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The reliability of the book-to-market ratio as a risk proxy

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Abstract

This study examines whether the book-to-market ratio consistently explains the cross-section of stock returns through time. The results reveal that the book-to-market ratio is positively and significantly related to return in only 43% of the monthly regressions. Other value/growth variables such as Cash Flow," "Sales Growth," and "Size"; perform even more erratically than the book-to-market ratio, and are thus less likely to be viewed as legitimate risk proxies. © 2001 Elsevier Science Inc. All rights reserved.

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1. Introduction

A particular investment strategy or style is often followed by investors forming actively managed portfolios. In recent years, the "value style" investment strategy has generated considerable interest and debate. Many investment advisors and a number of academics advocate investing in "value firms" that are considered to be relatively un-popular. These firms have high book equity-to-market equity ratios (BE/ME), high cash flows, and low sales growth rates. Value firms appear to earn much higher long-term returns than those with low BE/ME, low cash flows, and high sales growth rates. Of potential interest to investors is whether they can use a value strategy over a short-term horizon and still expect to earn superior returns on a consistent basis, as the literature seems to indicate.

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The value effect may not be consistently dependable thus causing professional portfolio managers to avoid investing in these securities. Under this scenario these managers will avoid buying extreme value firms due to the risk of short-term underperformance. Even for individual investors who do not have to worry about capital flight from their portfolios, a series of monthly returns with low performance may be enough to cause them to jettison this strategy. If short-term returns are not reliable, only individual investors with a long-term focus may be able to withstand short-term performance setbacks or reverses and invest consistently in the most unpopular securities.

This study examines whether the book equity-to-market equity ratio and other value/growth variables predict returns consistently from 1963 to 1997 using monthly intervals. Can the individual investor using a value investment strategy expect at any point in time to outperform a growth strategy over subsequent months? Average returns are reported over long intervals as in other studies. Subperiods are then examined over ten-year, five-year, and one-year periods. The study documents the dependability of returns, or the lack thereof, for value firms, and also indicates whether BE/ME or some competing variable captures the most variation in return.

The paper is organized as follows: In Section 2 a review of the background literature is undertaken. Data specifications and issues are presented in Section 3. Empirical test results for competing univariate variables are displayed in Section 4. Subperiod results for five and ten-year periods are analyzed in Section 5. Monthly regression coefficients averaged on a yearly basis are displayed in Section 6. A summary of the findings may be found in Section 7.

2. Literature foundations

Fama and French (1992, 1993, 1995) have contributed to the popularity of the BE/ME variable for predicting stock returns. The strength of this variable allows it to act as the central factor in their asset-pricing model. Other authors have also found a significant positive correlation between BE/ME ratios and the cross-section of stock returns including Stattman (1980), Rosenberg, Reid, and Lanstein (1985), Chan, Hamao, and Lakonishok (1991, 1993), Capaul, Rowley, and Sharpe (1993), Lakonishok, Shleifer, and Vishny (1994), Davis (1994), and Chan, Karceski, and Lakonishok (1998).

Fama and French (1992) interpret BE/ME as a proxy for risk. Fama and French (1995) provide evidence, which indicates that high BE/ME firms have a degree of financial distress via depressed earnings. Their perspective is that high BE/ME firms have both high risk and high return levels. Thus, the market appears to behave efficiently.

Lakonishok et al. (1994), and Haugen and Baker (1996), provide a competing explanation and suggest that the relationship is caused by inefficient markets and investor overreaction. Their position is that investors bid “growth” firm prices up too far, causing high market values and extremely low BE/ME ratios but they bid the price of “value” firms down too low causing high BE/ME ratios.

BE/ME, cash flow, and sales growth variables are considered alternative variables for categorizing value/growth firms by Lakonishok et al. (1994). High BE/ME, high cash flow, and low sales growth firms are labeled as “value” firms. They find that cash flow yield and sales growth

variables capture larger average premiums than BE/ME and size in one-to-five year holding periods. Davis (1994) on the other hand does not find a significant sales growth variable.

Some recent research tends not to support the risk proxy theory, although it is unresolved as to whether the premium captured by BE/ME is due to an unknown source of risk or due to market inefficiencies. Daniel and Titman (1997) find no evidence for a distress factor. La Porta, Lakonishok, Shleifer, and Vishny (1997) find that much of the difference in returns between value and growth firms can be attributed to relatively larger positive earning surprises for value stocks. This finding tends to support the investor overreaction theory rather than a risk based explanation. Dechow and Sloan (1997) counter the overreaction literature by showing that prices are affected by misplaced investor belief in biased analyst forecasts. Whether these biased forecasts contribute to a risk based explanation is yet to be determined.

Loughran (1997) and Loughran and Ritter (2000) call into question the usefulness of the BE/ME effect altogether. Loughran (1997) examines the book-to-market effect in detail by firm size, exchange listing, and calendar seasonality and concludes that the Fama and French findings are driven by the January effect and low returns on small, young, growth stocks. He finds that book-to-market has no explanatory effect in the largest size quintile, which has 73% of the market capitalization. He assumes that the effect is not useful for professional investors who must take into consideration other factors such as liquidity when forming portfolios and investment strategies. He uses this argument to explain why value fund and growth fund manager performance is so comparable as in Malkiel (1995).

Lakonishok, Shleifer, and Vishney (1994), and Haugen (1995) give a different rationale as to why fund managers may avoid investing in value firms on the extreme end of the continuum. They reason that professional money managers cannot risk having a portfolio that substantially underperforms the market even on a short-term basis because performance is measured and rewarded monthly or quarterly. Haugen (1995) claims that the value effect is a “Golden Opportunity” for individual investors who can continue to earn above normal long-term returns. He suggests that the effect should continue to persist because of the potential short-term uncertainty in returns which drives away the professional managers.

Dhatt, Kim, and Mukherji (1999) present findings that partly disagree with Loughran’s (1997) premise. They show that an exploitable value premium exists for stocks in the Russell 2000 index in general, and for liquid stocks other than the smallest size quintile in particular. Furthermore they document a value premium outside of January. This finding is consistent with the findings of Loughran (1997) for NASDAQ and AMEX stocks but not for NYSE firms.

Chan et al. (1998) document strong size, BE/ME, and dividend yield comovements in stock returns. In addition to the most widely used fundamental factors, they also examine a number of competing macroeconomic, statistical, and technical factors as well as an overall market factor. They do not examine the sales growth variable among their other factors. Chan et al. (1998) also point out that comovement in returns is not the same as a priced factor in returns. For example, their strongest fundamental factor, the size variable, tends to load on large firms part of the time and then switches over to small firms. This causes the size factor to provide the highest variation among fundamental factors over time. Their findings do not directly contribute to a further understanding of whether these factors are risk based or

caused by behavioral aberrations, but they do provide information on which variables generate the largest variation in returns.

In the following report, an examination of the short-term nature of the value effect provides evidence concerning the usefulness of the strategy, and also contributes new information to the risk-proxy versus overreaction debate. In constructing the study three issues are taken into account. First, can the long term returns documented in the above studies, be consistently captured on a short-term basis? If so, then money managers would be expected to participate if Loughran's (1997) liquidity theory is not applicable. If not, then this may explain why managers avoid these securities. Second, does the BE/ME variable do the best job of predicting return, or are there better alternative value/growth variables? And third, when the results are known do they support the risk proxy theory or the investor overreaction explanation?

In an efficient market one would expect that risk and return would be highly related on a reliable basis through time. Any useful risk proxy will be expected to explain variation in return on a consistent basis. If instead the relationship between the risk proxy and return is not reliable through time, it can be argued that the superior returns are generated during some time periods because of investor overreaction or by chance rather than because of risk. Or, one may argue that markets are efficient only part of the time.

3. Data and empirical design

All firms on NYSE, AMEX, and NASDAQ are included in the study if they meet other data requirements described below. In this study the emphasis is on short-term performance of the value effect, and its reliability through time. Stock return is used as the dependent variable in monthly regressions as in Fama and French (1992). The independent variables are drawn from the pool of value/growth variables discussed in the literature. The composition of these variables is discussed below. Seven additional years of data are included beyond the years examined by Fama and French (1992) providing return data from July 1963 to December 1997.

Accounting variables for use in this study are taken from fiscal year-end in calendar year t-1. For example, the accounting data for book equity is gathered from the COMPUSTAT active and research files starting with December 1962 and ending with December 1996. Market value of equity is taken at the end of June in year t and comes from the CRSP files. The accounting data are taken in year t-1 to explain returns for each month starting in July of year t to June of year t+1. Daily return data are compounded to form monthly returns as in Loughran (1997).

A company must have a CRSP stock price for December of year t-1 and June of year t to be included in the study. The company must have monthly returns for at least 24 of the 60 months prior to July of year t. Each company must have book equity for its fiscal year (ending in any month) of calendar year t-1. These restrictions, imposed by Fama and French, are followed in this study.

An additional restriction is added for convenience in comparing studies. A firm must have sales in at least two adjacent years during the five years preceding year t in order to calculate sales growth rates. The firm must also record earnings.

Table 1
Variable descriptions

Variable name	Variable description
Ln(BE/ME)	Book equity (BE) is COMPUSTAT data item # 60. This includes common stock outstanding, capital surplus, and retained earnings. Market Equity (ME) is reported on the last trade date in December and consists of COMPUSTAT item #24* #25 (Shares outstanding * price)
Cash flow	Earnings before extraordinary items (data item # 18) plus depreciation (item # 14) all divided by market value.
Cash flow deciles or (CFDecile)	The raw cash flows above are sorted into deciles and assigned a 1.0 for the lowest cash flow firms, a 2.0 for the next lowest decile, and so on up to a 10 for the highest cash flow firms.
WGS	Weighted growth in sales over the last five years if available. (30% weighting to the most recent year, 25% for the next most recent year down to 10% for the fifth year). If there are less than five years the weights are adjusted to add up to 100%.
WGS deciles	WGS sorted into decile portfolios and assigned a rank from 1 to 10 from lowest to highest growth.
Ln(WGS)	The natural log of WGS deciles.
Ln(ME)	The natural log of June ending market value denominated in millions of dollars. Market equity (ME) for the "size" variable is taken from CRSP. The most recent reported shares outstanding are multiplied with the price reported on the last trade date of June in year t.

Listed below in Table 1 are variable descriptions and brief explanations as needed. One major dilemma deals with firms that exhibit negative cash flows. For most of this study, negative cash flow firms are assumed to be most similar to growth firms and assigned a rank of 1 in the cash flow decile variable described in Table 1. Negative cash flow firms are included so as to maintain as large a data set as possible. Including negative cash flow firms in the data set creates the strongest and most significant results for the BE/ME variable. Alternate regressions were also run using only positive cash flow firms and a negative cash flow dummy. Another test was conducted assuming negative cash flow firms to be most like "value firms." Negative book equity firms are not included in the regressions. So, negative cash flow firms included in the data set are more apt to be temporarily depressed, or very rapid growth firms using more resources than are generated internally.

Another data issue involves the form of the sales growth variable that is most effective. Anthony and Ramesh (1992) use a median sales growth (MGS) variable while Lakonishok et al. (1994) use both equal weighting sales growth and weighted sales growth procedures. A weighted sales growth variable is primarily used in this study (see Table 1) but other forms of the variable are also tested.

4. Empirical results for competing univariate variables

The focus of this section is on statistically significant "value/growth" variables in monthly regressions, and whether these variables are reliable or dependable through time. Table 2 summarizes monthly regression results for single variable models including book-to-market,

Table 2
Average slopes from month-by-month regressions of stock return on variables of interest July 1963 to December 1997

Variable	Coefficient mean	T statistic	P value	Number sign pos months	Numbers sign neg months
LN(BE/ME)	0.48%	6.07	0.000*	178	76
CASHFLOW DECILES	0.11%	5.59	0.000*	168	77
LN(WGS)	−0.21%	−3.80	0.000*	64	126
LN(ME)	−0.14%	−3.11	0.002*	131	167

Each variable is formed as described in Table 1. The coefficient mean (or average slope) is the average regression coefficient taken from 414 monthly regressions that start in July 1963 and proceed to December 1997. The T-statistics and P values are taken from single sample t-tests in which the time series of the regression coefficient is tested for the hypothesis that the mean is not different than zero. Asterisks found next to individual P values highlight significance levels at 5% or lower. In addition, the number of significant positive and negative (5% level) monthly regression coefficients are recorded.

size, sales growth, and cash flow. The coefficient mean (or average slope) for each variable is the time series average of the regression coefficients taken from 414 monthly regressions that start in July 1963 and proceed to December 1997. These coefficients vary over the 34.5-year period but on an average explain a statistically significant portion of the variation in return.

All the variables are significant and have signs that correspond with the results from earlier studies. Ln(BE/ME) and cash flow variables are positively related to return while size and sales growth variables are negatively correlated with return. The strongest variables are ln(BE/ME) and cash flow deciles. The next strongest variables are the natural log of weighted sales growth, and size. Of all the variables analyzed in a univariate fashion, ln(Be/ME) has the highest significance level, but only fractionally higher than cash flow deciles.

Examination of each individual monthly regression, reveals that ln(BE/ME) has more significant monthly regressions of the appropriate sign than any other variable in the study. Out of a universe of 414 monthly regressions, 43.0% are significantly positive while only 18.4% work in the opposite direction. Thirty-nine percentage (38.6%) of the monthly regression coefficients cannot be established as different from zero.

The cash flow decile variable has fewer statistically positive monthly regression coefficients than ln(BE/ME), and about the same number of months where the results move in the wrong direction (40.6% positive, 18.6% negative, and 40.8% inconclusive). For ln(WGS) 30.4% have significant negative monthly coefficients, while 15.5% of the months perform contrary to expectations. Over half the monthly regressions coefficients (54.1%) are insignificant. For ln(ME) similar percentages are 40.3% significantly negative, 31.6% significantly positive, and 28% inconclusive.

On the univariate level the results indicate that ln(BE/ME) would probably be the most effective predictor of return over time due to its more consistent relationship with return. In this context there is no one unique definition of reliability. What is meant by reliability for a variable, is that it is statistically significant with the proper sign for the period of

examination, and that it correctly predicts returns in more than 50% of the time periods. The position taken in this paper holds that a strategy is not considered reliable if it captures variation in return less than 50% of the time. Clearly, if one accepts this definition of reliability, the value effect as captured by BE/ME is unreliable.

When examining the value effect using alternative risk proxies the level of reliability will have some impact on the explanation as to whether the effect is caused by investor overreaction or is based on risk. Risk can change through time, but in the long tradition of the capital asset pricing model, it may be assumed that a risk proxy should consistently differentiate differences in risk to the exclusion of other nonrisk based factors. If on the other hand, investor overreaction or fad investing is driving returns, it may well be that a particular strategy's performance is cyclical through time.

Since a risk proxy benchmark for reliability has not been established in the literature, the best that can be done is to present statistics that are useful for comparison. Each individual investor, depending upon his or her level of risk aversion, can determine whether the strategy warrants usage. Each individual will determine a minimum level of reliability and choose strategies accordingly.

5. Subperiod results - time consistency

An analysis of subperiod results for each model is useful in answering the following questions. Do the large average returns garnered from contrarian or risk proxy strategies derive from consistent common stock return behavior? Or, are the results due to a few exceptional months or years? Table 3 casts light on the issue by dividing the data into ten-year subperiods.

In Table 3 the first 360 months of the study period is divided into three 120-month intervals. The last two columns present the most recent 20–1/2 years providing a different time period view. This view avoids the possibility that inclusion of NASDAQ firms from the early 70's is somehow altering the results. Some overlap in time periods occurs due to this added view.

With a ten-year horizon each of the models presented exhibit statistically significant results as expected for the majority of the study period except for the size variable. Ln(ME) is significant in only two time periods examined, and these two periods have some overlap between 1977 and 1983. The sales growth variable is not significant in the earliest time period between July 1963 and June 1973.

During one of the ten-year periods, the BE/ME variable exceeds the 50% reliability rule that is introduced in the last section. Between July 1977 and June 1987 BE/ME is significantly related to return in 53% of the monthly regressions. Other time periods and other variables do not accomplish this distinction except for the size variable in the period of July 1973 to June 1983. It appears that the value effect is an unreliable predictor of return even though it is significantly related to return on average over 10 year periods.

Ln(BE/ME) is a significant variable in each of the ten-year periods, though over half the monthly regression coefficients are not positive for three of the time periods examined.

Table 3
Average slopes from month-by-month regressions of stock return on variables of interest: ten year sub-period results

	July 1963 to June 1973	July 1973 to June 1983	July 1983 to June 1993	July 1977 to June 1987	July 1987 to Dec 1997
LN(BE/ME)					
Coef. Mean	0.34%	0.52%	0.54%	0.49%	0.48%
T Statistic	2.29	2.69	5.44	3.86	5.28
P Value	0.024*	0.008*	0.000*	0.000*	0.000*
% Sign Pos	31%	46%	50%	53%	45%
% Sign Neg	19%	25%	13%	22%	13%
CFDECILE					
Coef. Mean	0.10%	0.09%	0.12%	0.13%	0.07%
T Statistic	3.26	2.48	3.59	4.34	1.97
P Value	0.001*	0.015*	0.000*	0.000*	0.052
% Sign Pos	31%	41%	48%	48%	43%
% Sign Neg	15%	17%	18%	18%	26%
LN(WGS)					
Coef. Mean	−0.01%	−0.36%	−0.24%	−0.28%	−0.21%
T Statistic	−0.10	−3.28	−2.36	−2.98	−2.19
P Value	0.918	0.001*	0.020*	0.003*	0.030*
% Sign Pos	12%	20%	18%	19%	17%
% Sign Neg	18%	38%	35%	38%	32%
LN(ME)					
Coef. Mean	−0.12%	−0.32%	−0.01%	−0.14%	−0.10%
T Statistic	−1.43	−3.39	−0.10	−2.04	−1.31
P Value	0.157	0.001*	0.923	0.043*	0.192
% Sign Pos	27%	28%	37%	33%	35%
% Sign Neg	29%	53%	38%	46%	45%

Each variable is formed as described in Table 1. The coefficient mean (or average slope) is the average regression coefficient taken from the 120 monthly regressions for each ten-year period. The T-statistics and P values are taken from single sample t-tests in which the time series of the regression coefficient is tested for the hypothesis that the mean is not different than zero. In addition, the percentage of significant positive and negative (5% level) monthly regression coefficients are recorded.

Likewise the cash flow decile variable is significant in most of the ten-year periods, though the percentage of positive coefficients never exceeds 48%.

The results found in subperiod analysis reveals that patience is a key attribute when any of these strategies are used as an investment rule. Over longer-time horizons such as the ten-year periods shown in Table 3, average premiums on ln(BE/ME) are statistically significant and positive. This is not the case for certain shorter horizons as in the five-year subperiods shown in Table 4. Wide variation in the strength of each model is evident. The coefficient mean in the first five years is ten times larger than the following five years. The coefficient mean in the third five-year period is over 13 times as large as the second period and over three times as large as the fourth. It is evident that an investor following a value strategy, will have to weather many months of negative or insignificant return performance to capture a large positive average value premium.

Table 4
Average slopes from month-by-month regressions of stock returns on variables of interest—five year sub-periods

	7/63 to 6/68	7/68 to 6/73	7/73 to 6/78	7/78 to 6/83	7/83 to 6/88	7/88 to 6/93	7/93 to 12/97
LN(BE/ME)							
Coef. Mean	0.62%	0.06%	0.79%	0.26%	0.67%	0.40%	0.54%
T Statistic	2.71	0.32	2.42	1.23	4.71	2.97	4.02
P Value	0.009*	0.749	0.019*	0.225	0.000*	0.004*	0.000*
% Sign Pos	33%	28%	47%	45%	60%	40%	48%
% Sign Neg	12%	27%	18%	32%	12%	15%	13%
CFDECILE							
Coef. Mean	0.15%	0.06%	0.13%	0.06%	0.23%	0.02%	0.10%
T Statistic	3.39	1.28	2.14	1.28	5.42	0.37	1.68
P Value	0.001*	0.206	0.036*	0.207	0.000*	0.713	0.099
% Sign Pos	35%	27%	42%	40%	58%	38%	44%
% Sign Neg	7%	23%	10%	23%	12%	25%	31%
LN(WGS)							
Coef. Mean	0.11%	−0.13%	−0.53%	−0.19%	−0.33%	−0.14%	−0.27%
T Statistic	0.68	−0.91	−3.49	−1.21	−2.59	−0.92	−2.46
P Value	0.499	0.367	0.001*	0.232	0.012*	0.364	0.017*
% Sign Pos	8%	12%	13%	27%	15%	22%	11%
% Sign Neg	12%	23%	40%	37%	40%	30%	31%
LN(ME)							
Coef. Mean	−0.39%	0.14%	−0.38%	−0.26%	0.13%	−0.15%	−0.07%
T Statistic	−3.29	1.25	−2.38	−2.57	1.60	−1.27	−0.71
P Value	0.002*	0.216	0.021*	0.013*	0.115	0.210	0.480
% Sign Pos	12%	42%	25%	30%	45%	28%	41%
% Sign Neg	40%	18%	53%	52%	28%	48%	43%

Each variable is formed as described in Table 1. The coefficient mean (or average slope) is the average regression coefficient taken from the 60 monthly regressions for each five-year period. The T-statistics and P values are taken from single sample t-tests in which the time series of the regression coefficient is tested for the hypothesis that the mean is not different than zero. In addition, the percentage of significant positive and negative (5% level) monthly regression coefficients are recorded.

In five-year periods the findings are ambivalent. Results indicate that even the powerful BE/ME variable is reliably related to return for more than 50% of the months, during only one five-year period. Other value/growth variables are also not reliably related to return. Firm market value for example, is not a good univariate predictor of return for many time periods. It may be that size is randomly unrelated to the other investment strategies and thus provides a degree of diversification benefit when included in multivariate models. Or it may be that the results are simply time period specific. If this is the case, then there is no assurance that size will continue to perform well in the future.

The ideal risk proxy would consistently be related to return in each five-year (or more frequent) period. Cash flow deciles and BE/ME appear to follow the same pattern in returns to some extant. Both variables are significant during the same five-year time spans, except

for the last two time periods from July 1988 to December 1997. During these periods cash flow deciles are not significantly related to return, while the BE/ME variable continues to differentiate between high and low return investments.

The sales growth variable is quite unreliable in short time spans but, like size, this variable may add diversification benefits in multivariate strategies.

6. Monthly regression coefficients averaged on a yearly basis

Individual investors and portfolio managers can never be sure that past patterns in returns will continue in the future. If the value firm effect is based on underlying risk factors, one should expect it to continue. On the other hand if the effect is based upon investor overreaction, than one may expect the effect to phase in and out with investing fads or disappear altogether.

From the information presented in Table 5 it is easy to identify when the variable in question has had periods of failure. Failure entails the average coefficient falling into negative territory for ln(BE/ME) and cash flow deciles. This indicates that growth firms outperformed value firms during this period, contrary to what is expected. Violation of the value firm effect is evident for ln(WGS) and ln(ME) when the average coefficients rise into positive territory. Ln(BE/ME) and cash flow deciles appear to be fairly strong variables over some periods of time on an average basis. Ln(BE/ME) is more reliable than any of the other variables with only four years in which the coefficient drops into negative territory. Cash flow deciles become negative in eight years. Ln(WGS) is positive in eight out of thirty-five years, with several more years very close to zero. Clearly ln(WGS) performs opposite to contrarian strategy predictions during the period before that in which Lakonishok et al. (1994) analyze their results. The variable has performed as expected most of the time in recent years. Ln(ME) has positive coefficients in over one-third of the years. Ln(ME) does not perform well during the mid-eighties in particular.

Table 5 indicates that there are not many years in which the contrarian BE/ME strategy dramatically fails (growth firms earn more on average than value firms). For ln(BE/ME) this occurs between July 1970 and June 1972, July 1979 to June 1980, and July 1989 to June 1990. There are many years where the strategy does not appear to differentiate well between the two styles of investing. During the entire 34.5-year period there are only 16 years (46%) in which 50% or more of the monthly BE/ME coefficients are positive and significant.

7. Summary and interpretation of findings

Evaluation of a value investment strategy reveals that the high returns found over long time horizons are not uniform or dependable over short time intervals. In this study the book equity-to-market equity ratio (BE/ME) is regressed monthly against returns for the years of 1963–1997.

The book-to-market effect (BE/ME) is statistically related to return as predicted in less than 50% of the monthly time periods examined. Also, the variable is not always significant

Table 5
Monthly regression coefficients averaged on a yearly basis

Year	Ln(BE/ME)	Pos/Neg	Cfdecile	Pos/Neg	LN(WGS)	Pos/Neg	LN(ME)	Pos/Neg
1962	0.52%	4,0	0.08%	2,1	−0.42%	0,5	0.11%	3,2
1963	0.17	3,2	0.06	5,1	−0.30	0,1	−0.25	1,5
1964	0.58	6,3	0.27	8,1	0.06	0,0	−0.46	1,7
1965	0.97	4,1	0.17	2,0	0.34	1,0	−0.57	2,4
1966	0.87	3,1	0.17	4,1	0.88	4,1	−0.78	0,6
1967	0.40	5,1	0.12	4,0	−0.34	0,1	0.02	2,2
1968	0.08	4,4	0.09	3,4	−0.41	2,5	0.32	6,2
1969	−0.49	2,4	−0.12	1,5	0.75	4,0	−0.20	4,5
1970	−0.38	1,6	−0.11	0,4	−0.01	1,1	−0.04	5,2
1971	0.68	5,1	0.32	8,1	−0.66	0,7	0.63	8,0
1972	0.46	4,3	0.03	4,1	−0.77	2,6	−0.15	4,4
1973	0.65	6,4	0.03	3,4	−0.55	1,5	−0.35	4,6
1974	1.13	3,3	0.26	6,0	−0.60	1,5	−0.34	5,3
1975	0.84	8,0	0.20	6,0	−0.25	3,4	−0.35	2,7
1976	0.85	7,1	0.11	6,1	−0.49	1,5	−0.70	0,12
1977	0.13	6,4	0.04	3,1	−0.15	4,4	−0.24	4,6
1978	−0.45	1,4	−0.06	2,4	0.30	4,1	−0.05	5,3
1979	0.22	6,5	0.04	6,3	0.11	4,3	−0.39	3,8
1980	1.07	9,2	0.34	10,2	−0.55	2,7	−0.05	4,4
1981	0.31	5,4	−0.07	3,4	−0.66	2,7	−0.57	2,10
1982	1.31	10,1	0.36	9,0	−0.71	1,7	0.12	6,3
1983	0.59	8,2	0.36	9,2	−0.01	2,3	0.34	7,2
1984	0.27	2,0	0.10	4,1	−0.12	1,2	0.15	5,2
1985	0.62	9,3	0.12	6,3	−0.56	2,7	0.00	4,5
1986	0.56	7,1	0.22	7,1	−0.25	3,5	0.05	5,0
1987	0.55	6,1	0.19	7,1	−0.20	1,4	0.08	5,3
1988	−0.21	1,2	0.03	4,4	0.02	2,2	0.11	5,4
1989	0.27	5,3	−0.06	5,4	0.05	5,4	−0.12	3,8
1990	0.64	6,3	−0.14	3,3	−0.32	2,5	−0.47	3,7
1991	0.75	6,0	0.07	4,3	−0.26	3,3	−0.34	1,7
1992	0.86	8,0	0.13	7,2	−0.40	1,3	−0.24	3,7
1993	0.13	5,2	−0.02	3,4	−0.10	1,1	0.00	5,3
1994	0.11	2,2	−0.14	3,7	−0.18	1,5	−0.37	3,8
1995	0.89	8,3	0.35	8,2	−0.24	3,5	0.27	8,2
1996	0.87*	3,0*	0.24*	3,2*	−0.62*	0,3*	0.05*	3,3*

The years represent the "variable" formation period from which accounting data is drawn. The coefficient means represent the average monthly regression coefficient of the variable regressed against stock return, during the period July of year t + 1 to June of year t + 2. For example, the average negative regression coefficient on ln(BE/ME) for 1978 is for the 12-month return period July 1979 to June 1980. * 1996 results are based on returns from July 1997 to December 1997 only. Pos/Neg records the number of statistically significant positive and negative coefficients respectively.

in five-year subperiods. However in ten-year periods BE/ME is significantly related to return. Thus the data supports the view that the BE/ME variable is not a reliable predictor of return over short time horizons. An investor can capture superior returns only if the holding period is extended to cover fairly long intervals.

It is the author's opinion that short term BE/ME unreliability does not negate the usefulness of the value effect for a patient investor as evidenced by the long term positive and statistically significant coefficients presented in this and other studies. But, there is no

certainty that the historical data will predict trends that will persist into the future. The professional investment community may be aware of the "value" effect, but be unwilling to risk the possible short-term underperformance resident in such a strategy. They are more likely to invest in securities more closely aligned with common performance measurements such as the S&P 500 index.

In this study three questions were examined. First, can the long term returns documented in the literature, be consistently captured on a short-term basis? The answer is no, not on a reliable basis through time. Second, does the BE/ME variable do the best job of predicting return, or are there better alternative value/growth variables? Although BE/ME is weak at times, and is positive and statistically significant in only 43% of the monthly regressions, the BE/ME ratio is a more consistent predictor of return than other competing value/growth variables such as cash flow, size, and sales growth. And third, when the results are known do they support the risk proxy theory or the investor overreaction explanation? Because the BE/ME effect is not reliable over short horizons an argument can be made that either the market is not efficient, or that the BE/ME variable is not an adequate proxy for risk.

One would expect a useful risk proxy to be related to return on a reliable basis if markets are efficient. Perhaps there is a consistent relationship between true underlying risk and return through time. As a proxy for risk the BE/ME variable does not adequately predict return on a consistent basis, and so the results of this study do not provide support for the risk proxy theory. Rather, it is plausible that some investor overreaction is behind the positive but variable returns derived from the value effect. Investing fads (value style or growth style) can be expected to come in and out of favor with investors. An investor overreaction story would help explain why the effect is stronger during some time periods than others.

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