Journal Of Financial And Strategic Decisions
Volume 8 Number 1 Spring 1995

THE PERFORMANCE OF STOCKS: PROFESSIONAL VERSUS DARTBOARD PICKS

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Abstract

This paper evaluates the performance of a portfolio formed on professional advice (also called pros picks) with another portfolio picked at random (also called random or dart picks). We study public announcements of professionals' recommendations and random picks from the "Investment Dartboard" column in the *Wall Street Journal*. Our findings indicate that significant abnormal returns accrue to the investors' of pros picks, on the day of publication and on one day after the publication. The results also indicate that there is no significant stock price behavior pattern prior to the pros recommendation. The holding period is arranged on a continuum ranging from roughly one week to six months and a comparison of the mean excess returns of the two portfolios is made over this range. Results suggest that the pros selection statistically outperforms the random selection only in the one-week period. Over a six-month holding period, the random stocks perform better than the pros recommendations. A publicity effect is discerned from the pros recommendation, which gives support to a moral hazard problem encountered by investment professionals. The results are also consistent with the literature on noise and overreaction.

INTRODUCTION

In an efficient market the prices of securities instantaneously and fully reflect all available information and this preempts investors from earning abnormal returns. In the absence of abnormal returns, investors have no strong incentive to acquire information and a random selection of securities is just as effective as the selection based on extensive security analysis. Therefore the value of information in the form of investment advice has been the subject of discussion and empirical investigation for many years.

Several studies have examined the stock price reaction to announcements of investment advice. Examples of investment advice that have been empirically examined include the low cost financial publications such as the "Heard on the Street" column in the *Wall Street Journal* (see Lloyd-Davies and Canes [21], Liu et.al. [19],[20]); subscription financial newsletters such as the Value Line Investment Survey (see Shelton [24], Hausman [14], Black [2], Holloway [15], Copeland and Mayers [8], Stickel [25], Huberman and Kandel [16], Pawlukiewicz and Preece [22]); brokerage house recommendations (see Bjerring et.al. [4]) and other announcements of credit rating changes by rating agencies (see Ingram et.al. [17], Stickel [26]). These studies generally indicate that security analysts have private information not revealed in stock prices. In other words, investment advice has economic value (at least in the short term), and when revealed, results in statistically reliable price changes. These price changes create an opportunity for arbitrage and as such are considered a violation of market efficiency.

The purpose of this paper is to test whether the market professionals (also called pros), are any better than naive investors when it comes to picking stocks. Here the naive investor is assumed to select stocks at random. We thus contribute to the existing debate concerning the value of investment analysts' advice by comparing the performance of a set of stocks selected on professional advice (also called pros picks) with random picks. We look at the public announcements of pros and random picks from the "Investment Dartboard" (ID) column that appears monthly in the *Wall Street Journal* (*WSJ*). This approach, therefore, enables us to gauge the effect of pros recommendations on firms' stock prices before, during and after the period in which the announcement first appears in the financial press. This is

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important, since any unusual behavior pattern in stock prices prior to the publication might stimulate speculation on part of the professional stock pickers. Also because of the publicity effect, the stocks bought or sold on the advice of professionals might outperform the random portfolio only in the short-run. The investment pros could make use of this publicity phenomenon to their advantage by recommending stocks in which they have a vested interest. Therefore, in recognition of the above problem, we compare the performance of the portfolios by holding them for varying periods ranging from approximately a week to six months. This will provide evidence of whether the effect of recommendations in the long-run is transitory or permanent.

In the following sections the methodology and the data are described. The fourth section analyses the results and presents our findings and interpretations, while the conclusions are made in the last section.

METHODOLOGY

We compare the performance of the pros and the dart picks by examining whether excess returns (or above-market performance) is realized by buying and holding either of the two portfolios for varying periods of time. The portfolios specifically are held for 5, 21, 42, 84 and 125 trading days. These trading days approximately correspond to 1 week, 1 month, 2 months, 4 months and 6 months respectively. We choose a relatively long holding period for two reasons. First, this lets us compare the performance of the two portfolios purged of any publicity effect that may be present in the securities picked by market analysts. Second, this allows us to examine whether the stock price performance of pros picks are transitory. Moreover, as Pound and Zeckhauser [23] posit, investment professionals have long maintained that their strategies are not supposed to "outsmart" the market over the 30-40 day period typically employed in the event study literature, but rather on a longer-term approach. This has been particularly true for those who attempt to identify undervalued firms.

Over the holding periods, we measure the performance of the two portfolios using the cumulative excess returns from the market model (see Brown and Warner [6]).

Equation 1

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}$$

where:

R_{it} = return on the common stock of firm i on day t
R_{mt} = return on the equally weighted CRSP index on day t
α_i, β_i = regression coefficients
e_{it} = error term for firm i on day t

For each sample observation, calendar time is converted to event time by defining the date of publication in the *WSJ* as event day 0. We first estimate the coefficients of the market model for each firm using daily observations of returns for the 250 trading days spanning the period -375 through -126. Days -125 to +125 are set aside as the event window in which short-term as well as long-term abnormal returns are to be studied. For each firm i, prediction errors, PE_{it}, are calculated for each day in the analysis period,

Equation 2

$$PE_{it} = R_{it} - (a_i + b_i R_{mt})$$

where a_i and b_i are estimates of α_i and β_I.

The prediction errors are estimates of the abnormal returns to the stockholders of the sample stocks for each of the trading days surrounding the event day.[1] Average prediction errors, APE_t, across all firms (N_t) in both the portfolios are calculated for each day in the analysis period. These averages are cumulated to provide a series of cumulative average prediction errors (CAPEs) in the analysis period:

Equation 3a

$$APE_t = 1/N_t \sum_{i=1}^{Nt} PE_{it}$$

Equation 3b

$$CAPE_{k1,k2} = \sum_{t=k1}^{k2} APE_t$$

where the k_1 and k_2 denotes the beginning and ending of the relevant period. The corresponding test statistics are given by:

Equation 4a

$$t_{APE_t} = APE_t / S_p$$

Equation 4b

$$t_{CAPE_{k1,k2}} = CAPE_{k1,k2} / [(k_2 - k_1 + 1) \times S_p^2]^{1/2}$$

The time series standard deviation, S_p, is estimated by:

Equation 5

$$S_p = [\sum_{t=-375}^{-126} (APE_t - \overline{APE})^2 / 249]^{1/2}$$

where $\overline{APE}$ is the mean average prediction error for the 250 trading days in the estimation period.

DATA

Investment Dartboard Column (ID)

The "ID" column was created in October 1988 by John R. Dorfman and is henceforth being published in the first half of every month in the *Wall Street Journal*. This column was designed by pitting professional stock pickers against dart throwing amateurs. In this 'game' a quartet of well-regarded investment experts pick their favorite stock to either buy or sell, while four amateurs hurl darts at a list of New York Stock Exchange (NYSE) or Over-the- Counter (OTC) stocks and record the names of the stocks pierced by pure chance. The column then publishes the performance (unadjusted for market risk) of each of the portfolios in the subsequent month. The pros whose selections do best are invited back in the next month for another round of a similar game.

The motive behind initiating this column was to see if the professional investor with all his/her sophistication in the form of superior judgment, information and analysis can outperform the relatively uninformed, naive investor.

Sample

We examined this column on a monthly basis from October 1988 through June 1991. For the stocks to enter into our sample, they had to meet the following criteria:

1. The firms had to be listed on the Center for Research in Security Prices (CRSP) tapes which include all firms listed on the NYSE, American Stock Exchange (AMEX) and NASDAQ market.
2. The stocks must be traded for 375 days prior to and 125 days subsequent to the day of publication.

A total of 132 recommendations were made by the pros during the sample period, of which 114 were buy recommendations.[2] Twelve (12) of these stocks fail to meet the above selection criteria and thus the pros portfolio consists of 120 stocks. The sample of random stocks is also obtained from the "Investment Dartboard Column" in the *Wall Street Journal* and are randomly reduced from 132 stocks to 120 stocks correspondingly.

ANALYSIS OF RESULTS

Short-Term Stock Price Response

Pros Recommendation

In this section, the short-term stock price response surrounding the pros recommendation is examined. The abnormal returns and the associated t-statistics for days -10 through day +10 are presented in Table 1. It can be seen that the abnormal return on the day of announcement is 2.87 percent and is highly significant at any conventional level. The post announcement period provides evidence that day +1 abnormal return is 0.80 percent and is also significant. Other than this, all of the post announcement returns except for day +4 are insignificant. These results are similar to the findings of Liu et.al. [19] in their examination of the stock price reaction to the securities recommendation on the 'Heard on the Street' column of the *Wall Street Journal*.

We also analyze the cumulative prediction errors (CAPE) over a set of different short intervals given by (-1,+1), (-2,+2), (-5,+5), (0,+1), (0,+2), (0,+3), (1,+2) and (1,+5). This is shown in Table 2. The results indicate that the pros picks generate significant abnormal returns over all the short intervals that is inclusive of the event day. The highest statistically significant abnormal return is found during the interval (0,+1) which represents a 3.66 percent abnormal return. Overall, the results support the hypothesis that investors earn positive abnormal returns surrounding the date of the pros recommendation.

Random Picks

Table 1 and Table 2 also present the day -10 through day +10 excess returns and the cumulative excess returns over different short intervals for the random picks. True by nature of the inherent selection process, the results show that the stock prices behave randomly, with none of the returns being significantly abnormal. The interval statistics show no sign of significance. It can be therefore said that the pros portfolio exhibit larger excess returns than the portfolio picked on random by a naive investor in the short-run. But it remains to be seen if the pros can "outsmart" this naive investor over a relatively longer interval.

Response Over Longer Intervals

To determine whether the pros recommendation has a permanent effect on stock returns, longer intervals following the recommendation are examined. The intervals include (0,+21), (0,+42), (0,+84) and (+0,+125). These intervals approximately correspond to 1 month, 2 months, 4 months and 6 months respectively.

As seen in Table 3, the pros portfolio does not generate any significant excess returns for holding periods of one month and two months. Furthermore, it is observed that the excess returns become significantly negative if the portfolio recommended by the pros is held for four and six months. On the other hand, not surprisingly, the portfolio comprised of random picks shows insignificant abnormal holding period returns over all the intervals.

Differences In Market Response

In the previous sections, we report that significantly positive abnormal returns are associated with the pros portfolio in the short-run but not in the long-run. In this section, tests of significance are performed to determine whether there is a difference in the magnitude of the response between the two portfolios in the short- and long-run. This is done by testing the mean difference between the cumulative average prediction error of the two portfolios for each interval. To test the differences in price response over particular intervals, the following test statistic is used:

Equation 6

$$t = CAPE_{1T} - \overline{CAPE}_{2T}) / S_d$$

where $\overline{CAPE}_{1T}$ and $\overline{CAPE}_{2T}$ are the mean cumulative average prediction error (abnormal return) over interval T for the pros and random portfolios respectively; and S_d is an estimate of the standard deviation of the difference appearing in the numerator. S_d is calculated as the square root of the following[3]:

Equation 7

$$S_d^2 = (s_1^2 + s_2^2) / n$$

where n is equal to 120 and is the size of the pros or random portfolio, and s_1^2 and s_2^2 are the variances of the CAPEs for the pros selection and random picks respectively. The test results over various intervals are presented in Table 4. The results presented include tests that are conducted for the intervals (0,+5), (0,+21), (0,+42), (0,+84) and (0,+125). Examination of the results indicate that the mean excess return of the pros portfolio is significantly higher only in the shortest of intervals considered, i.e., (0,+5). This difference in excess returns between the two portfolios then gradually decreases with increasing intervals and ends up being significantly negative. This implies that the random portfolio outperforms the pros portfolio when the holding period is six months.

The implication of these tests are that the pros recommendations, in comparison to the random picks, "pay off" only when the investor buys (or sells) the stock before the pros recommendation becomes public and holds the stock for a very short period. Thus a publicity effect from the recommendation is discerned, which is indicative of a moral hazard problem, in that the pros have an incentive to recommend stocks in which they have a vested interest in. However, this publicity effect does not last long as the positive abnormal performance of the pros picks are found to be transitory.

The results found are also consistent with the overreaction literature (see for example De Bondt and Thaler [9], Brown, Harlow and Tinic [5], Atkins and Dyl [1], Chopra et.al.[7], Liang and Mullineaux [18]). The overreaction hypothesis claims that investors systematically overreact to extreme events and place too much emphasis on relatively recent information. This leads to a correction or a price reversal in stock prices in the post event period. Our findings corroborate this hypothesis, in that the positive stock price reaction to pros recommendation is followed by a gradual reversal in stock prices.

The observed phenomenon, short-term positive reaction and long-term negative reaction, is reminiscent of the noise trading hypothesis proposed by Black [3], De Long et.al. [10], [11] and Froot et.al. [12]. Under this hypothesis, the pricing errors induced by noise trading (i.e. trading by uninformed investors) are eventually reversed. Our results support such a case.

CONCLUSIONS

We examine the value of investment advice given monthly by investment analysts in the "Investment Dartboard Column" of the *Wall Street Journal*. The portfolio thus formed is compared with another portfolio which consists of stocks selected at random. The results indicate that the pros portfolio generates significant positive abnormal return on the day of publication in the *WSJ*. However, upon comparison of this portfolio with the dart portfolio, the pros portfolio outperforms the dart portfolio only when the holding period is one week or less. For holding periods longer than a week, the pros portfolio does not perform better than the portfolio of random picks. The pros portfolio, in fact, generates

significant negative abnormal returns over the longer holding period intervals. Therefore, a profitable opportunity can be realized by going short on the buy recommendation and/or long on the sell recommendation over the six-month investment horizon.

This leads us to believe that the publicity effect, is potent only in the short-term which then lends support to a moral hazard problem encountered by investment professionals. In other words, the effect of the recommendation in the long-run is transitory.

TABLE 1
Average Prediction Error (APE) In Days -10 to +10 Relative To The Day Of Publication In "Investment Dartboard"

	Pros Portfolio (120 Firms)		Dart Portfolio (120 Firms)	
Day	APE_t (%)	t	APE_t (%)	t
-10	0.07	0.30	0.18	0.86
-9	-0.17	-0.71	-0.08	-0.40
-8	0.31	1.26	-0.02	-1.07
-7	-0.06	-0.23	0.03	0.15
-6	-0.45	-1.85	0.13	0.61
-5	-0.16	0.67	-0.01	-0.05
-4	-0.03	-0.14	0.34	1.61
-3	-0.64	-2.62**	0.15	0.73
-2	0.56	2.31*	0.00	0.00
-1	-0.22	-0.52	-0.33	-1.55
0	2.87	11.78**	-0.34	-1.59
+1	0.80	3.26**	0.07	0.35
+2	-0.23	-0.93	0.25	1.16
+3	-0.16	-0.64	0.41	1.93
+4	-0.75	-3.07**	-0.08	-0.36
+5	-0.18	-0.75	-0.07	-0.31
+6	-0.32	-1.30	0.16	0.76
+7	-0.10	-0.44	0.08	0.37
+8	0.05	0.22	0.10	0.46
+9	-0.16	-0.67	-0.09	-0.41
+10	-0.24	-0.97	-0.22	-1.06

*Significant at the 0.05 level. **Significant at the 0.01 level.

TABLE 2
Performance Of Pros Recommendation And Dart Picks Over Short Intervals

Interval	Pros Portfolio CAPE (%)	Pros Portfolio t	Dart Portfolio CAPE (%)	Dart Portfolio t
(-1, +1)	3.44	8.15**	-0.59	-1.61
(-2, +2)	3.77	6.93**	-0.35	-0.73
(-5, +5)	2.18	2.70**	0.40	0.58
(0, +1)	3.66	10.63**	-0.26	-0.88
(0, +2)	3.44	8.14**	-0.02	-0.05
(0, +3)	3.28	6.73**	0.39	0.92
(0, +5)	2.35	3.94**	0.25	0.48
(1, +2)	0.57	1.64	0.32	1.07
(1, +3)	0.41	0.97	0.73	1.98*
(1, +5)	-0.52	-0.96	0.58	1.24

The interval (0, +5) approximately corresponds to a holding period of one week.
*Significant at the 0.05 level. **Significant at the 0.01 level.

TABLE 3
Performance Of Pros Recommendation And Dart Picks Over Longer Intervals

Interval	Pros Portfolio CAPE (%)	Pros Portfolio t	Dart Portfolio CAPE (%)	Dart Portfolio t
(0, +21)	0.89	0.78	0.76	0.77
(0, +42)	-1.51	-0.95	1.51	1.09
(0, +84)	-6.31	-2.81*	-0.96	-0.49
(0, +125)	-9.22	-3.37*	0.12	0.05

*Significant at the 0.05 level. **Significant at the 0.01 level.

TABLE 4
Test Of The Difference In Cumulative Average Prediction Error (CAPE)
Between Pros Recommendation And Dart Picks Over Different Intervals

Interval	CAPE Mean Difference (%)	t
(0, +5)	2.08	2.38*
(0, +21)	0.12	0.08
(0, +42)	-0.03	-1.34
(0, +84)	-5.30	-1.47
(0, +125)	-9.15	-1.97*

*Significant at the 0.05 level. **Significant at the 0.01 level.

ENDNOTES

1. A sell recommendation is the opposite of a buy recommendation and therefore a correction is made for the abnormal returns of such recommendations by multiplying it by -1.

2. The pros bias towards buy recommendations might be due to the fact that analysts are prone to be conservative and are reluctant to report negative information about firms in the "ID" column.

3. The distribution of t depends upon whether the population variances of the CAPEs of the two groups are equal or not. If the variances are equal, the pooled sample variance may be used; the S_d in the test statistic is the square root of the following:

   $$S_d^2 = S^2(1/n_1 + 1/n_2)$$

   where:

   $$S^2 = [S_1^2(n_1 - 1) + S_2^2(n_2 - 1)] / [n_1 + n_2 - 2]$$

   and the distribution is exactly a t-distribution.
   If the variances are unequal; S_d in the test statistic is the square root of the following:

   $$S_d^2 = (s_1^2 / n_1 + s_2^2 / n_2)$$

   and the distribution is approximately a t-distribution (See Freund and Walpole, 1980).
   Since in our study the size of the two portfolios are the same, the two formulas essentially reduce to

   $$S_d^2 = (s_1^2 + s_2^2) / n$$

   where $n_1 = n_2 = n$.

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