

Market Response to Value Line OTC Special Situations Service Recommendations

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Abstract

This study examines both the information content and investment performance of *The Value Line OTC Special Situations Service* (VLSSS) recommendations. The results indicate that the buy and sell recommendations provide significant positive and negative two day abnormal returns, respectively, around the announcement of the recommendation. No evidence is found, however, of positive abnormal investment performance from portfolios selected based on the recommendations.

Introduction

The *Value Line Investment Survey* (VLIS) has been the subject of considerable attention over the years by both investment professionals and academic researchers (e.g., Black, 1973; Copeland and Mayers, 1982; Hausman, 1969; Kaplan and Weil, 1973; Peterson, 1987; Shelton, 1967; Stickel, 1985). The cause of this attention is the *Value Line enigma*—the purported ability first documented by Black (1973) of VLIS-recommended securities to outperform randomly selected portfolios. Subsequent studies have examined two general issues: the information content of VLIS recommendations (Lee, 1987; Peterson, 1987; Stickel, 1985), and the investment performance of portfolios selected on the basis of VLIS recommendations (Copeland and Mayers, 1982; Hall and Tsay, 1988; Holloway, 1981; Huberman and Kandel, 1987; Peterson, 1987).

The information content papers have focused on the market reaction to VLIS ranking changes and initial reviews. For example, Stickel (1985) reports that Value Line rank changes affect common stock prices and that the effect varies by type of rank change and by firm size. Peterson (1987) analyzes daily price reaction to initial reviews by VLIS and concludes that these reviews convey information to the market. The investment performance studies by Holloway (1981) and Copeland and Mayers (1982) extended the work of Black (1973) and show that portfolios formed on the basis of VLIS rankings outperformed benchmark portfolios. Peterson (1987) concludes, however, that the price

adjustment to the new information is completed by the day after the announcement and that no subsequent abnormal returns are available.

The information content and investment performance of VLIS recommendations have been analyzed extensively. An unanswered question remains: Does a Value Line enigma exist for other Value Line services? Although Rogers and Owers (1984) examine the informational content of *The Value Line OTC Special Situations Service* (VLSSS) and find a strong price response to the buy recommendations, the study is limited to American Stock Exchange stocks and does not include over-the-counter stocks. In addition, the study does not address the issue of investment performance. For example, Value Line states that:

919 special situations have been recommended in this service since its beginning 37 years ago ... The average percent appreciation of all 919 recommendations has been 83.7 percent. The concurrent percentage increase in the Dow Jones Industrial Average has been 30.6 percent (VLSSS, May 8, 1988, p. 3).

This statement suggests that a Value Line enigma also may exist for this service. Because there is no overlap with the coverage of the VLIS, an analysis of VLSSS recommendations should provide information about the breadth of any Value Line enigma.

The VLSSS specializes in firms traded on the American Stock Exchange and in the over-the-counter market. Because these firms are smaller and lesser known than the VLIS-rated firms, a buy recommendation by the VLSSS should increase the demand for these firms' shares and reduce the liquidity premium required. Numerous authors (Banz, 1981; Brown, Kleidon, and Marsh, 1983; Keim, 1983; Reinganum, 1981) have documented the existence of a size effect in the market. That is, stocks of small firms earn higher risk-adjusted returns, on average, than do those of large firms. Information deficiency arguments (Arbel, 1985; Barry and Brown, 1984; Merton, 1987) also suggest that neglected and less well-known firms may have high returns relative to traditionally measured levels of risk. Because firms selected by VLSSS are smaller and not as widely followed as those covered by the VLIS, its recommendations may result in larger abnormal returns.

The purpose of this paper is to examine both the information content and investment performance of VLSSS recommendations. The results indicate that the buy and sell recommendations provide significant positive (3.33 percent) and negative (-1.27 percent) two-day abnormal returns, respectively, around the announcement of the recommendation. No evidence is found, however, of positive abnormal investment performance from portfolios selected based on the recommendations of VLSSS. Securities purchased at the beginning of the month

after the buy recommendation and sold at the end of the month of the sell recommendation result in a negative, although not significant, cumulative average prediction error (CAPE). Furthermore, the portfolios of recommended securities generally have lower risk-adjusted returns than the market index. The evidence provides no support for the existence of a Value Line enigma in VLSSS.

Sample Selection and Methodology

Sample Selection Process

Buy and sell recommendations were obtained from VLSSS. The VLSSS is published 24 times a year, on the second and fourth Monday of each month. From its inception in 1951 through December 1986, the VLSSS made 887 buy and sell recommendations.¹ Although most of the recommendations were for common stock, occasionally options or debt issues were recommended. The "Specials Closed Out" section provides a complete history of all buy recommendations that subsequently were followed by a sell recommendation, i.e., closed-out. The "Summary-Index" section of VLSSS lists the buy recommendations that remain open.

Analysis is limited to firms with equity issues recommended between January 1963 and December 1985 that were listed on either the Center for Research in Security Prices (CRSP) University of Chicago NASDAQ or NYSE/AMEX daily returns files. These firms were required to have returns for the event period and for the 150 day estimation period. Firms with missing returns were eliminated. At least 100 of the returns during the estimation period also must be nonzero.² This selection procedure produced a sample of 132 buy and 126 sell recommendations. The sensitivity to the nonzero return criterion was tested by using screens that were both more and less stringent. For example, a more stringent criterion of 125 nonzero returns during the estimation period reduced the sample to 40 buy and 51 sell recommendations. The results of these sensitivity tests are similar to those reported below.

¹ Although the early VLSSS issues occasionally contained more than one recommendation, subsequently only one recommendation is contained in each issue; that is, there are two recommendations per month.

² The CRSP NASDAQ file contains numerous firms that have a substantial number of zero returns. Although the screen is somewhat arbitrary, it allows a sufficient number of firms in the sample and reliable estimates of the market model parameters.

Table 1 contains information on the number of buy and sell recommendations in the sample. These new recommendations are relatively evenly distributed across years and between buys and sells. The number of new buy recommendations ranges from a low of one in four different years to a high of 15 in 1981. Similarly, the new sell recommendations range from a low of zero in four different years to a high of 23 in 1982. These recommendations also are distributed evenly across the months of the year. For the combined 23 year period, the number of buy (sell) recommendations included in the sample ranges from a high of 29 (32) in October (June) to a low of 19 (17) for April (October).

The market value of equity each year for the firms in the sample with buy and sell recommendations and the market value of equity for all firms on the Compustat tape also are provided in Table 1. As expected, the firms recommended by VLSSS have substantially smaller equity values than the firms on Compustat. For example, in 1973 the firms with buy and sell recommendations included in the sample had an average market value of equity of \$13.1 million. The average value of equity for the Compustat firms for 1973 was \$214.6 million. The average market value for all VLSSS-recommended firms was \$56.2 million, compared with \$299.1 million for firms on Compustat.

Measurement of Abnormal Returns

An event study methodology is used to examine the effect of VLSSS buy and sell recommendations on the equity value of the firms recommended. Prediction errors (PE_{it}) are calculated from the market model as follows:

$$(1) \quad PE_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}$$

where:

$\hat{\alpha}_i$ and $\hat{\beta}_i$ = parameter estimates determined by ordinary least squares using 150 daily³ returns for firm i (R_{it}) and the market portfolio (R_{mt}).

For the buy recommendations, the 150 observations are selected for a pre-event period relative to the day of the recommendation, $t = 0$. Observations begin with trading day $t = -200$ and end with day $t = -51$. For the sell recommendations, 150 daily observations are selected for a post-event period beginning with trading day

³Prediction errors also are estimated using 48 monthly returns. More detail on the use of monthly returns is provided later in the paper.

$t = +51$ and ending with day $t = +200$.⁴ The equally weighted CRSP index is used for the market portfolio.

The average prediction error for a specific day t during the period of analysis is calculated as:

$$(2) \text{ APE}_t = \sum_{i=1}^N \text{PE}_{it} / N$$

where:

N = the number of firms in the sample.

To test statistical hypotheses concerning average prediction errors, the prediction errors from equation (1) are standardized by dividing them by the estimated standard errors (S_{it}) given in equation (3).

$$(3) S_{it} = S_i \left[1 + \frac{1}{\text{EP}} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{j=a}^b (R_{mj} - \bar{R}_m)^2} \right]^{1/2}$$

where:

S_i = the root mean square error of the market model; and

$\bar{R}_m$ = the mean market return from the estimation period;

a and b = the beginning and ending days for the estimation period; and

EP = the number of days in the estimation period ($\text{EP} = 150$).

Standardized prediction errors (SPE_{it}) are calculated as shown in equation (4).

$$(4) \text{ SPE}_{it} = \text{PE}_{it} / S_{it}$$

⁴Because all sell recommendations are preceded by a buy recommendation, market model estimates may be biased if an estimation period is used that precedes the sell recommendation but follows the buy recommendation date. Using an estimation period for the sell recommendations that precedes the buy recommendation also could bias the estimates because the average period of time between the buy and sell recommendations for the sample firms is 1,181 calendar days (median = 910 days), with a standard deviation of 879 days and a range of 70 to 4,256 days.

To test hypotheses regarding average prediction errors for day t , the standardized prediction errors are averaged over the firms in the sample to determine the average standardized prediction error (ASPE _{t}). Given multivariate normality of the prediction errors, independence of PE _{it} and PE _{kt} ($i \neq k$), and independence between PE _{iu} and PE _{iv} ($u \neq v$), the following test statistic is asymptotically (unit) normally distributed:

$$(5) \quad Z_t = \sqrt{N} \text{ASPE}_t$$

where:

N = the number of prediction errors.

To investigate abnormal performance over two or more days, CAPEs are calculated as in equation (6):

$$(6) \quad \text{CAPE}_{a,b} = \sum_{t=a}^b \text{APE}_t$$

where:

a and b = beginning and ending days for the interval of interest.

To make inferences regarding the CAPEs, average interval standardized prediction errors (AISPE _{a,b}) are calculated as follows:

$$(7) \quad \text{AISPE}_{a,b} = \frac{1}{N} \sum_{i=1}^N \sum_{t=a}^b \text{SPE}_{it} / \sqrt{b-a+1}$$

Given the statistical assumptions invoked above, the following statistic will be asymptotically (unit) normally distributed

$$(8) \quad Z = \sqrt{N} \text{AISPE}_{a,b}$$

Empirical Results

Information Effects

The impact of the information content of the VLSSS buy and sell recommendations is reflected in the abnormal returns. Table 2 contains the CAPE and Z-value for various intervals for both the buy and sell recommendations. Panel A contains the abnormal returns using daily returns.

For the two-day event period, $t = -1$ to $t = 0$, the CAPE is positive (3.33 percent) and significant ($Z = 10.47$) for the buy recommendations and negative (-1.27 percent) and significant ($Z = -3.02$) for the sell recommendations. The evidence strongly supports the hypothesis that VLSSS buy and sell recommendations contain information that is reflected in share prices at the time of the recommendations.

The CAPE for the buy recommendations for interval $t = -5$ to $t = -2$ also is positive (1.09 percent) and significant ($Z = 2.48$). This evidence suggests that the market may be anticipating the buy recommendations a few days prior to their announcement. Similarly, the sell recommendations have a negative abnormal return for this period (-0.77 percent); however, it is not significant ($Z = -1.06$).

Perhaps more surprising is that the buy recommendations have negative and significant CAPEs for two post-event intervals, $t = +1$ to $t = +5$ (-1.31 percent, $Z = -2.47$) and $t = +6$ to $t = +10$ (-1.47 percent, $Z = -2.62$). Conversely, the sell recommendations have a positive CAPE for $t = +1$ to $t = +5$ (1.33 percent) that is significant ($Z = 2.02$). These short-term post-event price reversals could be explained in the context of price pressure. That is, the VLSSS buy (sell) recommendation may result in a temporary increase (decrease) in share price. In the days following the recommendation, the share price returns to its original level as the impact from the recommendation subsides. The longer-term reversal for $t = +1$ to $t = +50$ for the buy recommendations (-8.38 percent, $Z = -4.73$) is more difficult to explain. The negative abnormal return for the 50 days after the event period, however, is similar in magnitude to the positive abnormal return for the period $t = -50$ to $t = 0$ (6.42 percent). Perhaps investors are slower to reverse the impact of buy recommendations than they are sell recommendations.

Panel B presents the CAPE and Z-values for the buy and sell recommendations using monthly data to examine a longer period.⁵ The prediction error for the buy recommendations for the month of the recommendation ($t = 0$) is 8.5 percent, significant at the .01 level ($Z = 4.58$). The prediction error for the sell recommendations is negative (-3.0 percent) but not significant at the .10 level ($Z = -1.71$). Because the month of the recommendation contains many trading days in addition to those of the two-day

⁵Monthly returns are computed from the daily returns. The monthly holding period return is the product of all the daily holding period returns for the month. The CAPE and Z-value are calculated using the methodology described earlier. The pre- and post-event estimation periods for the buy and sell recommendations consist of the 48 monthly returns relative to the month of the recommendation ($t = 0$): $t = -54$ to $t = -7$ and $t = +7$ to $t = +54$, respectively. The 48 month requirement for the estimation period reduces the sample of buy and sell recommendations to 56 and 75, respectively.

announcement interval, the lower Z-value for the monthly returns compared with daily returns is not surprising.

For the six months prior to the month of the announcement, $t = -6$ to $t = -1$, the CAPE for the buy recommendations is positive (9.0 percent) and significant ($Z = 2.65$), but it is negative (-9.8 percent) and significant ($Z = -2.01$) for the sell recommendations. VLSSS appears to be providing buy recommendations for stocks that have been performing well and sell recommendations for stocks that have been performing poorly. This evidence is consistent with the use of relative strength as a characteristic when determining the recommendations. During the six months subsequent to the recommendation, the sell recommendations continue to have negative abnormal returns (-7.0 percent; $Z = -2.10$), but the buy recommendations also have a negative CAPE (-4.8 percent), although the return is not significantly different from zero ($Z = -0.84$).

Investment Performance

Discussion in the previous section concentrated on the information effect of VLSSS buy and sell recommendations. This section provides an analysis of the investment performance of portfolios selected based on the VLSSS recommendations.

A potential portfolio strategy would be to buy a stock based on the buy recommendation and hold it until a sell recommendation occurs. Using monthly data and the post-event estimation period, abnormal returns are calculated from the buy recommendation through the sell recommendation.⁶ The CAPE and Z-value for the portfolio are presented in Table 3. If the recommendations were purchased at the beginning of the month after the buy recommendation (Buy + 1) and sold at the end of the month of the sell recommendation (Sell), the CAPE is -7.00 percent, although this is not significant at the .10 level ($Z = -1.58$). The absence of a positive abnormal return from this portfolio based on the VLSSS recommendations could result from buying and selling dates considerably after the event date.⁷

⁶As abnormal returns are calculated from the buy through the sell date, only one estimation period can be used for the entire period of analysis.

⁷This strategy employs recommendations from the VLSSS issues published both early and late in the month. Because recommendations from both issues are implemented on the same date, information from the recommendations based on the early VLSSS issue would be considerably older than the information in the later issue. Recommendations received from the early and later VLSSS issues were analyzed separately. The results based on recommendations from the two issues are qualitatively the same.

Other possible buy and sell months also provide little evidence of positive abnormal returns. For example, buying on the buy recommendation month (Buy) and selling on the sell recommendation month (Sell) produces a CAPE of -0.39 percent with a Z-value of -0.29. This result is consistent with the efficient markets hypothesis. An investor with perfect foresight, however, could have purchased the securities at the beginning of the month before the buy recommendation (Buy - 1) and sold them at the end of the month before the sell recommendation (Sell - 1). The CAPE for this investment horizon is a positive 5.83 percent, but it is not significant ($Z = 0.77$). Even with perfect foresight, the monthly returns do not provide a positive and significant abnormal return.⁸

The returns in Table 3 exclude the buy recommendations that have not been closed-out. To include the open as well as the closed-out buy recommendations, Table 4 provides the mean returns, standard deviations, betas, and return-per-unit-of-risk measures for all buy recommendations from 1971-1985. The returns are calculated from the month following the buy recommendation through either the month of the sell recommendation or December 1985 if no sell recommendation was issued.⁹ The 1971-1985 period also is separated into three five-year periods to compare the results over time.

For the entire period, the mean monthly return for the recommended stocks is 1.59 percent with a standard deviation of 8.74 percent and a beta of 1.27. The corresponding values for the CRSP equally weighted index are 1.42 percent, 6.39 percent, and 1.0. The portfolio of recommended stocks has a slightly larger mean return and a higher standard deviation of returns and higher beta. The measures of return per unit of total risk and systematic risk for the recommended stock portfolio are both smaller than that for the CRSP index.¹⁰

The results are similar regardless of the time period analyzed. For all three subperiods the standard deviation and beta are higher for the portfolio based on the recommendations than for the CRSP index. In two of the three subperiods,

⁸As noted by a referee, perhaps the VLSSS report "simply certifies recent market opinion and thus puts closure on speculation."

⁹Of the 398 buy recommendations, 351 had sufficient returns on the CRSP file to be included in the analysis. Because buy and sell recommendations occur each month, the number of stocks in the portfolio varies each month. The average number of stocks in the portfolio is 77, ranging from a low of 26 to a high of 125.

¹⁰Because the sample firms selected from VLSSS have small market values of equity, the Wilshire 5000 equally weighted index also is used as the comparison portfolio. Using the Wilshire 5000 index produces results similar to those for the CRSP index. The mean monthly return for the Wilshire 5000 index is 1.78 percent and the standard deviation is 6.34 percent. The beta for the VLSSS portfolio using the Wilshire 5000 index is 1.29.

the mean return also is lower and, thus, the return per unit of risk is lower. Only for 1976-1980 is the return for the VLSSS portfolio higher than for the CRSP index. After adjusting for risk, however, the recommended stocks' performance is virtually the same as that for the CRSP index.

The previous analysis makes no adjustment for the well-documented seasonal nature of stock returns (e.g., Keim, 1983). As the VLSSS recommendations are predominantly for small stocks, this portfolio may provide the largest returns in January. Table 4 contains the mean monthly returns, standard deviation, and beta using only the January returns and the non-January returns for the portfolio of recommended stocks and for the CRSP index. As expected, the January returns are higher. The CRSP index mean return is higher, however, and the standard deviation and beta are lower than those for the recommended stocks for January. Again, the portfolio of recommended stocks does not outperform the CRSP index.

Summary and Conclusions

Previous research has analyzed VLIS recommendations extensively. This study examines the VLSSS recommendations for information content and investment performance. Similar to the results for the VLIS studies, the VLSSS recommendations contain information that is reflected in share prices at the time of the recommendation. Buy and sell recommendations experience abnormal returns of 3.33 percent and -1.27 percent, respectively, during the two-day interval around the date of the recommendation. Positive abnormal returns are found for the six-month interval before the buy recommendations, but negative abnormal returns exist for the sell recommendations. Apparently VLSSS is making buy recommendations for stocks that have been performing well and sell recommendations for stocks that have been performing poorly.

No evidence of positive abnormal investment performance is found for portfolios based on selections from VLSSS. Abnormal returns for VLSSS-recommended stocks from the month of the buy recommendation through the month of the sell recommendation averaged -0.39 percent. Portfolios of all closed-out and open buy recommendations have return-per-unit-of-risk measures that are similar to those for the CRSP index. Using only January returns does not alter the conclusion that the portfolio of VLSSS recommendations does not outperform the CRSP index.

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Table 1
Number of Sample Firms and Market Value of Equity for
Value Line Special Situations Service Buy and Sell Recommendations

Year	Number of VLSSS Recommendations			Market Value of Equity (\$000,000)	
	Buy	Sell	Total	VLSSS Recommendations	Compustat Firms
1963	3	0	3	\$6.1	\$145.3
1964	3	0	3	11.4	174.6
1965	2	0	2	13.4	199.3
1966	6	3	9	15.5	220.9
1967	6	10	16	44.8	272.1
1968	1	8	9	27.1	263.9
1969	3	6	9	21.5	222.4
1970	1	1	2	27.1	212.1
1971	1	6	7	30.3	240.6
1972	1	6	7	17.6	267.1
1973	2	3	5	13.1	214.6
1974	8	0	8	20.7	148.5
1975	7	2	9	31.1	204.8
1976	9	3	12	25.0	252.9
1977	5	9	14	26.6	242.4
1978	6	18	24	39.6	260.6
1979	6	5	11	56.3	313.5
1980	8	7	15	128.0	407.1
1981	15	6	21	96.0	374.5
1982	13	23	36	200.3	443.0
1983	7	4	11	143.3	538.6
1984	11	3	14	189.2	534.6
1985	8	3	11	<u>109.5</u>	<u>726.9</u>
Total	132	126	258	Average 56.2	299.1

Table 2
Cumulative Average Prediction Errors (CAPE) for
Several Intervals Around the Value Line Special Situations Service
Buy and Sell Recommendation Dates

Interval Relative to Announcement	Buy Recommendation		Sell Recommendation	
Panel A: Daily Abnormal Returns				
Daily Intervals	(N = 132)		(N = 126)	
	CAPE	Z-Value	CAPE	Z-Value
-50 to -2	3.09%	1.93 ^b	2.02%	1.66
-10 to -6	0.04	0.26	-0.30	-0.20
-5 to -2	1.09	2.48 ^a	-0.77	-1.06
-1 to 0	3.33	10.47 ^a	-1.27	-3.02 ^a
+1 to +5	-1.31	-2.47 ^a	1.33	2.02 ^b
+6 to +10	-1.47	-2.62 ^a	-0.50	-1.22
+1 to +50	-8.38	-4.73 ^a	1.21	0.43
Panel B: Monthly Abnormal Returns				
Monthly Intervals	(N = 56)		(N = 75)	
	CAPE	Z-Value	CAPE	Z-Value
-6 to -1	9.0%	2.65 ^a	-9.8%	-2.01 ^b
0	8.5	4.58 ^a	-3.0	-1.71
+1 to +6	-4.8	-0.84	-7.0	-2.10 ^b

^a Significant at the .01 level.

^b Significant at the .05 level.

Table 3
Cumulative Average Prediction Errors (CAPE)
For Monthly Intervals From Buy Recommendation
to Sell Recommendation

Interval Relative to Recommendation Month	CAPE (N = 75)	Z-Value
Buy + 1 to Sell	-7.00%	-1.58
Buy to Sell	-0.39	-0.29
Buy - 1 to Sell - 1	5.83	0.77
Buy + 1 to Sell + 1	-9.20	-1.81
Buy - 1 to Sell	2.86	0.36

Table 4
Mean Monthly Return, Standard Deviation, and Return/Risk Measures for Value Line Special Situations Service Recommended Stocks and CRSP Index

Time Period	VLSSS Recommended Stocks				CRSP Index		
	Mean Return ($\bar{r}_p$)	Standard Deviation (σ_p)	Beta (β_p)	$\bar{r}_p/\sigma_p$	$\bar{r}_p/\beta_p$	Mean Return ($\bar{r}_m$)	Standard Deviation (σ_m)
1/71-12/85	1.59%	8.74%	1.27	0.18	1.25	1.42%	6.39%
1/71-12/75	0.00	9.66	1.18	0.00	0.00	0.31	7.78
1/76-12/80	3.82	8.09	1.22	0.47	3.13	2.48	6.23
1/81-12/85	0.92	7.91	1.53	0.12	0.60	1.48	4.71
January 1/71-12/85	8.35	12.41	1.13	0.67	7.39	8.48	10.06
Non-January 1/71-12/85	0.98	8.11	1.32	0.12	0.74	0.78	5.57