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An examination of Value Line's long-term projections

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Abstract

Unlike previous papers, which have focused on the timeliness ranks, we examine Value Line's 3–5 year projections for stock returns, earnings, sales and related measures. We find that Value Line's stock return and earnings forecasts exhibit large positive bias, although their sales predictions do not. For stock returns, Value Line's projections lack predictive power; for other variables predictive power may exist to some degree. Our findings suggest the spectacular past performance of the timeliness indicator reflects either close alignment with other known anomalies or data mining, and that investors and researchers should use Value Line's long-term projections with caution.

JEL classification: G11; G12; G14

Keywords: Value Line; Long-term projections; Analyst forecasts; Cost-of-capital

1. Introduction

The Value Line Investment Survey follows approximately 1600 stocks. It has been continuously published for many decades and is widely used by investors. Value Line publishes a timeliness rank that forecasts stock price performance over the following 6–12 months. The performance of this indicator has been the focus of dozens of published articles beginning with Shelton (1967). Other notable studies include Kaplan and Weil (1973), Holloway (1981), Stickel (1985), Huberman and Kandel (1987, 1990), Affleck-Graves and Mendenhall (1992) and Choi (2000). The consensus of these and other studies is that after controlling for systematic risk factors, Value Line timeliness ranks have substantial predictive power for future short-term stock returns. Although it is true that much of the abnormal returns occur shortly after *changes* in the timeliness ranking, and it is not clear that one can "beat the market" once transactions costs are taken into account, Value Line's record is impressive. As Choi (2000) notes, it has captured the imagination of the finance community like few others.

In addition to its timeliness rank, Value Line publishes a large amount of information in its quarterly stock reports that may be useful to investors. In particular, once every quarter, for each stock, Value Line reports 3–5 year projections for annual total return, sales per share, earnings per share, dividends per share and historical data for these measures.[1] Unlike virtually all previous studies, which focus on the timeliness ranks, our study concentrates on Value Line's long-term projections. In the spirit of past studies using timeliness ranks, we examine whether Value Line's 3–5 year projections for common stock returns, earnings, sales, profit margins or earnings yields have *predictive power* with regard to realized values over that horizon, e.g. whether purchasing stocks with higher predicted returns would really enable investors to earn higher realized returns, or if firms with higher predicted growth in earnings per share actually do exhibit higher earnings growth ex-post than firms with lower predicted growth.

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[1] Current Value Line reports for each of the 30 stocks comprising the Dow Jones Industrial Average can be freely accessed even by non-subscribers at http://www.valueline.com. A brief perusal reveals the enormous range of information these reports contain beyond the timeliness rank that has been the focus of most prior studies.

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Furthermore, because many previous studies of analyst forecasts have focused on forecast bias, we also examine whether Value Line's 3–5 year projections exhibit significant bias, i.e. whether mean predicted values for stock returns, earnings, etc. differ from mean realized values.

Beyond the fact that Value Line's long-term projections have received little past scrutiny, our study is motivated by three broader considerations. First, while at least dozens of studies have examined various aspects of analysts' short-term (under one year horizon) earnings and stock price forecasts, surprisingly little research has been conducted concerning longer horizon projections. La Porta (1996) sorts stocks into portfolios based on analysts' five-year earnings projections. He finds that stocks with low expected earnings growth earn considerably higher returns, ex-post, than those with high expected growth, partly because analysts subsequently revise earnings forecasts upward for stocks with low expected earnings growth (and vice-versa). Dechow and Sloan (1997) find that analysts' five-year earnings projections are biased upward in general, and that stock prices appear to naively reflect these biased forecasts.[2] Our study, which uses a long sample period and examines the record of an independent advisory service, may shed further light on whether (and if so, why) analyst forecasts are biased.

The second motivation for our study arises from the extensive debate about *why* Value Line's record has been so impressive when compared with those of other security analysts. Several recent studies, notably Desai and Jain (1995), Barber et al. (2001, 2003) have examined security analyst recommendations, and report some evidence that purchasing stocks with the most favorable consensus recommendations (and/or selling short stocks with the least favorable ratings) yield abnormal returns. However, these returns are generally not as large as has been documented for portfolios constructed from Value Line rankings, and the performance of the analysts varies greatly over time (for example, relative to the market as a whole, their buy recommendations performed extremely poorly in 2000 and 2001, while their sell recommendations handily outperformed the market). One possible reason Value Line's record stands out is that Value Line, being an independent subscription service, is not beholden to the firms whose stocks it covers. In contrast, most analysts are employed by investment banks that are dependent on client firms for business. These analysts are notoriously reluctant to issue sell recommendations, and their buy recommendations may depend more on self-interest than on objective analysis of a firm's prospects. Moreover, as Bradshaw et al. (2006) show, analysts' overoptimism is systematically related to corporate financing activities: overoptimism is greatest for firms issuing securities and smallest for firms repurchasing securities. However, an alternative possible reason for Value Line's superior record that has been suggested by many (see for example, Gregory, 1983) is that this record is a product of luck. If a large number of independent advisory services exist and Value Line is the only one that has managed to outperform the market substantially ex-post, then this finding is unsurprising in a statistical sense and does not necessarily imply that markets are inefficient. Finally, some studies suggest that Value Line's timeliness rankings are highly correlated with other known anomalies such as post-earnings announcement drift (Affleck-Graves and Mendenhall, 1992) and that Value Line's record is an artifact of this alignment.[3] By examining Value Line's long-term return predictions, we believe we can contribute towards a resolution of this debate. If it turns out that Value Line's long-term predictions perform as well as their short-term predictions, this would support the argument that Value Line's forecasts are inherently of high quality. Conversely, finding that Value Line's long-term prediction record is not good would suggest that the performance of its timeliness ranks might be a product of data mining or alignment with other anomalies.

The third important motivation for our study is that Value Line's 3–5 year return projections have been extensively used to estimate the cost of equity capital, and to test asset pricing models in ex-ante (rather than the traditional ex-post) form. The performance of these projections is therefore an important issue in its own right. Botosan (1997), Botosan and Plumlee (2002, 2005) and Francis et al. (2004) have all used Value Line 3–5 year projected stock returns as proxies for the cost of equity capital. Ang and Peterson (1985) use ex-ante data from Value Line to investigate the relation between expected stock returns and dividend yield. Similarly, in an interesting recent paper, Brav et al. (2005) use Value Line 3–5 year predicted returns as a proxy for consensus expected returns. Unlike prior studies (e.g. Fama and French, 1992) using realized returns, Brav, Lehavy and Michaely find a robust positive relation between Value Line's expected returns and market

[2] Among studies investigating short-term analyst forecasts, results regarding bias vary depending on the time period and variable examined; for example, Brown et al. (1985), along with O'Brien (1988) find no compelling evidence of bias in security analyst earnings forecasts over their 1976–1980 and 1975–1981 (respectively) sample periods, while Butler and Lang (1991) show analysts were sharply overoptimistic in predicting earnings between 1983 and 1986, and Easterwood and Nutt (1999) report similar evidence for the period 1982–1995. More recently, Agrawal and Chen (2005) find little evidence of systematic bias in earnings forecasts between 1994 and 2003, but Bradshaw and Brown (2005) document substantial overoptimism in 12-month horizon target stock price predictions over their 1997–2002 sample period, and Asquith et al. (2005) find that the probability of achieving a 12-month price target is inversely related to the favorability of an analyst's recommendation.

[3] Some studies have claimed, however, that information contained in Value Line reports can move the market in ways that cannot be completely explained by post-earnings announcement drift. For example, Peterson (1987) documents that initial reviews of stocks in Value Line generate abnormal returns around a three-day window surrounding publication; Peterson (1995) shows that post-earnings announcement drift does not fully explain abnormal returns around publication of stock highlights in Value Line.

beta, a negative relation between expected return and firm size, and no significant relation between expected return and book-to-market. However, none of these studies explores the relation between Value Line's predictions and future realized returns. The sharp disparity in results obtained when the cost of capital is estimated using Value Line predicted returns vis-à-vis other approaches, and when asset pricing models are tested with these predicted returns instead of realized returns, both underscore the need to examine how Value Line predicted returns and realized returns are related.

The balance of this paper is organized as follows. In Section 2, we describe the two datasets we construct from the Value Line surveys and the Center for Research in Security Prices (CRSP) database in order to examine how well Value Line's 3–5 year forecasts predict subsequently realized values. Descriptions of our basic empirical tests and results are provided in Section 3, while robustness tests are reported in Section 4. Section 5 concludes the paper.

2. Dataset construction

The study uses data collected from the Value Line Investment Survey once every four years beginning in the third quarter of 1969 and ending with the third quarter of 1997. The publication dates of the Value Line surveys we sample are between July 1 and September 30 of 1969, 1973, 1977, 1981, 1985, 1989, 1993 and 1997. For each of these periods we collect data for the 65 Stocks included in the Dow Jones Indexes at that time (30 Industrials, 20 Transports and 15 Utilities), providing us (potentially) with 520 pairs of predicted and realized values for each of the variables we study. We thus focus on eight non-overlapping, approximately four-year periods for the following: common stock return (r48), percent change in split-adjusted earnings per share (PCEPS), percent change in split-adjusted sales per share (PCSPS), change in profit margin (DPM), and change in earnings yield (DEY).[4] In order to construct both predicted and realized values for these variables, and to provide us with necessary controls, for each firm-year we collect the following information from Value Line: current stock price and estimated book value per share, number of common shares outstanding, low and high 3–5 year predicted target prices, Value Line's estimated beta, (split-adjusted) sales, earnings and dividends per share for each firm for the eighth, fourth and first years prior to the publication year, and Value Line's sales, earnings and dividends per share forecasts for the publication year and for 3–5 years in the future.[5]

We interpret Value Line's 3–5 year horizon projections as 4-year predictions. This interpretation is merely an approximation. For example, a Value Line report dated August 15, 1997 will contain a high and low projected stock price for the 2000–2002 period. To estimate the "4-year horizon" predicted annual return, we first compute a dividend growth rate as $g = (\mathrm{DIV}_{2000-2002}/\mathrm{DIV}_{1997})^{.25} - 1$, where DIV is Value Line's predicted dividend per share. Next, we project yearly cash flows over a four year period by assuming the estimated publication year dividend grows at the rate of g each year, and by assuming the stock is sold at the average of the high and low target prices taken from Value Line.[6] Finally, we define the Value Line predicted annual return ($\mathrm{VLR48}_t$) as the internal rate of return earned by buying the stock at the "recent stock price" recorded in the Value Line survey and by receiving the cash flows constructed in the previous step. The reason the presumed 4-year forecast horizon is only approximate is that the midpoint of the 2000–2002 range is June 30, 2001; if the report containing the projection is dated August 15, 1997 then in this case the actual forecast horizon would be only 3 years and 10.5 months. This degree of shortfall would be fairly typical, given that the Value Line reports we sample are all dated between July 1 and September 30. Similar considerations prevail regarding the horizons of the sales, earnings, profit margin and earnings yield forecasts of companies that report results for calendar years. For financial statement-based variables, the horizon discrepancies may be greater in the case of a minority of firms whose fiscal years do not coincide with calendar years.[7]

From CRSP, we match monthly realized returns for up to 48 months prior, and 48 months subsequent to the last trading day of September for each firm and publication year in the study to the Value Line data. There were relatively few instances where we could not obtain at least a four-year returns history for the stocks in this dataset. More frequently, however, due to mergers and the occasional bankruptcy, we could not obtain post-forecast returns from CRSP for a full 4-year period. Because we wished to avoid selection bias, we retained such stocks in the study. The CRSP returns we used included partial month delisting returns; in subsequent months, when we could not obtain a return from CRSP, we substituted the CRSP value-weighted portfolio return for the missing return on the individual stock. For each stock, the actual realized return is defined as

[4] Here and throughout the study a "pc" prefix in a variable name indicates a percentage change, and a "d" prefix a first difference.

[5] Value Line does not provide annual forecasts of sales, earnings and dividends per share; rather, a single point forecast is provided for 3–5 years in the future. For example, in a Value Line Investment Survey stock report from the third quarter of 1997, figures are provided for 1997, 1998 and 2000–2002. As explained below, we would interpret the 2000–2002 projection in this case as a 4-year horizon forecast.

[6] Our use of the average of the high and low prices as an implicit point forecast for the future stock price is consistent with Value Line's (2000, p. 24) definition of the target price range. The guide explicitly states that "the midpoint of the range is our estimate of the average annual price three to five-years from now".

[7] Stock return forecasts are not affected if fiscal and calendar years differ, because dividend and target stock price projections in Value Line are always for calendar years. In addition, as explained below, we obtain realized values for sales and earnings from future issues of Value Line, insuring that even when the true horizon differs from 4 years, the horizons are always the same for predicted and actual values.

$$R48_{it,t+48} = \left[\prod_{k=1}^{48}(1 + r_{it+k})\right]^{.25} - 1, \tag{1}$$

where $R48_{it,t+48}$ is the annual average realized return on stock i from the end of publication month t to month $t+48$, and r_{it+k} is the actual return on stock i in month $t+k$.[8]

Financial statement data presents several distinct challenges not encountered with stock returns. Value Line reports historical and projected earnings per share before extraordinary items; nevertheless, earnings are sometimes negative, and a percent change can be calculated only if EPS is positive in the base year. We cannot use an annual growth rate in earnings because such a calculation would further require that EPS be positive at the horizon date (thus forcing us to drop observations where this criterion is not met). Furthermore, no proxy for actual earnings can be obtained for firms that do not survive four years after the forecast date (due to either merger or bankruptcy). Finally, unlike stock prices, earnings are available only with a considerable lag. Consequently, during the July–September period each year when EPS data is obtained from Value Line, only the previous year's actual earnings are known.

In light of these difficulties, we focus on the total percent change in earnings over an approximate 4-year horizon. Value Line's predicted percent change in earnings per share is defined as

$$\mathrm{VLPCEPS}_{i,t+4} = \frac{(\mathrm{VLEPS}_{i,t+4} - \mathrm{EPS}_{i,t-1})}{\mathrm{EPS}_{i,t-1}}, \tag{2}$$

where $\mathrm{VLEPS}_{i,t+4}$ is Value Line's predicted EPS for 3–5 calendar years after the publication date for firm i, and $\mathrm{EPS}_{i,t-1}$ is the EPS for firm i in year $t-1$ (the latest known annual EPS at the time the Value Line report is published). We construct a matching actual total percent change in earnings per share as

$$\mathrm{PCEPS}_{it,t+4} = \left(\frac{\mathrm{EPS}_{i,t+3}+\mathrm{EPS}_{i,t+4}+\mathrm{EPS}_{i,t+5}}{3} - \mathrm{EPS}_{i,t-1}\right)\Big/\mathrm{EPS}_{i,t-1}, \tag{3}$$

where $\mathrm{EPS}_{i,t+n}$ is the split-adjusted EPS for firm i in year $t+n$, as reported in Value Line six years after the year in which the forecasted earnings were obtained. We use an average of earnings per share in years $t+3$ to $t+5$ to reduce cyclical fluctuations and to match Value Line's stated 3–5 year forecast horizon.[9]

The predicted and actual percent change in sales per share are calculated similarly to their earnings counterparts. We define profit margin (PM) as the (Value Line definitions of) earnings per share divided by sales per share. We then calculate the predicted and actual change in profit margin as

$$\mathrm{VLDPM}_{it,t+4} = \mathrm{VLPM}_{i,t+4} - PM_{i,t-1}$$

$$\mathrm{DPM}_{it,t+4} = \left(\frac{PM_{i,t+3} + PM_{i,t+4} + PM_{i,t+5}}{3}\right) - PM_{i,t-1}, \tag{4}$$

where $\mathrm{VLPM}_{it,t+4}$ is Value line's predicted profit margin for firm i 3–5 years after the publication year, and PM for years t + 3 through t + 5 are taken from future issues of Value Line. Predicted and actual changes in the earnings yield, respectively, are calculated as

$$\mathrm{VLDEY}_{it,t+4} = \mathrm{VLEY}_{i,t+4} - \mathrm{EY}_{i,t} \quad \text{and}$$

$$\mathrm{DEY}_{it,t+4} = \left(\frac{\mathrm{EY}_{i,t+3} + \mathrm{EY}_{i,t+4} + \mathrm{EY}_{i,t+5}}{3}\right) - \mathrm{EY}_{i,t}, \tag{5}$$

where $\mathrm{EY}_{i,t}$ is the forecasted EPS for the publication year divided by the current stock price as reported in Value Line, $\mathrm{VLEY}_{i,t+4}$ is the forecast EPS for 3–5 years after publication divided by the average of the high and low predicted 3–5 year horizon stock prices, and $\mathrm{EY}_{i,t+n}$ is the actual EPS for firm i, year n as reported in future issues of Value Line divided by the average annual stock price as reported by CRSP.[10]

Although useful, the Dow dataset has one substantial limitation. Because all of the Dow stocks are large and actively traded, with extensive analyst following, investors would incur relatively lower transactions costs in trading them, and the pricing of these stocks may be more efficient than the typical stock that Value Line follows. To ensure that at least those findings in our study pertaining to stock returns are not primarily driven by the subset of stocks we analyze, we construct a second dataset. Each week, Value Line publishes a summary that contains a table of the top 100 stocks ranked by appreciation potential over a 3–5 year horizon. We sample this table every four years on the final week of September starting in 1969 and ending in 1997. From the table, we obtain the recent stock price, predicted total appreciation, and Value Line's timeliness and safety ranks, and we match return data from CRSP for up to 48 months prior, and 48 months subsequent to the last trading day of September.[11]

[8] In constructing the realized return, the publication month is considered to be September even if the actual stock report from which we obtained data from Value Line was published in July or August.

[9] Following some previous studies, we also calculate an alternative definition of earnings, DEPSP, defined as the split-adjusted change in EPS (average of years $t+3$ to $t+5$ minus year $t-1$) divided by the initial stock price at the time the EPS forecast is made. Results for this alternative definition are reported in a separate robustness section.

[10] For a small number of firms, we were able to obtain financial statement information for four (but not five) post-publication years. In these cases, rather than drop the observations from the sample, we used only the fourth post-publication year (rather than an average of years $t+3$ to $t+5$) in calculating actual earnings, sales, etc.

[11] As before, when we could not obtain post-publication returns for a stock from CRSP for a full 4-year period, we include partial month delisting returns. However, unlike in the case of the Dow dataset, because we perform only portfolio tests for these top 100 firms, we substitute the average of the remaining firms' returns for the missing firm's returns in subsequent months. Otherwise, we construct average annual realized returns in this dataset in exactly the same way as for the Dow stocks.

Table 1
Descriptive Statistics

Variable	Number of observations	Mean	Standard deviation	Minimum	$P = .05$	$P = .25$	Median	$P = .75$	$P = .95$	Maximum
Value line four-year horizon predictions										
VLR48	519	20.26	10.95	−16.06	5.79	12.88	18.66	26.35	39.68	102.47
VLPCEPS	434	98.78	214.30	−25.93	15.71	35.26	59.66	92.07	214.50	2703.03
VLDEPSP	453	8.36	11.24	−5.00	1.58	3.43	5.27	8.34	30.69	118.65
VLPCSPS	451	45.27	34.97	−65.74	9.47	26.04	39.78	56.80	100.39	398.69
VLDPM	451	1.22	2.39	−6.81	−1.55	0.02	0.69	1.85	5.70	17.05
VLDEY	449	−1.54	7.95	−90.42	−9.18	−3.95	−1.28	1.06	5.95	61.17
Realized values over four-year horizons										
R48	519	10.17	14.29	−51.78	−13.41	2.15	10.55	18.70	32.94	57.57
PCEPS	434	31.46	197.39	−545.07	−145.07	−9.24	24.47	70.90	144.06	3122.22
DEPSP	453	1.50	16.54	−120.78	−16.98	−0.67	2.10	5.91	16.59	146.27
PCSPS	451	43.14	58.08	−63.71	−31.47	10.30	37.12	65.03	127.79	626.34
DPM	451	−0.83	4.07	−18.31	−7.57	−2.56	−0.58	1.06	5.22	24.56
DEY	449	−4.85	30.21	−415.65	−21.95	−4.03	−0.76	2.37	7.84	38.08
Risk factors and other control variables										
RMC	519	1.00	1.69	0.01	0.04	0.20	0.38	0.88	4.12	12.37
BM	519	0.91	0.62	−2.77	0.20	0.52	0.78	1.14	2.15	3.80
PR48	511	10.41	12.94	−27.64	−9.22	1.87	10.06	18.10	32.31	57.57
BETA	514	1.00	0.27	0.32	0.63	0.80	1.00	1.15	1.44	2.46
VLFU	454	1.00	0.31	0.35	0.55	0.77	0.96	1.22	1.52	2.06

Variables are defined as follows (a "VL" prefix indicates an ex-ante 4-year horizon value line forecast): R48 = average annual realized stock return over subsequent 48 months, PCEPS = % change in EPS, DEPSP = change in EPS as a percent of the initial stock price, PCSPS = % change in sales per share, DPM = change in profit margin, DEY = change in earnings yield, RMC = relative market capitalization, BM = ratio of book value to market value of common stock, PR48 = average annual common stock return over prior 48 months, BETA = stock's beta as reported in Value Line, VLFU = Value Line forecast uncertainty as computed from width of high–low target stock price range.

3. Tests for unbiasedness and predictive power of value line forecasts

Descriptive statistics for predicted and actual (realized) values for the Dow dataset are reported in Table 1, wherein we report the number of observations, means, standard deviations and various points along the distribution. In the table, we report similar statistics for control variables used in our study. For ease of exposition, we multiply most variables by 100, i.e. we report percentages as whole numbers. We were forced to drop one observation from the sample for predicted and realized stock returns (Penn Central in 1973, for which Value Line did not supply target stock prices), leaving us 519 matching paired observations for VLR48 and R48. For other variables, as explained previously, more observations had to be dropped (this was particularly true in the case of VLPCEPS and PCEPS, where EPS in year $t-1$ had to be positive for the figures to be meaningful); consequently, for financial statement-based variables, number of observations ranges from 434 for PCEPS to 453 for DEPSP. Apart from the large differences in means between many of the Value Line predictions and their matching realized values, examined in much greater depth in Table 2 below, the most striking aspects of the distributions in Table 1 are the extreme values observed for some variables. For example, while the mean for PCEPS (total percent change in earnings over an approximately 4-year horizon) is 31.46, the minimum is −545.07 and the maximum 3122.22.[12] This aspect of the distributions cautions us to test whether our major findings still hold if extreme values are removed, which we do in a separate robustness section below.

Formal tests of Value Line forecast bias are reported in Table 2. Mean predicted and subsequently realized four-year horizon stock returns, broken down by cohort year, are reported in Panel A. These results show that Value Line's analysts have been incredibly overoptimistic in predicting future returns for the Dow stocks in our sample period, insofar as the mean predicted annual return (20.255%) has been almost twice the mean realized return (10.173%), with a t-statistic for the difference in means of 12.966. Indeed, in six of the eight cohort years, the mean predicted return greatly exceeds the mean realized return, and t-tests reject the equality of the two measures at better than 1%.

Evidence concerning the unbiasedness of Value Line's earnings, sales, profit margin and earnings yield forecasts is provided in Panels B through E of Table 2. The EPS and profit margin projections are strikingly overoptimistic on average. The null hypothesis that predicted and actual values overall are equal is rejected at any conventional level

[12] Because PCEPS measures the total percent change in EPS, and EPS can be negative, it is possible for PCEPS to be less than −100%. For example, if a firm has an EPS of $1 in year $t-1$, and average EPS for years $t+3$ to $t+5$ were −$2, then PCEPS would equal −300%.

Table 2
Tests for value line forecast bias

Panel A: Annualized common stock return, month (t) to month ($t + 48$)

Cohort year	Number of observations	Mean VLR48	Mean R48	Mean prediction – actual	t-Statistic
1969	65	19.389	3.049	16.341	9.454***
1973	64	24.730	6.184	18.545	10.776***
1977	65	28.307	7.539	20.769	10.473***
1981	65	32.141	19.232	12.909	5.072***
1985	65	18.682	19.323	−0.641	−0.375
1989	65	15.638	8.423	7.216	3.119***
1993	65	13.526	17.829	−4.303	−2.643**
1997	65	9.697	−0.257	9.955	5.644***
Overall	519	20.255	10.173	10.083	12.966***

Panel B: Total percent change in earnings per share, year ($t - 1$) to year ($t + 4$)

Cohort year	Number of observations	Mean VLPCEPS	Mean PCEPS	Mean prediction – actual	t-Statistic
1969	61	71.613	27.914	43.700	2.943***
1973	62	114.106	82.063	32.043	2.167**
1977	62	81.527	2.227	79.300	3.263***
1981	53	147.851	20.587	127.264	3.095***
1985	49	61.779	18.945	42.834	3.573***
1989	57	72.215	−11.741	83.956	6.380***
1993	41	158.072	155.085	2.986	0.117
1997	49	100.261	−20.070	120.331	4.059***
Overall	434	98.781	31.461	67.320	8.025***

Panel C: Total percent change in sales per share, year ($t - 1$) to year ($t + 4$)

Cohort year	Number of observations	Mean VLPCSPS	Mean PCSPS	Mean prediction – actual	t-Statistic
1969	62	35.090	55.569	−20.478	−3.450***
1973	63	47.159	85.427	−38.269	−3.301***
1977	63	48.636	56.409	−7.773	−1.550
1981	56	57.096	7.431	49.665	9.980***
1985	52	42.168	35.015	7.152	0.952
1989	57	47.991	25.292	22.700	4.935***
1993	49	39.406	23.808	15.598	3.655***
1997	49	43.855	45.510	−1.655	−0.169
Overall	451	45.269	43.140	2.129	0.753

Panel D: Total change in profit margin, year ($t - 1$) to year ($t + 4$)

Cohort year	Number of observations	Mean VLDPM	Mean DPM	Mean prediction – actual	t-Statistic
1969	62	1.353	−1.782	3.135	7.066***
1973	63	0.911	−1.285	2.195	6.265***
1977	63	0.542	−1.802	2.344	4.380***
1981	56	0.773	0.163	0.610	1.118
1985	52	1.098	−0.298	1.395	2.597**
1989	57	0.915	−1.524	2.439	5.604***
1993	49	3.123	2.728	0.395	0.870
1997	49	1.439	−2.277	3.716	6.484***
Overall	451	1.223	−0.834	2.057	11.595***

Panel E: Total change in earnings yield, year ($t - 1$) to year ($t + 4$)

Cohort year	Number of observations	Mean VLDEY	Mean DEY	Mean prediction – actual	t-Statistic
1969	62	−1.047	−5.088	4.042	0.595
1973	63	−3.952	2.276	−6.228	−7.880***
1977	62	−5.886	−13.712	7.826	1.242
1981	54	−5.636	−7.415	1.779	1.228
1985	52	−0.068	−4.243	4.175	2.555**
1989	57	0.870	−6.555	7.425	3.501***
1993	50	3.711	1.515	2.196	5.405***
1997	49	1.202	−4.787	5.988	2.221**
Overall	449	−1.543	−4.846	3.303	2.401**

Notes: Within each panel, the mean Value Line prediction is provided in column 3, the mean of the subsequently realized values in column 4 and the mean difference between the predicted and realized values in column 5. The t-statistic in column 6 is for the two-tailed test that the mean of the predicted minus actual values equals zero. See Table 1 for further variable definitions. *, ** and ***, respectively, indicate significance at the 10%, 5% and 1% levels.

for these variables. Indeed, for both EPS in Panel B and profit margin in Panel D, predicted values are larger than realized values *for every single cohort year*, and the forecast error is significantly positive in a large majority of cohort years. In sharp contrast, Value Line appears to be considerably less biased when predicting sales or earnings yields. For sales overall, we cannot reject the null that the predicted and actual values are equal. In the case of earnings yields, Value Line's analysts have actually been slightly too *pessimistic*, as the mean predicted decline in EY has been significantly smaller (at the 5% level) than the mean actual decline. As EY is simply the reciprocal of the P/E ratio, this indicates stock valuations have risen relative to earnings more than Value Line predicted.[13]

Taking a bottom-up view, the overall tenor of the results in Table 2 strongly indicates that the key variable is profit margin. Because Value Line's analysts consistently overpredict the profit margin, their earnings forecasts also tend to be too high despite the fact that their sales forecasts appear unbiased. The grossly inflated earnings forecasts, in turn, produce inflated stock return predictions despite the apparent pessimism with regard to valuations. If one takes a top-down view, however, Value Line's overoptimism with respect to future returns is difficult to understand, because the ex-post performance of the stock market as a whole over the period 1969–2001, and the performance of the Dow stocks, has not been out of line when compared with longer historical periods.[14] Finally, we note that mean VL predicted returns for the Dow stocks are very similar to mean VL predicted returns on a much broader cross-section of stocks, as can be seen by closely comparing our results in Table 2, by cohort year, to those in Francis et al. (2004, Table 2). Thus, it is unlikely that Value Line's overoptimism is confined to the Dow stocks.

We next examine whether Value Line's long-term forecasts of stock returns, earnings, sales, profit margins and earnings yields have power to predict realized values of these variables in a cross-sectional sense, e.g. do firms for which Value Line predicts relatively greater stock returns actually perform better than firms for which Value Line predicts lower returns? To examine predictive power, we begin by modeling the simple relation between predicted and realized values in a regression framework. While our dataset is primarily cross-sectional, it does have a subtle time series component, and Value Line's long-term forecasts might therefore conceivably have power to predict realized values in two ways. First, as already shown in Table 2 Panel A, Value Line's aggregate predicted return for the "market" (as proxied by the Dow stocks) is time-varying. Similarly, predicted aggregate changes in earnings, profit margins and earnings yields vary substantially based on the cohort year, and might forecast subsequent aggregate realized values. Second, Value Line's analysts might have purely cross-sectional predictive power, i.e. they may successfully predict which stocks will outperform others over a given time period, or which firms will experience rapid earnings growth relative to other firms. Because time-varying market expected returns are generally considered consistent with efficiency, our primary interest lies in the second, purely cross-sectional component of Value Line's predictive power.

We examine the relations between predicted and realized values both with and without controlling for the time series component using the following regressions:

$$\text{Realized value} = \alpha + \beta(\text{VL Prediction}) + e_{it}, \tag{6}$$

$$\begin{aligned}\text{Realized value} = {} & \alpha_1\text{D69} + \alpha_2\text{D73} + \alpha_3\text{D77} + \alpha_4\text{D81} \\ & + \alpha_5\text{D85} + \alpha_6\text{D89} + \alpha_7\text{D93} \\ & + \alpha_8\text{D}\,m97 + \beta(\text{VL Prediction}) + e_{it},\end{aligned} \tag{7}$$

where D69...D97 are 0,1 dummy variables representing the cohort year of the Value Line forecast. Here and in other regression tests in the study, we use the White (1980) correction to ensure that our estimated coefficient standard errors are robust to heteroskedasticity in the residuals.[15] We interpret the slope coefficient from model (6) as a measure of the total predictive power of the Value Line forecasts, and the coefficient β from regression (7) as measuring only the cross-sectional component of Value Line's predictive ability. If these coefficients are significantly positive, then the Value Line forecasts can be interpreted as having predictive power.

The results from estimating models (6) and (7) are provided in Table 3, Panels A and B, respectively. As one

[13] Like their sales projections, Value Line's economic projections do not appear to have been systematically biased for the most part. Every issue of Value Line contains a statement of the hypothesized economic environment 3–5 years in the future, with detailed annual projections for nominal and real GDP, industrial production and a few other variables. We collected these "forecasts" (Value Line does not formally characterize them as such) every four years and compared them with actual realizations for the annual percent change in real GDP, industrial production and the GDP deflator. These results (not reported) showed that while Value Line's economic predictions are often wide of the mark, there generally is no strong bias in these predictions on average. The mean predicted annual growth in real GDP was 3.42%, which is only slightly above mean actual growth of 3.22%. Similarly, the mean predicted inflation rate (4.10%) was only slightly below the mean actual inflation rate (4.44%). The only economic variable for which Value Line appears to have been systematically overoptimistic is industrial production: here Value Line's mean annual growth prediction overall (4.26%) was well above actual growth (2.80%), and the predicted growth rate exceeded the actual for seven of the eight 4-year periods we examined.

[14] Between September 1969 and September 2001, the geometric mean annual return on an equally weighted portfolio of the 65 Dow stocks was about 9.9% in nominal terms, or 5.3% in real terms using the GDP deflator to measure inflation. Over the same period, the CRSP value-weighted NYSE/AMEX/NASDAQ portfolio returned 11.1% per annum in nominal terms and 6.4% in real terms. Both of these measures are roughly in accord with geometric average long-run returns for US stocks reported in Siegel (1998), which are 8.4% per annum in nominal terms (7.0% in real terms) over the 1802–1997 period.

[15] Our error terms are not serially correlated given the largely cross-sectional nature of the dataset, and the fact that we do not use overlapping data.

Table 3
Tests for cross-sectional predictive power

Coefficient	Model estimated for:				
	Stock return	%CH in EPS	%CH in sales per share	Change in profit margin	Change in earnings yield
Panel A: Realized value = $\alpha + \beta$ (VL Prediction) + e_{it}					
α	9.304	−26.986	24.697	−1.700	−3.305
	(6.321)***	(−1.546)	(5.365)***	(−8.832)***	(−2.516)**
β	0.0429	0.5917	0.4074	0.7084	0.9984
	(0.630)	(2.652)***	(5.067)***	(5.671)***	(3.516)***
Test: $\beta = 1$, χ^2	197.78***	3.35*	54.31***	5.45**	0.00
R^2	0.0011	0.4126	0.0602	0.1726	0.0691
Number of observations	519	434	451	451	449
Panel B: Realized value = $\alpha_1 D69 + \alpha_2 D73 + \alpha_3 D77 + \alpha_4 D81 + \alpha_5 D85 + \alpha_6 D89 + \alpha_7 D93 + \alpha_8 D97 + \beta$ (VL Prediction) + e_{it}					
α_1	6.099	−13.827	39.492	−2.638	−3.986
	(3.055)***	(−0.727)	(5.903)***	(−6.472)***	(−0.589)
α_2	10.075	15.555	63.822	−1.860	6.437
	(4.286)***	(0.618)	(5.673)***	(−5.899)***	(4.717)***
α_3	11.992	−45.292	34.127	−2.145	−7.515
	(4.659)***	(−1.802)*	(4.790)***	(−4.192)***	(−1.379)
α_4	24.289	−65.590	−18.727	−0.326	−1.482
	(9.169)***	(−2.049)**	(−2.604)***	(−0.625)	(−0.642)
α_5	22.262	−17.063	15.697	−0.992	−4.171
	(11.233)***	(−1.002)	(1.909)*	(−1.941)*	(−2.546)**
α_6	10.883	−53.833	3.305	−2.103	−7.471
	(4.783)***	(−2.733)***	(0.510)	(−4.709)***	(−3.590)***
α_7	19.957	62.951	5.755	0.753	−2.391
	(9.878)***	(2.465)**	(0.937)	(1.266)	(−2.168)**
α_8	1.268	−78.508	25.418	−3.187	−6.052
	(0.694)	(−2.632)***	(2.374)**	(−5.258)***	(−2.249)**
β	−0.1573	0.5828	0.4581	0.6322	1.0527
	(−1.930)*	(2.754)***	(4.357)***	(4.792)***	(3.743)***
Test: $\beta = 1$, χ^2	201.51***	3.88**	26.55***	7.777***	0.04
R^2	0.2601	0.4558	0.2350	0.2524	0.0902
Number of observations	519	434	451	451	449

Where D69–D97 are dummy variables representing the year during which the Value Line prediction was obtained.
Figures in parentheses below coefficient estimates are t-statistics. *, ** and ***, respectively, indicate significance at the 10%, 5% and 1% levels.

might expect based on the efficient markets hypothesis, the results vary depending on the forecasted variable. For stock returns, there is no evidence that Value Line has any predictive power. The slope coefficient in Panel A, while positive, is very small and indistinguishable from zero; the slope coefficient in Panel B is actually marginally significant and negative, indicating that stocks for which Value Line predicts relatively high appreciation in a given cohort year actually tend to do worse than stocks for which they predict lower appreciation. For earnings, sales, profit margins and earnings yields, our results are more favorable to Value Line. Regardless of whether we do (Panel B) or do not (Panel A) control for time series components, the slope coefficients for all of these variables are positive and statistically significant at the 1% level, indicating that Value Line's analysts do have predictive power over an approximately 4-year horizon vis-à-vis these variables. In both panels of Table 3, we also test the hypothesis that the slope coefficients equal one. A slope that is positive but significantly below one would be in accordance with La Porta's (1996) finding that analysts' growth expectations are too extreme. Clearly, our findings for earnings, sales and profit margins support this interpretation, as in both panels the slopes for these variables are significantly less than one. We do find, however, that Value Line's earnings yield forecasts are not extreme, because for this variable the slopes are very close to one.[16]

For stock prices (but not for other variables, for which only single point forecasts are provided), Value Line reports 3–5 year projected high and low prices. As explained earlier, we use the mean of these price projections (combined with forecasted dividends) to compute 4-year horizon projected stock returns. We now use these same high-low price projections to measure forecast uncertainty, and to determine whether the bias and predictive power of Value Line's stock return forecasts is related to this uncertainty. We define Value Line Forecast Uncertainty (VLFU) as $(P_{\text{high}}–P_{\text{low}})/0.5(P_{\text{high}} + P_{\text{low}})$, where P_{high} and P_{low} are, respectively, Value Line's 3–5 year projected high and low

[16] The R^2 statistics reported in Table 3, Panel B for model (7) should be interpreted with caution. While they are uniformly higher than for model (6), R^2 in this context is an ex-post measure and does not indicate greater ex-ante predictability using model (7). We believe the slope coefficients in the two models are comparable, and these generally do not indicate greater predictability with model (7).

Table 4
Tests for value line stock return forecast bias and predictive power, by degree of forecast uncertainty

Panel A: Tests for forecast bias

VL forecast uncertainty quintile	Number of observations	Mean VL forecast uncertainty	Mean VL predicted annual stock return (%)	Mean realized annual stock return (%)	Mean prediction – actual stock return (%)	t-Statistic
p1 (low)	90	0.5726	17.837	12.152	5.685	3.7828***
p2	91	0.8164	19.816	14.048	5.769	3.9815***
p3	88	0.9737	18.669	10.668	8.002	5.0519***
p4	93	1.1831	20.209	9.997	10.212	5.8309***
p5 (high)	92	1.4399	25.232	9.142	16.090	6.0239 ***

Panel B: Tests for predictive power. Model: Realized annual return = $\alpha + \beta$ (VL Predicted annual return) + e_{it}

Coefficient:	Model estimated For VL forecast uncertainty quintile:				
	p1 (low)	p2	p3	p4	p5 (high)
α	7.826	8.107	12.119	3.002	12.327
	(2.995)***	(2.950)***	(3.702)***	(0.854)	(3.406)***
β	0.2426	0.2998	−0.0777	0.3461	−0.1262
	(1.900)*	(2.458)**	(−0.509)	(2.154)**	(−1.152)
Test: $\beta = 1$, χ^2	35.20***	32.96***	49.90***	16.56***	105.64***
R^2	0.0318	0.0654	0.0030	0.0461	0.0130
Number of observations	90	91	88	93	92

Notes: Value Line Forecast Uncertainty (VLFU) is calculated as $(P_{\text{high}}–P_{\text{low}})/0.5\ (P_{\text{high}} + P_{\text{low}})$, where P_{high} and P_{low} are, respectively, Value Line's 3–5 year projected high and low stock prices. We normalize the uncertainty variable by dividing each firm's result by the average calculated uncertainty of all Dow stocks in the same cohort year. Thus, firms with VLFU exceeding one have above average forecast uncertainty relative to all Dow stocks in a given year, and vice-versa. The quintiles vary slightly in number of observations because we did not allow breakpoints to occur between firms that had the exact same VLFU. *,** and *** denote, respectively, statistical significance at the 10%, 5% and 1% levels.

stock prices. We normalize the uncertainty variable by dividing each firm's result by the average calculated uncertainty of all Dow stocks in the same cohort year. Thus, firms with VLFU exceeding one have above average forecast uncertainty relative to all Dow stocks in a given year, and vice-versa. We then sort firms into quintiles based on VLFU, and examine whether stock return forecast bias and predictive power varies across these quintiles using the same procedures used previously.[17]

The forecast uncertainty findings are reported in Table 4. It appears from the results in Panel A that Value Line's positive forecast bias increases with forecast uncertainty: the mean difference between predicted and actual annual stock return increases from 5.685% for firms in the lowest VLFU quintile to 16.09% for firms in the highest quintile. We note, however, that a significant positive forecast bias remains across all of the quintiles. The regression tests for predictive power, sorted by VLFU quintile, are reported in Panel B. While the slope coefficients do appear to vary across quintiles, and are significantly positive in three cases, the results fail to conclusively demonstrate that predictive power and VLFU are related, because the slope is actually highest for the fourth VLFU quintile.[18]

To gain further insight into how Value Line's predicted and realized values are related, as well as into how Value Line's predictions for different variables for the same firm are linked, we next examine how predicted and realized values differ across portfolios that are formed based on (ex-ante) Value Line predictions. These results are reported in Table 5, wherein we form portfolios based on quintiles of VLR48 (Value Line predicted stock returns) in Panel A, VLPCEPS (predicted % change in EPS) in Panel B and VLDPM (predicted change in profit margin) in Panel C. For each quintile resulting from each of these three sorts, we report the mean annual realized stock return over the subsequent 48 months (R48), the mean realized stock return orthogonal to market capitalization, book-to-market, past 4-year stock return, and beta (ORTHR48), the mean Value Line predicted stock return (VLR48), the realized % change in EPS (PCEPS), the predicted % change in EPS (VLPCEPS), the realized change in profit margin (DPM) and the predicted change in profit margin (VLDPM). By forming portfolios every four years and reporting average results across eight cohorts, we deliberately remove any impact of time series predictability in returns; thus, our portfolio tests should closely complement the regressions with dummy variables approach in Table 3 Panel B.

If Value Line has predictive power with respect to stock returns, then we would expect that the portfolio composed of the top 20% of firms each cohort year ranked on the basis of VLR48 (p5 in Panel A) would have higher R48 than the portfolio composed of the bottom 20% of firms (p1). Consistent with the regression tests of predictive power in Table 3, however, we find that this is not the case: the mean p5 stock returns are actually lower than the mean

[17] We are unable to calculate VLFU for the 1969 cohort because Value Line provides only a single point forecast for the 3–5 year horizon stock price in its Investment Survey issues in that year. We thank an anonymous referee for suggesting that we examine if stock return forecast bias and predictive power are related to forecast uncertainty.

[18] The regressions in Table 4, Panel B were also estimated using a variant of Model 7, in which the constant term is allowed to vary by cohort year. While some of the estimated slope coefficients were quite different, the evidence regarding a clear relation between the slope coefficients and VLFU remained inconclusive.

Table 5
Realized values for portfolios formed based on value line predictions

Quintile	p1 (low)	p2	p3	p4	p5 (high)	Number of observations
Panel A: Portfolios sorted based on value line's predicted stock return (VLR48)						
R48	8.89	11.21	12.45	11.43	6.86	519
ORTHR48	7.91	10.41	11.98	11.53	8.21	511
VLR48	10.83	16.22	19.56	23.04	31.74	519
PCEPS	28.50	25.94	35.53	59.39	6.01	434
VLPCEPS	54.23	62.55	102.73	95.56	189.37	434
DPM	−1.13	−0.73	−0.80	0.06	−1.64	451
VLDPM	0.46	0.65	1.04	1.58	2.43	451
Panel B: Portfolios sorted based on value line's predicted %change in EPS (VLPCEPS)						
R48	11.41	8.89	8.79	13.12	6.37	434
ORTHR48	9.58	7.81	8.41	13.88	7.78	429
VLR48	18.74	18.93	20.14	19.95	24.97	434
PCEPS	−3.30	9.01	18.30	42.49	90.65	434
VLPCEPS	19.42	40.09	59.89	84.62	289.44	434
DPM	−2.19	−1.40	−1.26	−0.44	−0.48	432
VLDPM	−0.50	0.27	0.81	1.40	2.79	432
Panel C: Portfolios sorted based on value line's predicted change in profit margin (VLDPM)						
R48	10.07	11.94	8.94	8.91	9.25	451
ORTHR48	8.91	11.05	8.65	9.17	10.97	446
VLR48	21.27	20.62	19.52	19.45	22.91	451
PCEPS	−3.83	17.73	22.39	62.13	67.34	432
VLPCEPS	35.94	50.31	70.00	115.15	254.13	432
DPM	−2.75	−1.14	−0.81	−0.48	1.01	451
VLDPM	−1.15	0.14	0.71	1.60	4.82	451

Notes: Portfolios are formed ex-ante every 4 years beginning September 30, 1969 based on Value Line 3–5 year horizon predictions published between July 1 and September 30 of the same year. We report quintiles for the means of the following variables (a "VL" prefix in a variable name indicates a Value Line forecast): R48 = average annual stock return over subsequent 48 months; ORTHR48 = average annual realized stock return orthogonal to relative market capitalization, book-to-market, stock return over previous 48 months, and beta (as reported in Value Line); PCEPS = % change in EPS between year $t-1$ and the average of years $t+3$, $t+4$ and $t+5$; DPM = change in profit margin between year $t-1$ and the average of years $t+3$, $t+4$ and $t+5$.

p1 stock returns. If realized stock returns are adjusted to make them orthogonal to factors that prior research has shown to affect cross-sectional returns, then there is virtually no difference in the realized adjusted returns between p5 and p1. Two other results in Panel A are worth noting. First, Value Line overpredicts stock returns, on average, for all five quintiles, thus underscoring the pervasive optimistic bias of the Value Line stock return projections. Second, the results demonstrate internal consistency in the form of a positive relation, at the firm level, across the set of Value Line predictions: firms that are predicted to experience higher stock returns are also predicted to have higher earnings growth and larger profit margin increases. For example, mean VLPCEPS for p5 firms with high VLR48 is 189.37%, while mean VLPCEPS for p1 firms with low VLR48 is only 54.23%.

The results for portfolios sorted based on predicted earnings (Panel B) and predicted profit margin (Panel C) confirm earlier regression findings that Value Line does have some power to predict (approximately) 4-year horizon changes in these variables. For example, in Panel B, the realized % change in EPS for the lowest prediction quintile is −3.30% vs. 90.65% for the highest quintile. Similarly, in Panel C, the realized change in profit margin for the lowest quintile is −2.75 vs. +1.01 for the highest quintile. We also confirm earlier findings that Value Line analysts are uniformly overoptimistic: for all quintiles the realized change in EPS or profit margin is lower than the predicted change. Finally, the results continue to show internal consistency, in that firms with higher VLPCEPS or VLDPM also tend to have higher predicted stock returns, albeit not by large margins.[19]

4. Robustness tests

As an initial measure of the robustness of our basic findings regarding unbiasedness and predictive power, we test whether these findings are sensitive to outliers. These results are reported in Panel A of Table 6. Here we repeat some of the tests conducted in Tables 2 and 3, except that

[19] We also examined the internal consistency of Value Line's forecasts by running cross-sectional regressions of forecast errors for each variable on forecast errors for other variables. These results confirm the finding that forecast errors across firms for stock returns, earnings and profit margins are significantly positively related to each other.

Table 6
Robustness tests

Panel A: Tests with outliers trimmed

Unbiasedness tests (Note: VL Forecast Error = VL Prediction – Realized)

	Stock return (%)	%CH in EPS	%CH in sales per share	Change in profit margin (%)	Change in earnings yield
Mean VL prediction	19.962	76.369	45.315	1.076	−1.436
Mean realized value	10.297	22.712	39.965	−0.826	−2.009
Mean VL forecast error	9.665	53.656	5.350	1.902	0.573
t-Statistic	14.166***	9.350***	2.471**	12.373***	1.451
Number of observations	494	412	429	429	427

Tests for predictive power: Realized value = $\alpha + \beta$ (VL Prediction)

Coefficient:					
α	8.443	22.367	24.178	−1.260	−1.621
	(6.975)***	(4.783)***	(7.664)***	(−8.436)***	(−3.944)***
β	0.0929	0.0045	0.3484	0.4037	0.2701
	(1.739)*	(0.085)	(5.758)***	(4.667)***	(1.808)*
Test: $\beta = 1$, χ^2	288.42***	347.83***	116.00***	47.54***	23.86***
R^2	0.0065	0.0000	0.0840	0.0703	0.0412
Number of observations	494	412	429	429	427

Panel B: Tests with alternative variable definitions

Unbiasedness tests (Note: VL Forecast error = VL Prediction – Realized value)

	Orthogonal stock return (%)	Change in EPS as percent of initial stock price
Mean VL prediction	20.407	8.365
Mean realized value	10.025	1.504
Mean VL forecast error	10.382	6.860
t-Statistic	14.752***	8.274***
Number of observations	511	453

Tests for predictive power: Realized value = $\alpha + \beta$ (VL prediction) + e_{it}

Coefficient:		
α	8.395	−0.0143
	(4.151)***	(−0.772)
β	0.0798	0.3504
	(0.847)	(1.309)
R^2	0.0022	0.0567
Number of observations	511	453

Notes: In these tests, the extreme 5% of realized values (top and bottom 2.5%) included in Tables 2 and 3, along with firm-matched VL predicted values, are trimmed (Panel A). The orthogonal stock return (Panel B) is defined as the constant term plus the residual from a regression of, respectively, R48 and VLR48 on RMC (relative market capitalization), BM (book-to-market), PR48 (average annual stock return over prior 48 months) and BETA (as reported in Value Line). All independent variables in the regression are in deviation from the mean form. *,** and *** denote, respectively, statistical significance at the 10%, 5% and 1% levels (Panel B).

the extreme 5% of observations of the *realized values* (2.5% in each tail), along with firm-matched Value Line predicted values, are trimmed. As regards bias, for the stock returns, earnings and profit margins, the overall trimmed results are very similar to the untrimmed and confirm that Value Line has grossly overpredicted these variables on average. For sales, the trimmed results show a slight tendency to overpredict (forecast error significantly positive at the 5% level), whereas the untrimmed results did not. Conversely, for earnings yields, the trimmed results show no significant difference between the means of the actual and predicted values, whereas the untrimmed results indicated that Value Line was slightly too conservative in predicting earnings yields.

We also report simple tests for predictive power with the trimmed data in Table 6, Panel A. For brevity, we only report trimmed results without cohort year dummy variables, but the conclusions are unchanged when the latter are included. For stock returns, sales and profit margins, the regressions estimated with trimmed data yield very similar conclusions to those estimated with untrimmed data (as reported in Table 3, Panel A), although the slope coefficient in Table 6 is 0.0929 in the case of stock returns and is marginally significant. Some interesting differences do emerge, however, for the remaining variables. For earnings, using the trimmed data, the slope is very nearly zero and insignificant, indicating that in non-extreme cases Value Line has no predictive power with respect to earnings growth. Similarly, we find that Value Line's predictive power with respect to earnings yields is notably lower with the trimmed data than with the untrimmed, albeit in this case some degree of predictive power may remain.

We further examine the robustness of our findings by repeating our basic tests using alternative variable definitions, focusing on what we consider the two most important variables. We create an orthogonal stock return by taking the constant term plus the residual from a regression of (respectively) R48 and VLR48 on relative market capitalization, book-to-market, stock return over the prior 48 months, and beta as reported in Value Line, with all independent variables in deviation from the mean form. We use these variables because previous studies, e.g. DeBondt and Thaler (1985, 1987) and Fama and French (1992), suggest they are important determinants of the cross-section of stock returns, and we want to ascertain if Value Line's stock return predictions have any value beyond what can be explained by these measures. As shown in Panel B of Table 6, neither unbiasedness nor predictive power using orthogonal stock returns are markedly different than when unadjusted returns are used; the severe optimistic bias and lack of evidence of predictive power remain evident in the case of the orthogonal returns.

In many previous studies of analyst forecasts, earnings changes are normalized by dividing both predicted and realized earnings per share by the initial stock price. To see if our results are sensitive to this normalization, we reran our basic tests using this alternative measure of earnings, defined in footnote 9. We find (Table 6, Panel B) that Value Line's earnings forecasts remain grossly overoptimistic, as the forecast error (predicted–realized) is large and significantly positive at any conventional level.[20] However, unlike with the simpler definition of earnings change used in Table 3, we now find no evidence of predictive power: the slope coefficient in a regression of realized values on predicted values (albeit positive) is insignificantly different from zero. Clearly, therefore, one important conclusion that emerges from Table 6 is that Value Line's ability to predict earnings across this cross-section of firms depends crucially on how the earnings change variable is defined. Results are much less favorable to Value Line when outliers are trimmed or when earnings changes are normalized by the current stock price.[21]

Another issue which arises with respect to earnings is the treatment of extraordinary (non-recurring) gains and losses. Value Line excludes these items from its historical and forecast EPS tables, but provides the total amounts, by year, in footnotes to its stock reports. Because Value Line only provides forecasts for EPS excluding extraordinary items, we believed it best to exclude these items in all of the tests reported in this study. However, to ascertain if our results are sensitive to this treatment, we randomly selected 50 stock reports and repeated the tests reported in Tables 2 and 3, Panel A for percent change in EPS, change in profit margin, and change in earnings yield, where the earnings were defined as alternately including and excluding extraordinary items. These results (not reported) show that the findings we report in this paper are not highly sensitive to this choice.[22]

All of the results we have presented thus far are for the Dow dataset. As discussed earlier, one potentially severe limitation is that the included stocks are not representative of the typical stock Value Line covers. To ascertain if our stock return prediction results for the Dow stocks are likely to hold for a broader cross-section, we conduct portfolio tests for the "top 100" database, described earlier. These test results are reported in Table 7. Specifically, we form portfolios every 4 years beginning September 30, 1969 based on Value Line's listing of the top 100 stocks by appreciation potential (these stocks have the greatest predicted total returns over a 3–5 year horizon). The "All Top 100 Stocks" column is for an equally weighted portfolio holding all stocks on the list. The safety rank $= 1, 2, 3$, safety rank $= 4$, and safety rank $= 5$ portfolios, respectively, contain stocks on the top 100 list with the indicated safety ranks, and the timeliness rank $= 1, 2, 3$ portfolio contains stocks on the top 100 list with a timeliness rank of 3 or better.[23] Finally, the "top 33" portfolio is an equally weighted combination of the top one-third of stocks (ranked by predicted return) on the top 100 list. We estimate time series regressions of the portfolio excess returns against various combinations of factors shown in previous studies (e.g. Fama and French, 1992; and Carhart, 1997) to be strongly related to realized stock returns.[24]

The results in Table 7 are very easy to summarize. Not one single portfolio we construct from stocks on the top 100 list significantly outperformed the market, regardless

[20] Note that DEPSP (change in earnings as a percent of stock price) and DEY (change in earnings yield) differ. When computing the earnings yield in year $t + 4$, the average of realized earnings per share in years $t + 3$ to $t + 5$ is divided by the stock price in year $t + 4$ rather than by the stock price in year t.

[21] We also examined Value Line forecast bias and predictive power broken down by type of firm (industrial, transport or utility). These results (available from the authors on request) showed that firm type did not matter in evaluating forecast bias: Value Line's stock return, earnings and profit margin forecasts were significantly optimistic for all classifications. However, for reasons we cannot fully explain, Value Line did appear to have significant predictive power vis-à-vis utility stock returns, even though their record in forecasting earnings and profit margins for utilities is no better than for other types of firms.

[22] If anything, the positive bias in predicted PCEPS and DPM is actually *larger* when extraordinary items are included in historical and realized EPS, probably because these items are more often negative than positive. As regards predictive power, our results for the randomly selected subsample indicate less ability by Value Line to predict changes in earnings and profit margins (compared to the full sample) regardless of whether extraordinary items are included in EPS; there is no marked difference in predictive power with respect to including or excluding these items, other things held constant.

[23] Value Line defines its safety rank as a measurement of potential risk associated with an individual stock. The Safety Rank is computed by averaging two other Value Line indexes – the Price Stability Index and the Financial Strength Rating. Safety Ranks range from 1 (Highest) to 5 (Lowest).

[24] The factors are ERM (market return less T-Bill return), SMB (excess return on small cap stocks relative to large cap), HML (excess return on high book-to-market relative to low book-to-market stocks) and UMD (excess return on stocks with high return momentum relative to those with low momentum). All of the factors, along with the monthly T-bill returns used to construct the excess portfolio returns, were downloaded from Kenneth French's website at Dartmouth College.

Table 7
Ex-post performance of 100 stocks listed in value line as having the greatest appreciation potential

	All Top 100 Stocks 0.6957	Safety Rank = 1, 2, 3	Safety Rank = 4	Safety Rank = 5	Timeliness Rank = 1, 2, 3	Top 33 Stocks
Mean excess return	0.6957	0.5481	0.7536	0.9010	0.7276	0.5889
	(1.6477)	(1.4757)	(1.5861)	(1.5131)	(1.7130)*	(1.1788)
Jensen's alpha	0.0637	−0.0294	0.0883	0.2045	0.0889	−0.0629
	(0.2415)	(−0.1355)	(0.2716)	(0.4317)	(0.3374)	(−0.1714)
FF 3−Factor model	−0.2530	−0.3385	−0.1642	−0.1065	−0.1584	−0.3673
alpha	(−1.4722)	(−2.2653)**	(−0.6761)	(−0.2736)	(−0.8394)	(−1.2739)
4−Factor model	0.1646	−0.0193	0.2922	0.5686	0.2383	0.3096
alpha	(1.0405)	(−0.1359)	(1.2410)	(1.4914)	(1.3267)	(1.1553)

Notes: Portfolios are formed ex-ante every 4 years beginning September 30, 1969 based on Value Line's listing of the top 100 stocks by appreciation potential (these stocks have the greatest predicted total returns over a 3–5 year horizon). The "All Top 100 Stocks" column is for an equally weighted portfolio holding all stocks on the list. The Safety Rank = 1, 2, 3, Safety Rank = 4, and Safety Rank = 5 portfolios, respectively, contain stocks on the top 100 list with the indicated safety ranks, and the Timeliness Rank = 1, 2, 3 portfolio contains stocks on the top 100 list with a timeliness rank of 3 or higher. The Top 33 Stocks portfolio is an equally weighted combination of the top one-third of stocks (ranked by predicted return) on the top 100 list. Figures in parentheses below coefficient estimates are *t*-statistics. *,** and ***, respectively, indicate significance at the 10%, 5% and 1% levels.

of the performance evaluation model used.[25] These results for the top 100 dataset are consistent with the earlier conclusion, based on the Dow data, that Value Line demonstrates no predictive power vis-à-vis long run stock returns.

5. Conclusion

In sharp contrast to the previously well-documented ability of Value Line timeliness ranks to predict future short-run stock performance, we find that Value Line's long-term stock return projections are extremely overoptimistic and have no predictive power. Predicted returns for the Dow stocks have averaged 20.3% per annum; this figure is about twice the level of realized returns on these stocks over the 1969–2001 period, and considerably above the long-term average stock market return in the US. When we regress future realized returns over a 4-year horizon on Value Line's predicted 3–5 year returns for our Dow dataset, we find that the predicted returns are not significantly related to the future realized returns. This finding holds regardless of whether we control for time series effects and/or for other factors that previous studies have shown to be related to realized returns.

We shed additional light on Value Line's poor performance in predicting long-horizon stock returns by also examining their forecasts of earnings, sales, profit margins and earnings yields. We note, first, that there is a strong degree of consistency across Value Line's forecasts of various measures: Table 5 shows that firms with higher predicted stock returns also tend to have higher predicted growth in earnings and profit margins. It is, therefore, perhaps unsurprising that Value Line's record forecasting earnings changes over 3–5 year horizons is (at best) only marginally better than their stock return prediction record. We do find a significant positive cross-sectional relation between predicted and actual earnings changes; however, this relation essentially disappears if extreme observations are trimmed from the sample or if earnings changes are normalized based on initial stock prices. Moreover, Value Line's earnings projections are even more upwardly biased than their stock return predictions. In contrast to this poor performance in predicting earnings, we find little evidence of bias in forecasts of earnings yields, and there is even some robust evidence of predictive power with respect to this variable. Consequently, our results indicate that Value Line's overoptimism and poor predictive power vis-à-vis stock returns is driven primarily by similar problems predicting earnings growth at the firm level, rather than by systematic mistakes in forecasts of future valuations as reflected in earnings yields.

Because earnings can be further decomposed into sales and profit margins, our examination of these predictions yields further insights into why Value Line's earnings and stock return forecasts perform so poorly. Value Line's sales predictions exhibit, at most, only a slight degree of upward bias, and there is robust evidence that Value Line displays cross-sectional predictive power in forecasting sales. The profit margin predictions are strongly upwardly biased, but there is robust evidence that they have predictive power as well. Thus, we can conclude that the *bias* in earnings forecasts appears to be entirely due to the extreme upward bias in projected profit margins, but we cannot easily explain the lack of predictive power with respect to earnings revealed by the robust tests reported in Table 6.

[25] When using the Fama and French 3-factor model, we obtain negative alphas for all of the portfolios, and the alpha is significantly negative when we restrict it to hold stocks with a Value Line safety rank of 3 or better. The closest our results come to economic (if not statistical) significance are the 4-factor alphas for the "all top 100," "timeliness rank = 1, 2, 3" and "top 33 stocks." These alphas are all in the range of 0.16–0.31% per month (about 2.0–3.8% annualized). However, when we segregate the top 100 stocks by Value Line safety rank, we find that only those with safety ranks below 3 appear to have positive 4-factor alphas, indicating that the positive alpha on the top 100 portfolio is most likely due to unobserved risk factors that are not captured by even the 4-factor model.

The poor overall record Value Line exhibits in its long-term stock return and earnings forecasts supports the view that the spectacular past performance of Value Line's timeliness indicator likely reflects either its close alignment with other known anomalies such as momentum and/or post-earnings announcement drift, data mining, or some combination of these factors. At a minimum, Value Line's long-term forecast record as documented herein should caution investors not to rely mechanically on these projections for either stock selection, valuation or planning purposes. Similarly, the extreme upward bias and lack of predictive power exhibited by Value Line's stock return projections calls into question the common practice of using these predictions as proxies for the cost of equity in cost-of-capital studies, and their use as proxies for aggregate ex-ante expected returns in tests of asset pricing models.

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References

Affleck-Graves, John, Mendenhall, Richard R., 1992. The relation between the value line enigma and post-earnings-announcement drift. J. Financial Econ. 31 (1), 75–96.

Agrawal, Anup, Chen, Mark A., 2005. Analyst Conflicts and Research Quality. Working Paper.

Ang, James S., Peterson, David R., 1985. Return, risk, and yield: Evidence from ex-ante data. J. Finance 40 (2), 537–548.

Asquith, Paul, Mikhail, Michael B., Au, Andrea S., 2005. Information content of equity analyst reports. J. Financial Econ. 75 (2), 245–282.

Barber, Brad, Lehavy, Reuven, McNichols, Maureen, Trueman, Brett, 2001. Can investors profit from the prophets? security analyst recommendations and stock returns. J. Finance 61 (2), 531–563.

Barber, Brad, Lehavy, Reuven, McNichols, Maureen, Trueman, Brett, 2003. Reassessing the returns to analysts' stock recommendations. Financial Anal. J. 59 (2), 88–96.

Botosan, Christine A., 1997. Disclosure level and cost of equity capital. Account. Rev. 72 (3,Jul), 323–349.

Botosan, Christine A., Plumlee, Marlene A., 2002. A re-examination of disclosure level and the expected cost of equity capital. J. Account. Res. 40 (1,Mar), 21–40.

Botosan, Christine A., Plumlee, Marlene A., 2005. Assessing alternative proxies for the expected risk premium. Account. Rev. 80 (1), 21–53.

Bradshaw, Mark T., Brown, Lawrence D., 2005. Do sell-side analysts exhibit differential target price forecasting ability. Working Paper.

Bradshaw, Mark T., Richardson, Scott A., Sloan, Richard G., 2006. The relation between corporate financing activities, analysts' forecasts, and stock returns. J. Account. Econ. 42 (1–2), 53–85.

Brav, Alon, Lehavy, Reuven, Michaely, Roni, 2005. Using expectations to test asset pricing models. Financial Manage. 34 (3), 31–64.

Brown, Philip, Foster, George, Noreen, Eric, 1985. Security analyst multi-year earnings forecasts and the capital market. In: Studies Account. Res., vol. 21. American Accounting Association.

Butler, Kirt C., Lang, Larry H.P., 1991. The forecast accuracy of individual analysts: Evidence of systematic optimism and pessimism. J. Account. Res. 29 (1), 150–156.

Carhart, Mark M., 1997. On persistence in mutual fund performance. J. Finance 52 (1), 57–82.

Choi, James J., 2000. The value line enigma: The sum of known parts?. J. Financial Quant. Anal. 35 (3Sep), 48–498.

DeBondt, Werner F.M., Thaler, Richard, 1985. Does the stock market overreact? J. Finance 40 (3), 793–805.

DeBondt, Werner F.M., Thaler, Richard H., 1987. Further evidence on investor overreaction and stock market seasonality. J. Finance 42 (3), 557–581.

Dechow, Patricia M., Sloan, Richard G., 1997. Returns to contrarian investment strategies: Tests of naive expectations hypotheses. J. Financial Econ. 43 (1), 3–27.

Desai, Hemang, Jain, Prem C., 1995. An analysis of the recommendations of the 'superstar' money mangers at barron's annual roundtable. J. Finance 50 (4), 1257–1273.

Easterwood, John C., Nutt, Stacey R., 1999. Inefficiency in analysts' earnings forecasts: Systematic misreaction or systematic optimism? J. Finance 54 (5), 1777–1797.

Fama, Eugene F., French, Kenneth R., 1992. The cross-section of expected stock returns. J. Finance 47 (2), 427–466.

Francis, Jennifer, LaFond, Ryan, Olsson, Per M., Schipper, Katherine, 2004. Costs of equity and earnings attributes. Account. Rev. 79 (4), 967–1010.

Gregory, N.A., 1983. Testing an aggressive investment strategy using value line ranks: A comment. J. Finance 38 (1), 257–258.

Holloway, Clark, 1981. A note on testing an aggressive investment strategy using value line ranks. J. Finance 36 (3), 711–719.

Huberman, Gur, Kandel, Shmuel, 1990. Market efficiency and value line's record. J. Bus. 63 (2), 187–216.

Huberman, Gur, Kandel, Shmuel, 1987. Value line rank and firm size. J. Bus. 60 (4), 577–590.

Kaplan, Robert S., Weil, Roman L., 1973. Risk and the value line contest. Financial Anal. J. 29 (4), 56–61.

La Porta, Rafael, 1996. Expectations and the cross-section of stock returns. J. Finance 51 (5), 1715–1742.

O'Brien, Patricia C., 1988. Analysts' forecasts as earnings expectations. J. Account. Econ. 10 (1), 53–83.

Peterson, David R., 1987. Security price reactions to initial reviews of common stock by the value line investment survey. J. Financial Quant. Anal. 22 (4), 483–494.

Peterson, David R., 1995. The Informative role of the value line investment survey: Evidence from stock highlights. J. Financial Quant. Anal. 30 (4), 607–618.

Shelton, John P., 1967. The value line contest: A test of the predictability of stock price changes. J. Bus. 40 (3), 254–269.

Siegel, Jeremy, 1998. Stocks for the long run, second ed. McGraw-Hill.

Stickel, Scott E., 1985. The effect of value line investment survey rank changes on common stock prices. J. Financial Econ. 14 (1), 121–143.

Value Line, 2000. How to Invest in Common Stocks: A Guide to Using the Value Line Investment Survey Expanded Edition. Value Line Publishing Inc., New York.

White, Halbert, 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica 48 (4), 817–838.