The Value Line Enigma Revisited

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This paper re-examines the Value Line enigma documented in Copeland and Mayers (1982). Copeland and Mayers find that between 1965 and 1978 Value Line timeliness rankings yield statistically significant abnormal returns when evaluated with the market model. We extend this work over the period 1982 to 1995 using both the CAPM and the multi-factor models of Fama and French (1993) and Carhart (1997). We find that the Value Line effect continues to hold. Like Copeland and Mayers, we find that this is a result of the abnormal negative performance of firms that Value Line ranks poorly, not the positive performance of firms it recommends.

Introduction

The Value Line effect is one of the most well-known and longest-standing asset pricing anomalies. Each week, *Value Line Investment Survey* (VL) ranks roughly 1,700 firms based on expected future returns. Firms are ranked from 1 to 5. Rank 1 firms are expected to earn the highest returns over the next 12 months, while rank 5 firms are expected to earn the lowest. Rankings are based on publicly available accounting and earnings information. Empirical research has documented that VL provides valuable information.

VL's success has led to its inclusion as a market anomaly in most standard investment texts. Typical is Jones (1998, p. 273) who states:

> The *Value Line Investment Survey* is the largest and perhaps best-known investment advisory service in the country...The performance of the five rankings categories has been very strong. Several studies of the success of Value Line's rankings have been made. It appears that the rankings, and changes in the rankings, do contain useful information.

VL also maintains an outstanding reputation among practitioners. It is one of six newsletters on the 1999 Forbes/Hulbert Investment Letter Honor Roll. *Hulbert*

0747-5535/99/1600/0039/$2.00

Financial Digest finds that VL is the strongest performer of all newsletters over the period 1980—1993.[1]

Black (1973) conducts the first large scale test of the VL enigma. He finds that VL's rank 1 portfolio earns annual risk-adjusted returns 20 percent greater than the rank 5 portfolio. Copeland and Mayers (1982) extend Black's study through 1978. They find that VL continues to be successful. A 7.07 percent return differential between rank 1 and rank 5 firms is documented with semi-annual portfolios.

The Copeland-Mayers article is the last well-known test of the Value Line anomaly. Since then, VL research has focused on market reaction to new information provided by VL rather than the success of the VL ranking system as an investment strategy. Stickel (1985) studies the effect of rank changes on returns. He finds that rank changes have significant impact on stock prices, thus supporting the notion that VL information elicits market response. Affleck-Graves and Mendenhall (1992) contest this, arguing that the abnormal returns found to surround rank changes are merely the artifact of post-earnings announcement drift.

Recent research, however, finds that VL provides useful information, to which the market responds quickly. Peterson (1995) addresses the issue of whether VL conveys pertinent information or if abnormal returns are the result of post-announcement drift through an examination of the "Stock Highlights" section of VL. Peterson concludes that highlighted stocks earn abnormal returns of 2.42 percent over a three-day announcement period with no correlation between abnormal returns and time lag between the last earnings announcement and VL publication. Even professional investors appear to rely on VL. Peterson and Peterson (1995) find that brokers react to VL's recommendations. Graham (1999) provides evidence that other investment newsletters view VL as the market leader and respond to its recommendations.

This paper re-examines the VL effect using currently popular multifactor models. Prior research into the VL anomaly has relied on the CAPM. Recent asset pricing research has called the usefulness of the CAPM into question. Two dominant return patterns appear to be unexplained by the model. Value stocks (typically defined as those stocks with a low price relative to some measure of accounting value) and momentum stocks (those with high returns in the recent past) have been shown to earn abnormally high returns.[2] These results have led to the derivation of multifactor models that account for the return variation related to these anomalies.

Such models have been shown to explain a variety of anomalies but, despite its notoriety, the VL effect has been overlooked. This is surprising because VL appears to be an ideal anomaly to test against these models. For 35 years VL has been rank-

[1] See Jones (1998) and Gorham (1999).

[2] Fama and French (1992), (1993) and (1996) provide a comprehensive discussion of value-based anomalies. Jegadeesh, and Titman (1993) are the first to document the momentum effect.

ing stocks based on a formula that includes variables related to value and momentum. Factors used in selection include relative price, relative earnings, earnings and price momentum, and earnings surprise. The relationship of these factors with momentum is clear. Relative price adds a value aspect to the selection process. Further, there is evidence that economic state factors do play a role in VL stock selection. Huberman and Kandel (1990) conclude that excess returns earned by the rank 1 portfolio are compensation for systematic risk. They write (p. 208): "Value Line's success in finding state variables, or at least exploiting their existence, is remarkable."

This paper extends the work of Copeland and Mayers to a more recent period: 1982–1995. We find that the VL effect continues to hold when tested against the CAPM. We then test to see whether the multifactor models of Fama and French (1993) and Carhart (1997) can explain the abnormal returns accruing to VL portfolios. Our results indicate that they cannot. We find that VL makes use of momentum in its stock recommendations. Rank 1 (rank 5) firms have a significant positive (negative) loading on the momentum factor. This relationship, however, is unable to adequately explain the VL enigma.

Data

Testing covers the period July 1982 to December 1995. The VL universe consists of roughly 1,700 firms. Testing includes those firms listed on the NYSE, AMEX, or NASDAQ. Further, each firm must appear on CRSP and have ordinary common stock outstanding. On average, 1,491 firms are included in the sample.

Portfolios are constructed using the methodology of Copeland and Mayers (1982). Portfolio formation occurs semi-annually, on January 1 and July 1. With each formation the most recent issue of VL is consulted. Five equally weighted portfolios are formed based on VL timeliness rankings. The portfolios contain all stocks assigned the relevant ranking. Monthly excess returns are calculated for the following six months. These returns are equal to the portfolio's raw return minus the return on a 90-day Treasury bill.

The extreme rankings are of special importance to this paper. For VL's analysis to be useful, its recommended stocks must significantly outperform its least-favored stocks. Portfolio 1 consists of firms that VL expects to earn the highest return over the next 12 months, and portfolio 5 consists of firms that VL expects to earn the lowest return over the next 12 months. VL typically gives 100 firms its highest ranking and another 100 its lowest ranking. Our sample includes an average of 95 rank 1 firms and 93 rank 5 firms.

Value Line Returns

Table 1 presents average monthly excess returns for the five VL portfolios. The data appear to support VL's claim of stock-picking ability. The monotonic return pattern that is observed in Copeland and Mayers (1982) continues in this more recent period. Particularly striking is not the high return on the rank 1 portfolio, but the dismal performance of the rank 5 portfolio. The rank 1 portfolio earns slightly more (0.11 percent) than rank 2 and 0.52 percent more than the rank 4 portfolio. The difference rises to 1.24 percent when compared to portfolio 5. Stocks given the lowest ranking by VL earn the same average return as a 90-day T-bill over this 13-year period.

Table 1—Average Monthly Excess Returns on VL Portfolios (July 1982—December 1995)

On July 1 and January 1 of each year all firms listed in the *Value Line Investment Survey* (VL) are divided into five equally weighted portfolios based on timeliness rankings listed in the most recent issue of VL. Monthly excess returns are calculated for the portfolios over the following six months by subtracting the return on a 90-day T-bill from the raw returns on each portfolio.

Rank 1	1.24
Rank 2	1.13
Rank 3	0.94
Rank 4	0.72
Rank 5	0.00
Rank 1 – 5	1.24
t-statistic	3.81

The magnitude of the VL enigma has not dissipated since Copeland and Mayers. During the period 1965-1978 they observe a six-month compound return differential of 7.07 percent between the rank 1 and 5 portfolios. The difference of 1.24 percent per month found here corresponds to 7.67 percent over a six-month period. The t-statistic related to this difference is 3.81.

Value Line Performance – Abnormal Returns

The CAPM

The first stage of testing explores whether the CAPM results of Black (1973) and Copeland and Mayers (1982) continue to hold. Both authors conclude that VL timeliness rankings contain valuable information when evaluated with the CAPM. The equation used in testing is:

$$(1)\ R_{it} = \alpha_i + \beta_i RMRF_t + e_{it}$$

where:

R_{it} = The excess return on VL portfolio i in month t; and

$RMRF_t$ = The value-weighted return on the universe of VL stocks minus the month t return on a 90-day T-bill.

Table 2 contains the alpha, regression coefficient, and R^2 resulting from each regression. Alpha is the critical statistic because it indicates the abnormal performance associated with each portfolio. Abnormal returns decrease nearly monotonically

Table 2—Regressions of VL Rank Portfolios on the CAPM

Regression: $R_{it} = \alpha_i + \beta_i RMRF_t + e_{it}$

The VL returns described in Table 1 are regressed against the CAPM. RMRF in the value-weighted return on the VL universe of stocks minus the return on a 90-day Treasury bill. Rank 1 through rank 5 corresponds to the VL timeliness ranking of stocks in the portfolios. Rank 1-5 is the return on a zero-cost investment strategy. We construct the portfolio by investing long in the rank 1 portfolio and short in the rank 5 portfolio.

	α	$t(\alpha)$	β	R^2
Rank 1	.03	.15	1.29	.81
Rank 2	.06	.49	1.14	.91
Rank 3	-.02	.17	1.02	.90
Rank 4	-.20	-1.27	.98	.82
Rank 5	-1.07	-3.90	1.15	.67
Rank 1-5	1.11	3.34	.14	.02

from rank 1 through rank 5. All alphas are small and insignificant, however, with the exception of that related to portfolio 5. The decline in raw returns from portfolio 1 through portfolio 4 is explained by the fact that the RMRF coefficient declines steadily from a high of 1.29 for portfolio 1 to 0.98 for portfolio 4.

VL's discriminating ability rests solely on its success in determining which stocks will fare poorly in the upcoming months. The rank 5 portfolio has a market coefficient of 1.15 accompanying its low returns, resulting in an abnormal return of -1.07 percent per month. This is consistent with Copeland and Mayers (1982), who observe that rank 5 is the only portfolio with statistically significant abnormal returns. They find that over a six-month period this portfolio earns a risk-adjusted abnormal return of -3.05 percent.

The return on the rank 1-5 portfolio can be interpreted as the return earned by following a trading strategy of investing long in rank 1 firms and short in rank 5 firms. These returns are regressed against the CAPM to determine whether there is a significant difference between the returns earned by portfolios 1 and 5. We find a difference of 1.11 percent per month corresponding to a t-value of 3.34. Thus, the CAPM only explains 0.13 percent of the 1.24 percent return differential between rank 1 and rank 5.

The Fama and French Three-Factor Model

Recent attacks on the CAPM have led to the use of multifactor models in performance evaluation. The most well known is the three-factor model of Fama and French (FF, 1993). The model captures return deviations related to size and book-to-market equity (B/M). Fama and French (1992) document that high B/M and small firms have historically earned higher returns than low B/M and large firms. Fama and French (1996) find that a three-factor model, including a market variable and factors related to size (SMB) and B/M (HML), fares well in explaining a variety of anomalies, especially those associated with value investing. Fama and French demonstrate that their model explains returns on portfolios sorted on earnings/price, cash flow/price, sales growth, and long-term past returns. The model cannot explain returns on momentum portfolios, leading to Carhart's (1997) four-factor model, which is discussed in the following section.

To the extent that VL uses momentum in stock selection, we would not expect the FF model to account for return variation. As noted previously, however, one of the VL factors is related to relative price. If this leads to the selection of low-priced, value firms, we would expect the VL effect to be dampened by the FF model. The model tested is as follows:

(2) $R_{it} = \alpha_i + b_i RMRF_t + s_i SMB_t + h_i HML_t + e_{it}$

The procedure noted in Fama and French (1993) is used in creating the factors. Annually, at the end of June, VL stocks are sorted by size. Two portfolios, each containing an equal number of firms, are formed: B and S (big and small). Similarly, firms are sorted into three portfolios based on B/M: H, M, and L (high, medium, and low). Firms with negative B/M values are excluded from the sorts.

Six portfolios are created from the intersections of the two size and three B/M groupings: H/B, H/S, M/B, M/S, L/B, and L/S. Monthly value-weighted excess returns are calculated for each group over the next 12 months. Two factors are derived from these returns. HML (high minus low) is the return differential between high B/M and low B/M firms. It is calculated by subtracting the simple average return on the two low B/M portfolios (L/B and L/S) from that of the two high B/M portfolios (H/B and H/S). SMB (small minus big) is computed by subtracting the average return on the three big stock portfolios from the average return on the three small stock portfolios. The third factor, RMRF is the market premium. RM is the value-weighted return on stocks in all six portfolios as well as returns on the stocks with negative B/M values. RF is the one-month return on a 90-day T-bill.

Table 3—Regressions of VL Returns on the Fama and French Three-Factor Model

Regression: $R_{it} = \alpha_i + b_i RMRF_t + s_i SMB_t + h_i HML_t + e_{it}$

Alphas and R^2s resulting from regressions of VL portfolio returns on the Fama and French three-factor pricing model are reported. R_{it} is as described in Table 1. RMRF, SMB, and HML represent factors intended to capture return variation related to the market, size, and book-to-market equity. RMRF is described in Table 2. SMB and HML are created by dividing the VL universe of firms into two size and three B/M portfolios on July 1 of each year. Value-weighted returns are calculated over the subsequent 12 months. SMB is the resulting return differential between small and big firms. HML is the return differential between high B/M and low B/M firms.

	α	$t(\alpha)$	R^2
Rank 1	.29	1.85	.90
Rank 2	.18	2.39	.97
Rank 3	.00	.10	.98
Rank 4	-.21	-2.56	.95
Rank 5	-1.12	-6.10	.86
Rank 1-5	1.41	5.21	.36

Size and B/M values are collected from VL in lieu of Compustat. The decision to use VL as a source of data is based on the assumption that information reported in VL better reflects that available to an ordinary investor than the databases commonly used in research.[3]

The abnormal returns presented in Table 3 indicate that the FF model cannot account for the VL effect. In the context of the CAPM, only the rank 5 portfolio displays a statistically significant abnormal return. We find three statistically significant abnormal returns when applying the FF model. In all three cases the abnormal return is in the direction predicted by VL. Rank 2 firms earn positive abnormal returns of 0.18 percent per month. Conversely the rank 4 and rank 5 portfolios both display negative abnormal returns (–0.21 percent and –1.12 percent).

Use of the FF model leads to an increase in the return differential between the rank 1 and rank 5 portfolios. The alpha associated with rank 1 firms increases from 0.03 to 0.29, and rank 5's alpha decreases from –1.07 to –1.12. Thus, the differential increases from 1.11 to 1.41 with a related t-value of 5.21. Based on this, we conclude that the FF model does not explain the VL results.

To give some insight into these results, Table 4 shows the factor sensitivities resulting from each regression. The rank 5 portfolio has the highest sensitivity to each of the FF factors. Thus, the model produces a relatively high expected return for this portfolio. This, coupled with the extremely low raw return earned by rank 5 firms, leads to the large observed alpha.

Table 4–Fama and French Factor Sensitivities of VL Portfolios

Regression: $R_{it} = \alpha_i + b_i RMRF_t + s_i SMB_t + h_i HML_t + e_{it}$

Slope coefficients and t-values from the regression of returns on VL portfolios against the Fama and French three-factor model are reported.

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 1-5
b	1.12	1.05	.99	.97	1.15	-.02
s	.64	.53	.60	.73	1.12	-.48
h	-.58	-.18	.15	.32	.57	-1.15
t (b)	28.93	55.82	86.09	47.88	25.28	-.33
t (s)	9.70	15.58	28.53	19.83	13.59	-3.94
t (h)	-7.56	-4.97	6.49	7.97	6.40	-8.73

All VL portfolios load positively on the size factor (SMB). The book-to-market factor (HML) loading increases monotonically as VL rankings decrease. VL's recommended stocks (those ranked 1 and 2) have negative coefficients related to HML. The other portfolios have positive coefficients. This pattern makes it unlikely that VL is applying a value strategy in its stock selection process. VL appears to favor

[3]Kern and Morris (1994) also provide evidence that the VL database may be more accurate than Compustat.

low B/M firms over high B/M firms. This is demonstrated in Table 5, which presents the composition of the rank 1 portfolio in terms of B/M and size.

On January 1 and July 1 of each year, the VL universe is divided into B/M and size deciles based on values reported in the most recent issue of VL. Decile 1 consists of the smallest (lowest B/M) firms, and decile 10 consists of the largest (highest B/M) firms. The number of rank 1 firms belonging to each decile is tabulated and reported as a percentage of the total rank 1 population.

VL gives its highest ranking to a relatively small number of value firms. Some 34 percent of rank 1 firms are selected from among stocks in B/M decile 1, and 70 percent belong to deciles 1-3. On the other hand, only 2 percent are selected from portfolios 9 and 10. Size does not seem to be as important a selection variable. Rank 1 firms are fairly evenly divided among the top eight size deciles. VL, however, does avoid very small firms, selecting only 4 percent from decile 1 and 12 percent from the smallest two deciles.

Table 5—VL Rank 1 Portfolio Characteristics

This table reports the book-to-market equity (B/M) and size composition of the VL rank 1 portfolio. Semi-annually, on July 1 and January 1, a portfolio of rank 1 firms is constructed from listings in the most recent issue of VL. On these same dates all stocks listed in VL are separated into B/M and size deciles based on current VL information. The percentage of VL rank 1 stocks in each decile is reported.

Deciles	B/M	Size
1	34%	4%
2	22%	8%
3	14%	10%
4	9%	11%
5	6%	11%
6	5%	10%
7	4%	12%
8	3%	12%
9	1%	11%
10	1%	11%

The Carhart Four-Factor Model

Carhart (1997) adds a momentum factor to the Fama and French three-factor model to capture momentum related return patterns. The model is:

(3) $R_{it} = \alpha_i + b_i RMRF_t + s_i SMB_t + h_i HML_t + m_i MOMF_t + e_{it}$

where:

MOMF = The factor related to momentum.

Consistent with other factors, MOMF is created using data readily available in VL. Each week VL publishes a list of the stocks that have earned both the largest (winners) and smallest (losers) returns over the prior 13-week period. Twice a year, on the same dates the rank portfolios are created, value-weighted portfolios are formed using these lists. We use the returns on these portfolios to develop a zero-cost momentum factor by following a strategy of buying all the winners and short-selling all the losers. This momentum factor has an average monthly return of 1.05 percent, demonstrating that momentum has been a profitable trading strategy among VL firms.

There is reason to believe that Carhart's (1997) four-factor model will provide a better description of VL's return history than the prior two models. VL admittedly uses both earnings and price momentum in its ranking system. Prior VL research provides evidence of this relationship. In fact, Jegadeesh and Titman (1993), who first document the momentum effect, list VL's trading strategy as part of the motivation for their research. Both Copeland and Mayers (1982) and Huberman and Kandel (1990) document that VL rank 1 (rank 5) firms have unusually high (low) returns in the period immediately prior to portfolio formation. Huberman and Kandel find that excess returns peak 13 weeks prior to portfolio formation reaching 1.5 percent per week.

Further, the return patterns we observe with VL rank portfolios mirror in many ways those found by Jegadeesh and Titman (1993 and 2001) with momentum portfolios. Unlike value-based anomalies, which have been shown to be remnants of the January anomaly,[4] neither momentum nor the VL effect appear to be related to this phenomenon. Jegadeesh and Titman (2001) find that recent winners earn 2.51 percent less than losers in January but earn 1.41 percent per month more from February through December. Table 6 shows a similar pattern for VL firms. Rank 5 firms do well in January, earning an average excess return of 3.68 percent versus 2.29 percent for the rank 1 portfolio. In all other months, however, the average excess monthly return to the rank 5 portfolio is -0.32 percent. This compares to a return of 1.15 percent on the rank 1 portfolio. The monthly difference of 1.47 percent corresponds to a t-value of 4.70.

Table 6—VL Returns in January and during the Remainder of the Year

This table reports average monthly excess returns earned by the VL rank 1 and rank 5 portfolios. Returns are reported for the entire period (July 1982 through December 1995) and both inside and outside of January.

	January	Feb. - Dec.	Overall
Rank 1	2.29	1.15	1.24
Rank 5	3.68	-.32	0.00
Rank 1 - 5	-1.40	1.47	1.24
T statistic	-.77	4.70	3.81

Momentum and VL portfolios also behave similarly when tested against the Fama and French model. Jegadeesh and Titman (2001) find that the success of the momentum strategy does not derive from the high returns of the past winners but

[4] See Loughran (1997).

from the low returns of the losers. The winner portfolio is found to have an abnormal return of only 0.30 percent per month, while the loser portfolio has a highly significant abnormal return of -0.99 percent. These returns are close to the abnormal returns of 0.29 percent and −1.12 percent that we calculate for rank 1 and rank 5 portfolios. The low returns earned by recent losers and rank 5 firms are unexplained by the Fama and French model, because both portfolios load heavily on each of the FF factors, which lead the model to predict relatively high returns.

Table 7 presents the results of regressions of the VL portfolios on the Carhart model. VL rank portfolios load on the momentum factor as expected. Rank 1 firms load positively, and rank 5 firms load negatively, demonstrating VL's reliance on momentum in stock selection. Rank 1's positive loading on momentum leads its abnormal return to decrease to an insignificant 0.13 percent per month. Rank 5's negative exposure to the momentum factor, however, cannot account for its extremely low return. Rank 5 has a negative abnormal return of 0.96 percent, corresponding to a t-statistic of -5.36. The rank 1-5 portfolio shows that rank 1 firms outperform rank 5 firms by an average of 1.09 percent per month. Thus, the Carhart four-factor model is unable to explain the VL effect.

Table 7—Regressions of VL Returns on the Carhart Four-Factor Model

Regression: $R_{it} = \alpha_i + b_i RMRF_t + s_i SMB_t + h_i HML_t + m_i MOMF_t + e_{it}$

VL returns are regressed against Carhart's four-factor model. RMRF, SMB, and HML are described in Table 4. MOMF is a factor meant to capture return variation related to momentum. It is the return on a zero-cost portfolio created by buying recent winners and selling recent losers. Winners and losers are defined as those firms listed in the most recent issue of VL as having the highest and lowest returns over the prior 13-week period..

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 1-5
α	.13	.11	-.01	-.18	-.96	1.09
b	1.14	1.06	.99	.97	1.13	.02
s	.71	.57	.61	.72	1.06	-.94
h	-.47	-.14	.16	.30	.47	-.35
M	.12	.06	.01	-.02	-.12	.24
t (α)	.87	1.49	-.31	-2.14	-5.36	4.34
t (b)	31.38	59.55	86.47	47.7	25.89	.29
t (s)	10.51	17.17	28.58	19.22	13.16	-7.54
t (h)	-6.35	-3.73	6.81	7.19	5.27	-3.10
t (m)	4.96	4.68	1.90	-1.77	-4.08	5.87
R^2	.92	.97	.98	.95	.87	.48

Conclusion

This extension of Copeland and Mayers' (1982) study confirms that the Value Line effect continues to exist through 1995. Returns on VL portfolios decrease monotonically from rank 1 through rank 5. The average monthly excess return on the rank 1 portfolio is 1.24 percent greater than that on the rank 5 portfolio. Testing supports previous findings that the CAPM is unable to satisfactorily explain the VL effect. Consistent with Copeland and Mayers (1982), we find that this is due to VL's ability to identify poor performing firms rather than its ability to pick winners.

Testing using the Fama and French (1993) three-factor model results in positive abnormal returns for rank 1 and 2 portfolios and abnormal negative returns for rank 4 and 5 portfolios. The difference in excess returns between the rank 1 and rank 5 portfolios is 1.41 percent per month, indicating that the model cannot account for the VL effect.

Finally, we test the VL effect using Carhart's four-factor model, which adds a momentum factor to the Fama and French model. Regression results are consistent with VL's use of momentum in stock selection. Rank 1 (rank 5) firms have a strong positive (negative) relationship with the momentum factor. The model is unable, however, to adequately capture VL's return variation. The return differential between the rank 1 and rank 5 portfolios is 1.09 percent, corresponding to a t-statistic of 4.34. Thus, VL stock rankings remain an enigma.

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