of changes in a control group of five Dow Jones 30 firms, for the calendar quarters before and after deletion from the S&P 500. (Negative values indicate decreases in net institutional holdings.)

tion is (test statistics in parentheses):[5]

$$AR_t = \underset{(9.88)}{0.88} + \underset{(2.13).}{3.43}\ (NDIF_t)$$

The significant slope estimate further supports the earlier findings of Shleifer (1986) and Harris and Gurel (1986) and is consistent with the hypothesis that price pressure effects resulting from institutional trading are responsible for the abnormal returns observed following changes in the composition of the S&P 500.

III. Summary

This study presents a direct empirical test of Shleifer's and Harris and Gurel's earlier conjecture that institutional buying and selling pressure is responsible for the abnormal returns observed for a security following its initial listing on (delisting from) the Standard and Poor's 500 market index. The results suggest that changes in institutional security holdings and abnormal returns in response to additions to (deletions from) the S&P 500 are indeed positively correlated. This finding is important for two reasons. First, it augments and further supports results and conclusions obtained by both Harris and Gurel (1986) and Shleifer (1986). Second, and perhaps more importantly, it provides evidence of the identity of the providers of liquidity in the stock market. Although the increase in institutional ownership is, as expected, significantly positive following additions to the S&P 500, the overall magnitude of the change (less than two percent) is very small relative to the increase in trading volume observed by Harris and Gurel as well as to the known aggregate dollar value of institutional index funds. Thus, the observed small net change in institutional holdings following listing on the S&P 500 index suggests that the required liquidity resulting from the increased demand by index funds is being supplied by other, non-index institutions.[6] As such, the results provide important new evidence of the very large institutional elasticities of demand for equity securities.

[5] Virtually identical regressions are obtained when gross (as opposed to net) institutional share holdings are employed. The regression remains similarly unchanged when standardized abnormal returns (as opposed to abnormal returns) are employed.

[6] We are grateful to Larry Harris for bringing this argument to our attention.

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