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A large body of both academic and industry research supports the efficacy of value strategies for choosing individual stocks. Fama and French [1992, 1993]; Lakonishok, Shleifer, and Vishny [1994]; and Capaul, Rowley, and Sharpe [1993] among others present evidence from both the U.S. and other countries that over the long term, value stocks outperform growth stocks. Yet value strategies are far from riskless. They can produce long periods of poor performance.

In an effort to improve upon value strategies, researchers have tried to forecast these returns, with mixed results. Arnott [1992], Fan [1995], Sorensen and Lazzara [1995], Bernstein [1995], and Kao and Shumaker [1999] investigate models that forecast differences between the returns to value and growth strategies according to measures of aggregate economic and financial conditions. These studies focus on variables like the earnings yield on the S&P 500, the slope of the yield curve, corporate credit spreads, corporate profits, and other macroeconomic measures. Some of these variables appear to have power to forecast value versus growth returns, and others do not.

One criticism of this approach is that it may be susceptible to uncovering spurious ex post relationships. Because all the variables may be economically meaningful, it becomes very difficult to determine which of the observed relations are real and which ones are artifacts of the data.

We propose a different approach considering two

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simple and intuitive variables: 1) the spread in valuation multiples between a value portfolio and a growth portfolio (the value spread); and 2) the spread in expected earnings growth between a growth portfolio and a value portfolio (the earnings growth spread).<sup>1</sup>

The motivation for these variables follows from a version of the Gordon [1962] model. This model states that:

$$E(R) = E/P + g \quad (1)$$

where  $E(R)$  represents the expected return of a given stock,  $E/P$  represents the stock's earnings yield, and  $g$  represents the expected earnings growth in perpetuity.<sup>2</sup>

The Gordon model is a simplistic decomposition of the expected return of a stock, and it relies on some strong assumptions, but it is a useful heuristic nevertheless. According to this model, expected returns can be decomposed into two factors: 1) a simple valuation ratio, and 2) a forecast of future earnings growth. This decomposition motivates our work.

We can rewrite Equation (1) for both value stocks and growth stocks as follows:

$$E(R_{\text{value}}) = E/P_{\text{value}} + g_{\text{value}} \quad (2)$$

$$E(R_{\text{growth}}) = E/P_{\text{growth}} + g_{\text{growth}} \quad (3)$$

Taking the difference between these two equations, we arrive at a simple style timing model:

$$E(R_{\text{value}} - R_{\text{growth}}) = (E/P_{\text{value}} - E/P_{\text{growth}}) - (g_{\text{growth}} - g_{\text{value}}) \quad (4)$$

The first term  $(E/P_{\text{value}} - E/P_{\text{growth}})$  represents the value spread. Since value stocks are often defined as stocks with high  $E/P$  (or other similar valuation ratio), and growth stocks are often defined as stocks with low  $E/P$ , the value spread should by construction be positive. This first style timing variable is simply motivated by the observation that, all else equal, when the difference between  $E/P$  for value stocks and  $E/P$  for growth stocks is abnormally great, the difference between the expected return to value stocks and growth stocks should be abnormally great. In other words, when the value spread is especially wide, cheap stocks are *really* cheap, and expensive stocks are *really* expensive.

The second term in Equation (4) is the growth spread,  $(g_{\text{growth}} - g_{\text{value}})$ . Note that in reversing the nota-

tion for the value spread, we express the growth spread as the expected earnings growth for growth stocks minus the expected earnings growth for value stocks. Since growth stocks tend to be strong earners, and value stocks tend to be relatively distressed,  $(g_{\text{growth}} - g_{\text{value}})$  should be positive.

Equation (4) shows that both the value spread and the growth spread are important determinants of the expected return difference between value and growth. A high  $E/P$  stock does not necessarily have a high expected return if it also has low expected earnings growth. In other words, a high  $E/P$  can be justified if a stock's expected earnings growth is poor. Thus, a wider-than-normal value spread does not necessarily signal that the expected return to value is higher than growth. If the earnings growth spread is sufficiently wide, it can justify a wider-than-normal value spread and hence no greater-than-normal expected return premium.

We find that both value spreads and earnings growth spreads are important indicators of the attractiveness of value versus growth. Using data from January 1982 through October 1999, we find that the combination of the value spread and the earnings growth spread forecasts the future returns of value versus growth. This relation is both statistically and economically significant. Moreover, while we motivate the analysis using a version of  $E/P$ , we find that the results are general to other common valuation ratios. The three measures of value that we focus on are: earnings-to-price, book-to-price, and sales-to-price.

At the time of this writing (November 1999), our model is forecasting near-historic highs for the expected return of value versus growth. Value spreads are near historic highs, and the level of these spreads cannot be explained by high expected earnings growth spreads. In fact, expected earnings growth spreads are actually relatively low. In other words, value stocks currently appear to be far cheaper than growth stocks compared to historical norms, but rather than giving up more expected earnings growth than normal, value stocks are actually giving up less expected earnings growth.

## DATA AND METHODOLOGY

Our first goal is to form a simple but robust proxy for value. We believe that a composite of three accounting ratios that incorporates earnings, book value, and sales along with price captures the main characteristic

of value, but is not overly sensitive to any one accounting item. We focus on the measures of value as follows: earnings-to-price (E/P), book-to-price (B/P), and sales-to-price (S/P). Each month-end, from December 1981 through September 1999, we form each of these three value indicators for each stock in our investable universe as follows:<sup>3</sup>

$E/P_{it}$  = IBES forecasted next twelve months' earnings per share at time  $t$  divided by IBES stock price at time  $t$ .

$B/P_{it}$  = Compustat annual balance sheet common equity divided by market value of equity at time  $t$ .

$S/P_{it}$  = Compustat annual sales divided by the sum of market value of equity at time  $t$  plus Compustat annual balance sheet book value of long-term debt minus Compustat annual balance sheet cash and cash-equivalents. Note that we use a proxy for the value of the entire firm rather than the value of the firm's equity, because sales apply to the entire capital structure of the firm as opposed to book value and earnings, which apply only to equityholders.

The investable universe for each month is defined as the top 1,100 most liquid stocks, as measured by the trailing quarter's total dollar trading volume, that also rank among the top 1,500 stocks by market capitalization.<sup>4</sup> We believe this restricted universe makes our analysis relevant to institutional money managers.

Asness, Porter, and Stevens [1999] find that trading strategies based on industry-adjusted value factors significantly outperform those based on non-industry-adjusted valuation factors. In other words, value is a better strategy for choosing stocks within an industry than for choosing industries. Following the Asness, Porter, and Stevens methodology, we form industry-adjusted versions of each of the three value measures. This approach compares each stock's accounting ratio to its industry average rather than to the entire universe. This differs from the approach reflected in traditional value and growth indexes, such as the S&P/BARRA and Frank Russell indexes, which use non-industry-adjusted measures of value and growth and hence entail significant industry biases.<sup>5</sup>

For each of the three raw (i.e., non-industry-adjusted) value measures, we form an industry-adjusted version by subtracting the industry average as follows:

$$\text{Industry-Adjusted } E/P_{it} = E/P_{it} - \overline{E/P}_{it} \quad (5)$$

$$\text{Industry-Adjusted } B/P_{it} = B/P_{it} - \overline{B/P}_{it} \quad (6)$$

$$\text{Industry-Adjusted } S/P_{it} = S/P_{it} - \overline{S/P}_{it} \quad (7)$$

where  $\overline{E/P}_{it}$ ,  $\overline{B/P}_{it}$ , and  $\overline{S/P}_{it}$  are stock  $i$ 's industry average valuation ratio at time  $t$ .<sup>6</sup>

We believe that each of these three measures represents a noisy proxy for value. To obtain a robust aggregate industry-adjusted value measure, we form a composite of industry-adjusted  $E/P$ ,  $B/P$ , and  $S/P$ . To combine the three value indicators into one overall measure of value, every month we first rank each stock in the universe on each variable. Then, for each stock we compute its average rank across the three industry-adjusted value measures as follows:

$$\text{Value Composite} = \text{Average} [\text{Rank}(E/P), \text{Rank}(B/P), \text{Rank}(S/P)]$$

We then rerank our universe of stocks on this average rank measure. Thus, our overall measure of value for each stock is a rank based on a one-third weight for each of our three industry-adjusted value indicators.

The second goal is to construct a measure of expected earnings growth. We use analysts' long-term earnings growth estimates to form a proxy for expected growth for each stock  $i$  as follows:

$$\text{Growth}_{it} = \frac{\text{IBES Median Long-Term EPS Growth Forecast at Time } t}{\text{Growth Forecast at Time } t}$$

According to Equation (1), we are interested in a proxy for current expected earnings growth in perpetuity. There are some potential problems with our proxy. First, analysts may not update their long-term forecasts in one leap. Rather, they may move slowly (psychologists call this anchoring and adjustment). Thus, the current IBES data may lag actual estimates of long-term earnings growth.

Second, IBES uses a five-year horizon to define long-term growth. Some of the expected earnings growth priced into stocks (rationally or irrationally) may be forecasted to occur beyond this five-year horizon.

Third, to the extent analysts overextrapolate past earnings growth in their forecasts of future earnings growth, the IBES forecasts may be biased. Fourth, this

expected earnings growth measure is available only from 1982–1999 and serves as the limit in testing our model farther back in time.

To the extent all these problems are material, they could weaken the forecasting power of this variable or the statistical power of the tests.

Exhibit 1 shows that over the last eighteen years the expected real earnings growth of the S&P 500 (market capitalization-weighted growth<sub>it</sub> minus one-year trailing inflation) has been steadily increasing.<sup>7</sup> Analysts are currently exceptionally bullish about future earnings growth for the overall market.

With a composite measure of industry-adjusted valuation and a measure of expected earnings growth for each stock, we are armed to proceed with the style timing analysis.

## PERFORMANCE OF VALUE STRATEGIES

Exhibit 2 presents the performance for each of the three industry-adjusted value measures (E/P, B/P, and S/P), as well as the composite version. We first form four sets of decile portfolios by sorting all stocks in our universe separately on each of the three individual intra-industry value measures and on the composite value measure. We then form zero-investment portfolios by subtracting the equal-weight returns on decile 1 (growth stocks) from the equal-weight returns on decile 10 (value stocks). The portfolios are rebalanced quarterly.<sup>8</sup> In addition, the zero-investment portfolio returns are condi-

## EXHIBIT 2 VALUE STRATEGY PERFORMANCE DECILE 10 (VALUE) MINUS DECILE 1 (GROWTH) JANUARY 1982–OCTOBER 1999

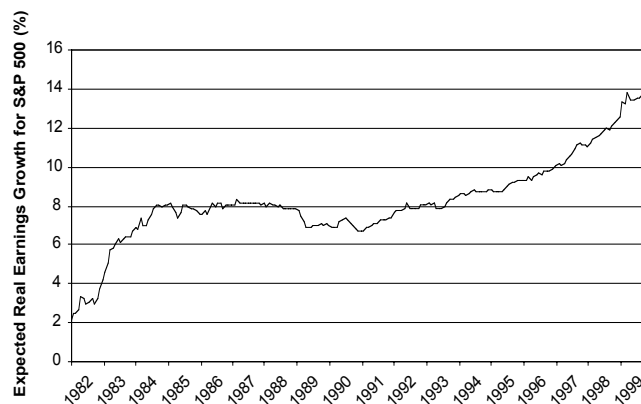
	E/P	B/P	S/P	Comp.
Average (annualized) (%)	2.74	3.38	6.79	6.25
Std. Dev. (annualized) (%)	9.83	9.52	8.93	10.75
Annual Sharpe Ratio	0.28	0.36	0.76	0.58
t-Statistic	1.18	1.50	3.21	2.46
Beta with S&P 500	0.00	−0.03	−0.02	−0.03
Best 12 Months (%)	34.7	25.5	34.6	46.1
Worst 12 Months (%)	−36.1	−26.8	−15.8	−28.1

tionally beta-adjusted each month by subtracting the product of the net beta (calculated using BARRA's betas) of the portfolio and the monthly excess return on the S&P 500.

As many other authors have found, value outperformed growth over this period. From 1982 to 1999, a zero-investment portfolio based on our composite indicator that is long decile 10 (value stocks) and short decile 1 (growth stocks) produces excess returns of 6.25% per year. This equates to an annual Sharpe ratio of 0.58, which is statistically significant with a t-statistic of 2.46.

Exhibit 3 presents the rolling twelve-month excess returns of our composite value strategy. While value stocks on average beat growth stocks, there are sustained periods of poor performance. Since 1982 there have been three major bear markets for value: 1989–1990, 1995–1996, and, most recently, 1998–1999.

## EXHIBIT 1 EXPECTED REAL LONG-TERM EARNINGS GROWTH — S&P 500 INDEX JANUARY 1982–OCTOBER 1999

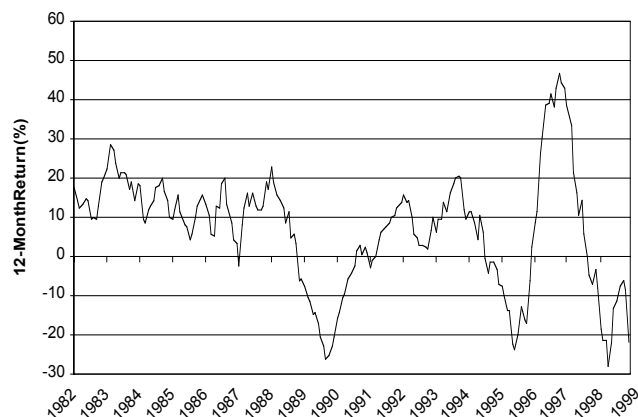


## FORECASTING VALUE VERSUS GROWTH

Given that value strategies can produce prolonged droughts, any indication of when these tough periods will occur would be, to say the least, rather useful. We propose two variables to predict the returns of the value strategy. The first is the composite value spread, which is calculated as follows:

1. Again, form decile portfolios each month by sorting on the composite industry-adjusted value measure from low to high. We define the value stock portfolio as decile 10 (highest composite value) and the growth stock portfolio as decile 1 (lowest composite value).
2. Compute the median of each of the three raw

**EXHIBIT 3**  
**ROLLING TWELVE-MONTH PERFORMANCE OF**  
**THE VALUE STRATEGY**  
**DECILE 10 (VALUE) MINUS DECILE 1 (GROWTH)**  
**JANUARY 1982-OCTOBER 1999**



accounting ratios (E/P, B/P, and S/P) for both decile 10 (value stocks) and decile 1 (growth stocks), and then compute the ratio as follows:

$$E / P \text{ Spread}_t = \frac{(\text{Value Portfolio Median } E / P_{it})}{(\text{Growth Portfolio Median } E / P_{it})} \quad (9)$$

$$B / P \text{ Spread}_t = \frac{(\text{Value Portfolio Median } B / P_{it})}{(\text{Growth Portfolio Median } B / P_{it})} \quad (10)$$

$$S / P \text{ Spread}_t = \frac{(\text{Value Portfolio Median } S / P_{it})}{(\text{Growth Portfolio Median } S / P_{it})} \quad (11)$$

E/P spread<sub>t</sub>, for example, represents the multiple that growth stocks are selling for versus value stocks at time t. Although E/P spread<sub>t</sub> should always be greater than 1.0, a wider-than-average E/P spread<sub>t</sub> might represent a time when value stocks are abnormally cheap relative to growth stocks.<sup>9</sup>

- While we present evidence for each of the three spreads individually, we focus on a composite valuation spread that equally weights each of the three spreads. As before, we believe this composite value spread represents a more robust measure of the current relative pricing of value versus growth stocks than a spread based on any single valuation measure.

To form the composite value spread, we first standardize separately each of the three value spread variables formed in Equations (9)–(11) so that their time series average is zero and standard deviation is 1.0.

We next average each of the three standardized value spread variables, and restandardize to form the composite value spread measure. When the composite value spread is zero, value stocks are cheaper than growth stocks by their historical average amount. A positive composite value spread indicates value stocks are cheaper than normal (value spread is wider than normal), and a negative composite value spread indicates value stocks are not as cheap as normal (value spread is narrower than normal).

Note that in computing the spread we use ratios rather than differences. This removes the influence of the overall market price. Following a period of strong market performance, valuation ratios (E/P, B/P, and S/P) for all stocks generally decrease. Hence, spreads based on differences will be compressed. Ratios make movements in the valuation spread less sensitive to overall market moves and more representative of relative performance between value versus growth stocks.

Exhibit 4 presents summary statistics for the time series of the spreads of E/P, B/P, and S/P between decile 10 (value stocks) and decile 1 (growth stocks). For example, our median value stock's E/P is on average 2.0× our median growth stock's E/P. To put it another way, on average our growth portfolio sells for double the P/E of our value portfolio. Similarly, our median value stock's B/P is on average 4.1× our median growth stock's B/P, and our median value stock's S/P is on average 5.4× our median growth stock's S/P.

Note, as one would expect, the minimum spread demonstrates that on each measure the median

**EXHIBIT 4**  
**SUMMARY STATISTICS FOR VALUE SPREADS**  
**VALUE (DECILE 10) ÷ GROWTH (DECILE 1)**  
**FOR E/P, B/P, AND S/P**  
**JANUARY 1982-OCTOBER 1999**

	E/P Spread	B/P Spread	S/P Spread
Average	2.0×	4.1×	5.4×
Std. Dev.	0.3×	0.8×	1.1×
Maximum	3.0×	6.4×	8.5×
Minimum	1.5×	2.7×	3.4×
Current (11/99)	2.9×	5.8×	5.6×

value stock is always cheaper than the median growth stock. The degree to which the median value stock is more attractively priced varies substantially through time, and it is this variation that we seek to capitalize on to forecast the conditional attractiveness of value versus growth.

Exhibit 5 graphs the E/P, B/P, and S/P spreads through time. While each spread exhibits some degree of idiosyncratic behavior, they all exhibit common trends. Currently, all the spreads are above their long-term averages, and the E/P and B/P spreads are near historic highs.

The second variable we propose to predict the returns of value versus growth is the earnings growth spread. The earnings growth spread is calculated by computing the difference between the expected earnings growth for the median stock in the growth portfolio and the expected earnings growth for the median stock in the value portfolio. Since the expected earnings growth spread is unaffected by the level of market prices, and since it is plausible that the expected earnings growth on the value portfolio is occasionally near zero, we use the difference instead of the ratio.

On average, our median growth stock's expected long-term earnings growth is 8.4% higher than the median value stock's expected earnings growth. As we discuss above, this is not surprising, as value stocks tend to be distressed companies, while growth stocks tend to be market darlings.

Exhibit 6 shows that, as expected, the median value stock's expected earnings growth never exceeds the median growth stock's expected earnings growth. Yet the spread varies significantly over time with a maximum of 15.5% and a minimum of 3.9%.

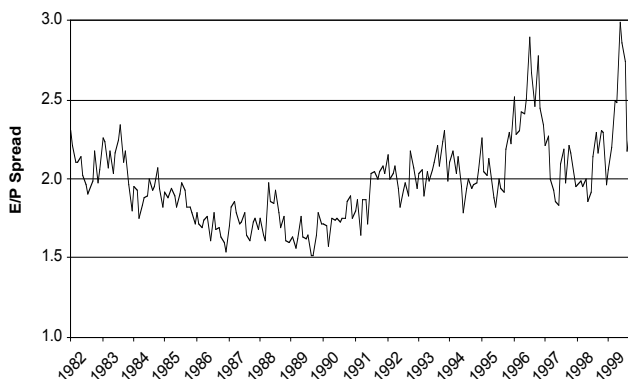
Notice the sharp drop in the earnings growth spread in October 1998. Following the market turmoil from July through September (the portfolios are rebalanced each calendar quarter-end), there was very large turnover in decile 10 and decile 1. In other words, there was a large change in the composition of value and growth stocks as defined by our aggregate industry-adjusted value measure.<sup>10</sup> Furthermore, the sharp decline in the earnings growth spread is mainly due to this significant portfolio turnover rather than changes in analyst growth estimates.

The result is that the median consensus estimate of long-term earnings growth for growth stocks drops by 4% while that for value stocks actually increases by 1.5%.

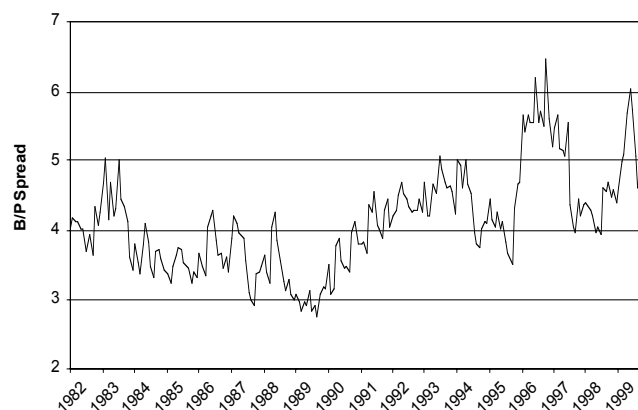
Exhibit 7 graphs the standardized composite value spread and standardized earnings growth spread (i.e., both

# **EXHIBIT 5** **VALUE (DECILE 10) ÷ GROWTH (DECILE 1)** **JANUARY 1982-OCTOBER 1999**

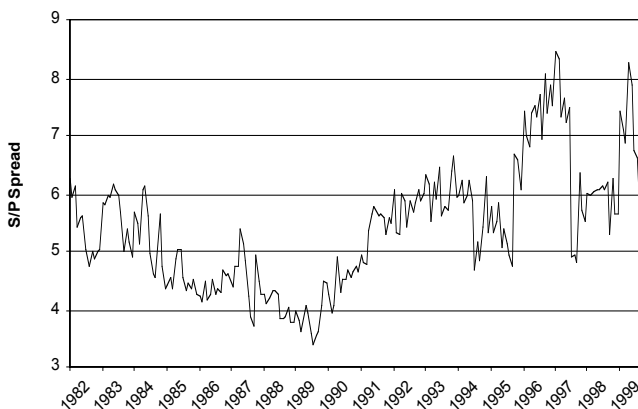
## **PANEL A. E/P SPREAD**



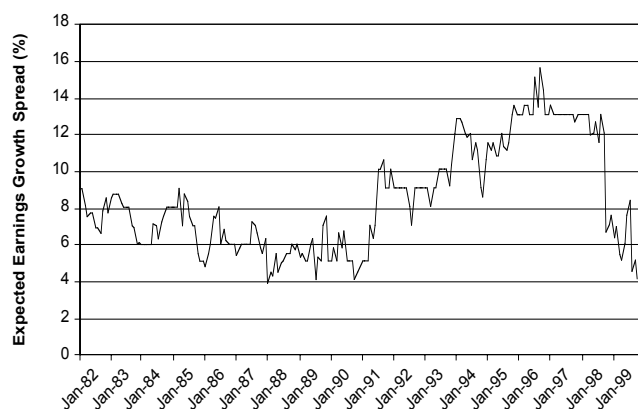
## **PANEL B. B/P SPREAD**



## **PANEL C. S/P SPREAD**



**EXHIBIT 6**  
**EXPECTED LONG-TERM EARNINGS GROWTH**  
**SPREAD — GROWTH (DECILE 1) MINUS**  
**VALUE (DECILE 10)**  
**JANUARY 1982-OCTOBER 1999**

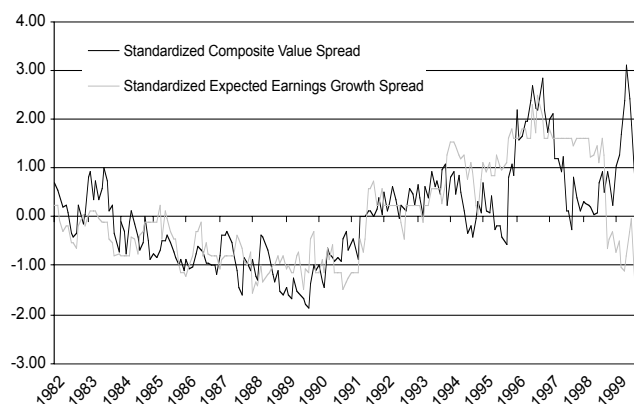


series are standardized to have a mean of zero and a standard deviation of one through time). Recall that our composite value spread is a standardized average of the value spreads for each of E/P, B/P, and S/P. The correlation between the two spreads is 0.62. When value spreads are wider than normal (i.e., value stocks look abnormally cheap relative to growth stocks), growth spreads tend to be wider than normal (i.e., growth stocks have abnormally high expected growth relative to value stocks).

An important implication of this strong positive correlation is that the value spread alone is not a sufficient indicator of the attractiveness of value strategies. In general, when value stocks are priced more cheaply than average compared to growth stocks, they are also giving up more expected earnings growth than normal. Going back to the Gordon model, if wide value spreads are driven only by big differences between the expected earnings growth of growth stocks versus value stocks, then there could be no abnormal expected return advantage to value versus growth.

Exhibit 8 presents predictive regressions of the next twelve-month rolling return of the composite value strategy (return on value stocks minus return on growth stocks from Exhibit 3) on each of the three individual value spreads (E/P, B/P, and S/P) and on the composite value spread, each with and without the standardized earnings growth spread. The fact that each explanatory variable is standardized makes the regression coefficients directly comparable. Each row represents a separate lin-

**EXHIBIT 7**  
**STANDARDIZED COMPOSITE VALUE SPREAD**  
**AND EXPECTED EARNINGS GROWTH SPREAD**  
**JANUARY 1982-OCTOBER 1999**



ear regression. We present the R-squares and coefficients (with the t-statistics in parentheses).<sup>11</sup>

Regressions (1)–(4) show that all four of the value spreads alone do a pretty good job of predicting future returns to the value strategy. Regardless of the earnings growth spread, when value spreads are wider than normal, the expected return to value stocks versus growth stock is generally higher than normal. In particular, the composite value spread alone is significantly positively related to future value versus growth returns (t-statistic of 2.47), and explains almost 23% of the future annual return variation.

Regression (5) shows that the earnings growth spread alone predicts very little of next year's value returns. The coefficient on the earnings growth spread is actually positive. That is, when the earnings growth spread is wider, the expected return for value is higher. This result appears to contradict the prediction in Equation (4), which suggests a negative relation. Exhibit 7, however, shows that the earnings growth spread is strongly positively related to the value spread. When the earnings growth spread is wide, this tends to be when the value spread is wide. Thus, the positive relation between the earnings growth spread and next year's value versus growth return is spurious and due to the strong positive relation between the value spread and next year's returns to value versus growth.

Regressions (6)–(9) show that when the earnings growth spread is combined with any of the value spreads,



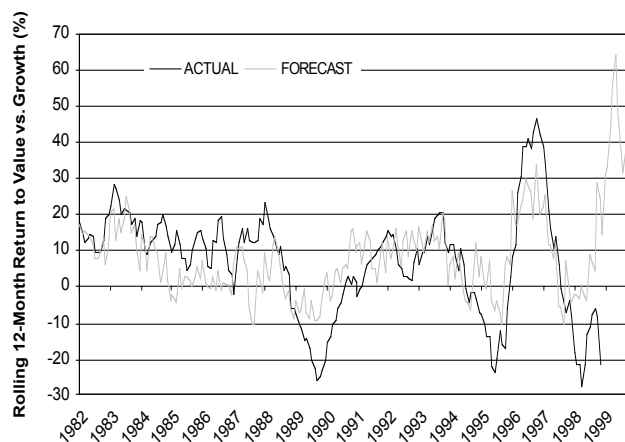
**EXHIBIT 8**  
**PREDICTIVE REGRESSIONS OF ANNUAL VALUE STRATEGY RETURNS**  
**ON VALUE SPREADS AND EARNINGS GROWTH SPREADS**  
**JANUARY 1982-OCTOBER 1999**

	Constant	Value Spread	Earnings Growth Spread	Adjusted R-Square
1. B/P Only	7.12 (2.19)	7.57 (2.72)		24.6%
2. E/P Only	7.23 (2.18)	7.36 (2.28)		19.5%
3. S/P Only	6.98 (2.09)	6.44 (2.04)		17.4%
4. Composite Value Only	7.18 (2.17)	7.58 (2.47)		22.8%
5. Earnings Growth Only	6.45 (1.80)		1.84 (0.45)	1.1%
6. B/P with Earnings Growth	7.92 (3.03)	13.43 (4.17)	-7.57 (-2.67)	35.4%
7. E/P with Earnings Growth	7.87 (2.79)	11.57 (5.77)	-5.37 (-2.37)	26.0%
8. S/P with Earnings Growth	7.69 (2.79)	12.07 (4.24)	-7.05 (-3.01)	26.6%
9. Composite Value with Earnings Growth	8.29 (3.26)	15.52 (5.13)	-9.48 (-4.49)	38.7%

there is a great improvement in the ability to forecast next year's return to value compared to using the value spread alone. In particular, the composite value spread combined with the earnings growth spread explains about 39% of the variability in next year's value versus growth returns. The coefficient on the earnings growth spread is now strongly negative as expected, and the coefficients on the value spreads are higher than those in regressions (1)–(4). Thus, when the value spread is wide (i.e., value stocks look abnormally cheap compared to growth stocks), and the earnings growth spread is small (i.e., the expected earnings growth advantage for growth stocks versus value stocks is smaller than normal), this is a very good time for value.

How good is a 38.7% adjusted R-square model? Exhibit 9 plots the fitted values from regression (9) against the actual twelve-month future return to value versus growth from January 1982 to November 1999.<sup>12</sup> The graph of the actual next twelve-month returns ends in November 1998 (which represents the twelve-month value return from November 1998 through October 1999).

**EXHIBIT 9**  
**ACTUAL AND PREDICTED**  
**TWELVE-MONTH RETURNS OF**  
**VALUE VERSUS GROWTH**  
**JANUARY 1982-NOVEMBER 1999**



The model is clearly not perfect, and the forecast errors can be great (as they have been for the last year), but the model does correctly forecast most of the major moves.

## CURRENT FORECASTS

If we have built a good model, it is of course particularly interesting to observe its current forecast. At the time of this writing (end of October 1999), the model forecasts a 52% return spread (3.6 standard deviations above the historical average) between value and growth over the coming year. Clearly, this is near historic highs for value versus growth.

Historically, the median growth stock on average sells for 2.0 $\times$ , 4.1 $\times$ , and 5.4 $\times$  the median value stock respectively on P/E, P/B, and P/S. Yet the current situation is far from average. The median growth stock now sells for 2.9 $\times$ , 5.8 $\times$ , and 5.6 $\times$  the median value stock. This leads to a composite value spread that is quite high by historical standards (2.1 standard deviations above the average).

Typically, wide value spreads are accompanied by wide growth spreads (recall the two variables have a 0.62 historical correlation). This is not the case now. Historically, the median growth stock is expected to outgrow the median value stock by an average of 8.4% per year. Currently, it is expected to outgrow by only 5.0% per year (1.2 standard deviations below the average). While growth stocks still have higher expected earnings growth than value stocks, the differential is now significantly less than average. Thus, according to our simple model, we have the best of all worlds for value stocks going forward.

We should point out again that the version of value defined here is not necessarily the same as some popular conceptions of value (e.g., S&P/BARRA and Frank Russell). For instance, the beta-adjusted correlation between the returns on our long/short value minus growth portfolio and our proxy for the S&P/BARRA value minus growth portfolio is 0.48.<sup>13</sup> The performance difference is also significant, considering that the beta-adjusted S&P/BARRA value minus growth portfolio has realized only a 0.08 Sharpe ratio over the January 1982 through October 1999 period, while our value strategy realizes a 0.58 Sharpe ratio. Clearly they are related, but they do not capture the exact same phenomenon.

As we say earlier, we feel that using a composite of industry-adjusted valuation indicators creates a far more robust, higher Sharpe ratio strategy. Obviously our model

and our currently very optimistic forecast apply most strongly to a value manager who uses a similar approach (i.e., seeking value without strong industry biases and using a diversified set of indicators).

## CONCLUSION

Expected return premiums can vary through time as a consequence of rational or irrational forces. Rational forces can be either variation through time in the risk of value stocks versus growth stocks, or variation through time in the amount people must be paid to bear this risk. Certainly, the tough recent performance of value strategies has squeezed out many weak hands, and only the strongest advocates may be left. Anecdotally, it would not be surprising if at times like this investors would require greater compensation for bearing value versus growth risk.

Irrational forces could be simply a mispricing between value and growth stocks and time variation in the relative degree of mispricing. Our model's current positive forecast for value could simply reflect an irrational mania — growth at a reasonable price has become growth at any price. Some have conjectured that value strategies have been harmed by a disconnect in the LBO process in that low-grade bond yields are currently very high relative to Treasuries, making it difficult to “unlock” the value in undervalued companies. While this might be plausible, it begs the question of why value was such an effective strategy for years before the low-grade bond market became important.

The recent performance of value strategies, and other historical bear markets for value, clearly shows that value can lose to growth for prolonged periods of time. “The world has changed!” is a common cry heard from those skeptical of value strategies, especially after these rough periods. Today, new technology, globalization, and newly established franchise values, among many other factors, may allow some companies to grow earnings far in excess of and longer than what the market has seen in the past.

We propose a simple model that explicitly seeks to capture this sentiment through Wall Street analysts' forecasts of long-term earnings. We find evidence that suggests that this model can forecast the returns to value versus growth. Moreover, its forecasting power is strong from both a statistical and an economic perspective; it currently forecasts near-historic highs in the expected one-year return of value stocks versus growth stocks.

According to this model, value is very far from dead.

## ENDNOTES

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<sup>1</sup>Fan [1995] proposes the P/E spread as a predictor of value versus growth in tests based on the S&P/BARRA value and growth indexes. He finds only a weak predictive relation between the P/E spread and future returns. Our work continues along this line, but also incorporates the earnings growth spread and uses spreads in valuation measures based on ratios rather than straight differences to remove the influence of the overall market's valuation. Additionally, we focus on value strategies that are industry-adjusted and diversified across several indicators. Asness, Porter, and Stevens [1999] show that value strategies are significantly more effective on an industry-adjusted basis. The S&P/BARRA indexes are constructed using raw book-to-price and thus incorporate significant industry biases. Our results suggest that industry adjustment, using ratios of valuation indicators rather than differences, and incorporation of the earnings growth spread produce significantly stronger predictive relations.

<sup>2</sup>The Gordon model refers to earnings (or free cash flow) that are not reinvested to generate future earnings (i.e., dividends or potential dividends). We employ a more general version of valuation that includes earnings-to-price, book-to-price, and sales-to-price. The results are not sensitive to differences in the specification of value.

<sup>3</sup>Note that all Compustat accounting data are lagged a minimum of six months to minimize the possible effect of look-ahead bias on our value measures. Lagging the data by six months actually generates between six- and eighteen-month lags, depending on the time of year and the month of the fiscal year-end. For example, the value indicators for a stock with a December fiscal year-end will use the December fiscal year-end data (time  $t$ ) for the twelve months July (time  $t + 6$ ) through June (time  $t + 18$ ). Thus, the accounting data lag varies from six to eighteen months.

<sup>4</sup>Additionally, for each stock we require a return to exist in the subsequent month; we exclude ADRs and Internet stocks; and we include only U.S. domiciled stocks (including financials). Internet stocks are excluded for reasons of severe data limitations (such as negative earnings and book value) and to avoid potential biases in the current forecast, as Internet stocks are a very new phenomenon.

If we restrict the universe to the S&P 500, the style timing results, while somewhat weaker (as would be expected due to the much smaller cross-section of stocks), are still statistically and economically significant.

<sup>5</sup>Our industry classification is based on the historical BARRA USE3 risk model, which provides industry classifications for each stock into up to five different industries. We assign each stock in our universe to its most important BARRA industry.

<sup>6</sup>The industry averages are calculated using a 50/50 blend of the equal-weighted and market capitalization-weighted average. This combination reduces the problem that a few very large stocks

can overly influence the industry averages when using market capitalization weights, and mitigates the problem of overweighting small stocks when using equal weights. In addition, to limit the weight of outliers, the lowest and highest 0.5% of the observations of each raw value variable are set to the next lowest or highest value prior to calculating the industry averages. The results are not sensitive to these choices.

<sup>7</sup>An equal-weight index also shows a very pronounced, but smaller, recent increase.

<sup>8</sup>If, instead of equal weights within decile 1 and 10, we weight by market capitalization, the style timing results are somewhat weaker, but are all still statistically and economically significant.

Note that quarterly rebalancing mitigates the effects of short-term return reversal that can upwardly bias the value strategy returns. Since the price at time  $t$  is used in the denominator for each accounting ratio, recent bad performance will bias a stock's valuation measure upward, and to the extent that returns reverse, will bias the value strategy returns upward. Some of the observed short-term return reversal can be attributed to bid-ask effects. Thus, the achievable performance of value strategies can be overstated if one employs a monthly rebalancing strategy. We find that monthly rebalancing produces annual Sharpe ratios that can be as much as 50% higher than quarterly rebalancing.

<sup>9</sup>Technically, the E/P ratio can be less than one since we form our value portfolio using a combination of valuation factors. Practically, because of the high correlation among the three value variables, this never occurs.

<sup>10</sup>The sharp drop is not specific to our choice of using decile sorts to create our value and growth portfolios. If we use quintiles instead of deciles, we see a similar decline.

<sup>11</sup>Since the regressions employ overlapping annual returns, the residuals will be serially correlated. Hence, the  $t$ -statistics are adjusted for serial autocorrelation of a general MA (11) form.

<sup>12</sup>The forecast for November 1999 is based on the regression coefficients and updated composite value and earnings growth spreads.

<sup>13</sup>We form proxies for the S&P/BARRA value and growth indexes by employing a very similar methodology to that used for the actual index construction. Over the overlapping period (October 1993 to October 1999), our versions of S&P/BARRA value and growth are 0.992 and 0.990 correlated to the actual indexes, respectively.

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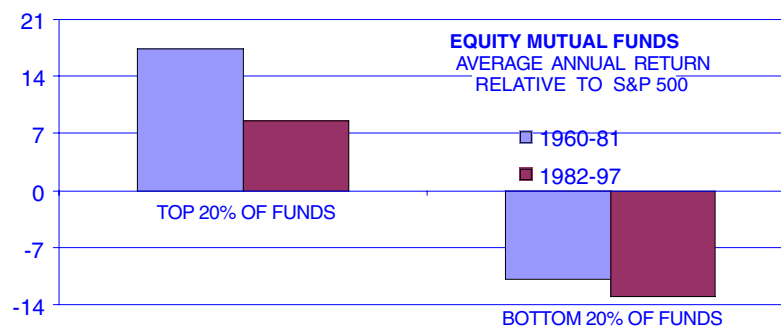
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## ERRATUM

This is a correction to the exhibit from the article "Levels of the Game," by Charles D. Ellis in the Winter 2000 issue.

### EXHIBIT BEATING THE MARKET HAS BECOME HARDER



Data: Lipper Analytical Services, Peter L. Bernstein.