Value Stocks and Accounting Screens: Has a Good Rule Gone Bad?

Melissa K. Woodley
Samford University

Steven T. Jones
Samford University

James P. Reburn
Samford University

We find that the financial statement variables identified by Piotriski (2000) no longer distinguish future winners from future losers among those stocks with high book-to-market ratios. While we confirm Piotroski's findings for the 1976-1996 window used for his study, over the ensuing 12 years the results are actually reversed. Specifically, by most measures the stocks of "High F_Score" firms produce returns lower than those of "Low F_Score" firms and lower than those of the set of value stocks as a whole. These results are robust to controlling for firm size with market capitalization tercile sorts.

INTRODUCTION AND LITERATURE REVIEW

Value Stock Returns: Market Efficiency or Inefficiency?

A significant body of research has found that as a group, "value stocks" (i.e., firms with above-average book-to-market ratios) tend to produce higher average returns than do "growth stocks" or "glamour stocks" (i.e., firms with below-average book-to-market ratios). Findings along these lines date back to at least Rosenberg, Reid, and Lanstein (1985), and of course the best-known paper with this finding is Fama and French (1992). This "value premium" is robust to alternative measures of value such as earnings-to-price ratio or cash flow-to-price ratio (Lakonishok, Shleifer, and Vishny, 1994; La Porta et al., 1997), across firm-size (Chan and Lakonishok, 2004; Fama and French, 2006), in pre- and post-Compustat US data (Fama and French, 2006), and internationally in twelve of the thirteen major markets examined by Fama and French (1998).

Although the existence of a value premium is widely accepted, investigators have reached widely disparate conclusions regarding the underlying reasons for this premium. For instance, the aforementioned Fama and French (1992) paper treats the difference in the average returns of high- versus low-book-to-market firms as being consistent with the notion of market efficiency. In essence, a low book-to-market ratio is viewed as evidence that the firm's shares are deemed as risky; thus, the higher average returns on such shares is interpreted as rewarding investors for accepting that risk. Other papers with results that are broadly consistent with this theme include Penman (1991), Fama and French (1995), and Chen and Zhang (1998).

On the opposite side of this debate are those scholars who argue that the higher average returns on high book-to-market firms provide evidence of market inefficiency. Specifically, Lakonishok, Shleifer, and Vishny (1994) argue that high book-to-market ratios result from excessively negative market predictions of future performance, based on weak past performance. La Porta et al. (1997) argue that these negative expectations tend to be followed by better-than-expected earnings results.

In comparing these and other papers, Piotroski (2000) argues that value stocks, more than growth stocks, are appropriate targets for fundamental analysis based on the firms' financial statements. This is because investors typically price growth stocks primarily on optimistic forecasts, rather than on financial information. Value stocks, on the other hand, are best evaluated through a careful analysis of the financial fundamentals. Thus, Piotroski (2000) argues that it is worthwhile to explore the relative attractiveness of value stocks, based on information that can be gleaned from the financial statements.

Fundamental Analysis of Value Stocks

While the Piotroski (2000) article forms the basis for this paper, Piotroski himself notes that his is far from the first effort to find stocks that the market has undervalued due to incorrect expectations. Prior efforts in this regard include articles by Frankel and Lee (1998), Dechow and Sloan (1997), and La Porta (1996).

In particular, one may wish to identify promising value stocks based on fundamental analysis of these companies' financial performance. The positive market-adjusted returns of value stocks as a group occur despite the fact that a majority of individual value stocks actually underperform the market. Thus, there has been much interest in attempting to use financial statement analysis to distinguish those specific value stocks that are likely to form the high-performing minority from those value stocks that are likely to form the underperforming majority. If one can do so, then the already-positive market-adjusted returns that one would expect to receive from a value stock portfolio can be enhanced.

Successful efforts to use fundamental analysis to predict future market returns include those of Holthausen and Larcker (1992), Lev and Thiagarajan (1993), and Abarbanell and Bushee (1997).

The Piotroski Methodology

Since the present paper is intended primarily as an attempt to replicate Piotroski's (2000) results, we will describe his work in somewhat more detail than would ordinarily be included in a literature review. For each year from 1976 through 1996, Piotroski identifies those firms whose book-to-market ratios fall into the highest quintile. To expand on his basic results, he performs a separate division of firms into terciles, based on market capitalization. His set of high book-to-market stocks is then subdivided based on whether these stocks fall into the high, medium, or low market capitalization tercile of the overall market.

Each stock in the top book-to-market quintile is then evaluated on nine separate factors, which we itemize below, and receives a score of either 1 ("good") or 0 ("bad") on each of these factors. The firm's scores on these 9 factors are summed, resulting in an "F_Score" ranging from 0 to 9, inclusive. Firms that have higher F_Scores are hypothesized to be the most likely to produce positive market-adjusted returns over the ensuing year, and vice versa. Market-adjusted return realizations are evaluated separately for firms with each score from 0 through 9; in addition, results are evaluated for firms with scores of 0 and 1 combined ("Low Score") and firms with scores of 8 and 9 combined ("High Score").

The nine factors that Piotroski (2000) considers can be divided into indicators of the following three general attributes: profitability; leverage, liquidity, and source of funds; and operating efficiency. In the area of profitability, four specific indicators are chosen. Scores of 1 are assigned for each of the following outcomes: ROA (net income before extraordinary items over beginning-of-year total assets) is positive; CFO (cash flow from operations over beginning-of-year total assets) is positive; ΔROA (current year's ROA minus prior year's ROA) is positive; and ACCRUAL (ROA minus CFO) is negative. Otherwise, scores of 0 are assigned for the respective factors.

In the area of leverage, liquidity, and source of funds, three specific indicators are chosen. Scores of 1 are assigned for each of the following outcomes: ΔLEVER (the most recent year's ratio of long-term debt to average total assets, minus the corresponding ratio for the prior year) is negative; ΔLIQUID (the most

recent year's ratio of current assets to current liabilities, minus the corresponding ratio for the prior year) is positive; and EQ_OFFER (an issuance of common equity within the past year) did not occur.

In the area of operating efficiency, two specific indicators are chosen. Scores of 1 are assigned for the following: ΔMARGIN (current year's ratio of gross margin to total sales, minus the corresponding number for the prior year) is positive; and ΔTURN (current year's ratio of total sales to beginning-of-year total assets, minus the corresponding number for the prior year) is positive.

Summary of Key Findings by Piotroski

While Piotroski (2000) evaluates a wide variety of issues, for purposes of this paper we can describe his key findings rather succinctly. First, in any given year the stocks comprising the top book-market quintile tend to have been issued by firms whose financial performance has been weak; profitability tends to have been both low and declining, leverage tends to have increased, and liquidity tends to have decreased. (Piotroski, 2000, Table 1, Panel A.) Over the ensuing one- and two-year periods, the portfolio as a whole will out-perform the market; but, the majority of individual stocks within the portfolio will underperform the market. (Piotroski, 2000, Table 1, Panel B.) Further, for the individual value stocks the market-adjusted return is more strongly positively correlated with the firm's overall F_Score than with any of the nine specific indicators comprising the F_Score. (Piotroski, 2000, Table 2.)

The heart of Piotroski's (2000) findings may be found in his Table 3. This table demonstrates that market-adjusted returns over the ensuing year tend to improve rather steadily as the F_Score increases. Statistical tests indicate that the excess of the market-adjusted returns of the High-Score firms over those of the Low-Score firms is significant at the 1% level. The same is true when comparing the High-Score firms to the value stock portfolio as a whole. Piotroski's Table 4 tests for size effects. It finds that the superiority of the market-adjusted returns of High-Score firms is strongest among those value stocks falling into the smallest market-value tercile, somewhat smaller (but still highly significant) among those falling into the middle market-value tercile, and insignificant (or at best marginally significant) among those falling into the largest market-value tercile.

Are the Piotroski Results Replicable in Subsequent Periods?

The intense interest that Piotroski's (2000) findings have generated among practitioners and individual investors alike is more than understandable. Piotroski demonstrates that over his test period, a relatively simple method exists for using publicly available accounting information to identify those value stocks that are most likely to generate strong returns, along with those that are most likely to generate weak returns. The potential implications for enhanced portfolio performance are impressive, to say the least. However, it is important to keep in mind that a decision rule that produces excess returns during one time period is not necessarily guaranteed to produce similar results in the future. First, *post hoc* analysis, even when based on plausible hypotheses such as those of Piotroski, will inevitably find some "patterns" by random chance. Of course, if a result that has been found to be statistically significant over a given time period can be demonstrated to retain its significance over ensuing time periods, this will dramatically lessen concerns that the result in question was simply the "luck of the draw."

Second, even when a given result's statistical significance was not a matter of random chance, there still is no guarantee that this result will be replicable in the future. With regard to potential market inefficiencies in particular, there is a logical case to be made for the notion that over time, "good models become bad." According to this argument, if some form of systematic mispricing of assets can be demonstrated to exist, then those individuals and institutions that possess the means to do so will exploit that mispricing. For instance, if a given subset of assets is demonstrated to produce positive excess returns, then demand for these assets will increase. The increase in demand for these assets will make them more expensive and, in the process, lower their future returns to current buyers. The opposite will apply when a given subset of assets is demonstrated to produce negative excess returns. Over time, the excess returns of both subsets of assets will move toward zero, thereby rendering a previously effective decision rule ineffective.

Thus, the goal of this paper is to examine whether the Piotroski (2000) results continue to hold after the end of his sample period.

DATA AND METHDOLOGY

Using financial statement data from Compustat, and market returns and market capitalization data from CRSP, the following methodology is employed for each fiscal year in the sample period (1976-2008). For each fiscal year T, each firm's book-to-market ratio and total market value are calculated as of the fiscal year end date for fiscal year T-1. (See Piotroski 2000, p. 11, footnote 8.) Firms are sorted into quintiles based on their book-to-market ratios, and are separately sorted into terciles based on size. Each firm that falls within the top book-to-market quintile is considered part of the sample of value firms, subject to availability of all necessary financial data and market return data.

For each such firm, each of the financial indicators described above is calculated for fiscal year T, and the firm's F_Score for fiscal year T is calculated based on these indicators. Raw returns and market-adjusted returns are then calculated for the one-year period beginning in the fifth month after the end of fiscal year T. For instance, for a firm using a calendar year, the 2008 fiscal year ends on December 31, 2008; the corresponding returns are calculated for the one-year period beginning May 1, 2009 and ending April 30, 2010. CRSP returns data are currently available only through 2010, thus necessitating the choice of 2008 as the last date for "year T." This is also why Piotroski's (2000) final "year T" is 1996.

An observation is dropped from the sample if the firm's fiscal year end date for fiscal year T is not clear in Compustat, if the firm's fiscal year T lasts for a period other than 12 months (due to a change in fiscal year end date from one year to the next), or if there is not sufficient information to calculate all variables of interest, including those that involve changes from fiscal year T-1.

This process is repeated for each year from 1976-2008. All observations with a given F_Score, regardless of the specific year within the sample period, are initially grouped together for purposes of determining the distribution of returns for that F_Score. Then, the same tests are re-run after separating the sample period into two sub-samples. The first sub-sample is for fiscal years ending in 1976-1996, inclusive, so as to match the sample period of Piotroski (2000). The second sub-sample is for the subsequent period of fiscal years 1997-2008, inclusive.

Table 1 presents the descriptive statistics for both the entire 1976-2008 sample period and the two sub-periods. (Please note that all tables are contained in Appendix A.) For the period as a whole, and for both sub-periods, high book-to-market firms tend to be both smaller and less profitable than the average firm. Only on the ACCRUAL variable do we find a slightly greater proportion of value firms than of all firms displaying a positive signal (ROA – CFO < 0). Table 1 also seems to indicate an overall decline in performance, from the earlier period to the latter period, on several of the accounting screens. For instance, for both the group of all firms and the subset of value firms, mean results for ROA, CFO, and ΔLIQUID are all lower in the latter period than during the earlier period, while the mean result for ΔLEVER is higher.

Table 2 compares market adjusted returns from value and growth investment strategies. A value strategy significantly outperforms a growth strategy for the 1976-2008 period as a whole, and for both sub-periods. Further, mean (median) returns are significantly higher from a value strategy than from a growth strategy in 23 (21) of the individual years in our 33-year sample window, and significantly lower from a value strategy in 6 (7) years. In the remaining 4 (5) years, the mean (median) returns from the two strategies are not significantly different. These results are qualitatively the same as Fama and French (2006), but individual years are not directly comparable since Fama and French use calendar years and we use fiscal years.

RESULTS

Usefulness of Financial Analysis in Predicting Forward Returns of Value Stocks

The primary purpose of this paper is to determine whether the ability of the Piotroski (2000) model to select value stocks based on fundamental financial signals has improved, diminished, or disappeared during the time since the end of the Piotroski sample period. Piotroski's results related to this issue are displayed in his Table 3. Tables 3, 4, and 5 below describe our own results for one-year raw returns and one-year market-adjusted returns. Table 3 displays our results for the same period tested by Piotroski (1976-1996); Table 4 shows the results for the sub-sample drawn after the end of the Piotroski test period (1997-2008); and, Table 5 describes our results for the overall period from 1976-2008.

First, as shown in Table 3, our results for the 1976-1996 window confirm Piotroski's finding that higher F_Scores firms tend, on average, to generate stronger returns. For instance, as shown in Panel B the mean one-year market-adjusted return to High F_Score firms is 6.88% higher than the return to the overall set of value stocks, and 26.50% higher than the return to Low F_Score firms. Both results are significant at the 1% level. In fact, the higher returns for High F_Score stocks are consistently statistically significant, with p-values well below 1%, regardless of whether these firms are being compared against Low F_Score firms or against the complete set of value firms, regardless of whether the comparison is for raw or market-adjusted returns, and regardless of whether the measure being compared is the mean return, the median return, or the percentage of positive returns. In addition to being statistically significant, the results clearly are of a sufficient size to be economically significant, particularly when the High F_Score firms are compared to the Low F_Score firms. Finally, although the relationship is not always strictly monotonic, for both raw and market-adjusted returns the mean, median, and percentage of positive returns all show an improving trend as F_Score increases.

Table 4 provides the most important contribution of this paper. This table shows that during the time period from 1997-2008 – i.e., during the portion of our sample period that falls after Piotroski's test period – a strategy of investing in High F_Score firms actually produces average market-adjusted returns inferior to those produced by investing in a broad portfolio of value stocks. The mean one-year market-adjusted return to High F_Score stocks is 23.71% lower than the return to the overall set of value stocks, and 26.52% lower than the return to Low F_Score firms. Both results are significant at the 1% level, and both results clearly appear to be economically significant.

Overall, we perform twelve tests of statistical significance for the relative performance of High F_Score firms: results are compared for mean returns, median returns, and the percentage of positive returns; on each measure the High F_Score firms are compared to both the Low F_Score firms and the overall sample of value firms; and, each comparison is performed for both raw returns and market-adjusted returns. High F_Score firms underperform in ten of these twelve comparisons; six of these results are significant at the 10% level, five at the 5% level, and four at the 1% level. In only one comparison do High F_Score firms outperform at the 10% level. Consistently, the strongest underperformance by far occurs when the point of comparison is the mean return.

Thus, the very strategy that produced significantly positive excess mean returns during the period studied by Piotroski appears to produce significantly negative excess mean returns during the ensuing twelve-year period. Said another way, a High F_Score not only no longer predicts outperformance, it actually predicts underperformance.

Perhaps not surprisingly, Table 5 shows mixed results for the overall (1976-2008) period. Mean market-adjusted returns are somewhat lower for High F_Score firms, and this result is significant at the 10% level (and arguably economically significant at 8.30%) when comparing High F_Score firms to Low F_Score firms. On the other hand, High F_Score firms produce both a higher median market-adjusted return, and a greater percentage of positive market-adjusted returns; further, raw returns are higher for High F_Score firms, regardless of the whether we compare mean returns, median returns, or the percentage of positive returns. All but one of these positive differences are significant at the 5% level, and all but two are significant at the 1% level.

In sum, depending on the basis of comparison one still could argue that an investor would have benefited by following an approach of selecting High F_Score stocks over the last 30-plus years. However, following that same approach during the period of time following Piotroski's original tests would not have produced higher returns, and in fact would have produced lower returns. This finding does not, in and of itself, prove that a good model has gone bad. The finding is, however, consistent with what one might expect to see in a case where a good model goes bad.

Fundamental Analysis and Firm Size

The outperformance of value stocks as a group is related to firm size. Loughran (1997) contends that the entire post-1963 value premium is driven by small firms and does not exist in the largest size quintile, which makes up the bulk (73%) of the total market value of publicly traded firms. Indeed, Piotroski (2000) found his strongest results among the subset of value stocks that were in the smallest market capitalization tercile of the overall stock market. (This subset included a majority of his overall sample, since most of the stocks that were in the top book-market quintile were also in the smallest market value tercile.) The results for those value stocks falling within the middle tercile of market values, while not as strong as those for the smallest value stocks, were nonetheless significant at the 1% level. Results for the largest firms were generally not statistically significant, and at best were marginally significant. These results are displayed in Piotroski's Table 4.

In Tables 6, 7, and 8 below, we perform our own tests of this issue for our sample. Table 6 displays our results for the same period tested by Piotroski (1976-1996); Table 7 shows the results for the sub-sample drawn after the end of the Piotroski test period (1997-2008); and, Table 8 describes our results for the sample period as a whole.

Table 6 shows that our findings for the early sub-period are similar to Piotroski's, in the sense that the outperformance of High F_Score firms is most consistent within the subset of value stocks falling into the smallest tercile of the overall market. Among the small value stocks, each of the four comparisons that we calculated shows outperformance of at least 10% by High F_Score firms, with a p-value that consistently falls well below 1%. However, unlike Piotroski, we find that even among those value stocks falling into the largest tercile of the overall market, High F_Score stocks significantly outperform the set of large value firms as a group. Numerically, there is an even greater difference between the results of High F_Score large stocks and Low F_Score large stocks. However, this difference is not statistically significant, most likely due to the very small sample size (N=6) of Low F_Score value firms falling within the largest tercile of the overall market during this time period.

Table 7 investigates the impact of firm size on the results for the period subsequent to that tested by Piotroski. In every size category, both the mean and median market-adjusted returns for High F_Score firms are below the corresponding numbers for both the overall set of value firms and the subset of Low F_Score firms. Mean differences are significant within both the smallest tercile and the middle tercile, but not within the largest tercile. Median differences within a given size group are not significant, the sole exception being that among the firms in the middle size tercile, the median result for High F_Score firms is significantly below that of the overall set of value firms in this size class.

Finally, Table 8 displays the results of these same tests for the overall sample period of 1997-2008. Once again, given the disparate results for the two sub-periods tested, it is perhaps not surprising to find mixed results for the overall period. For instance, among small firms, the High F_Score group had significantly above-average means during the earlier period, and significantly below-average means during the latter period; for the overall period, mean returns for these firms are not significantly different from those of other small value firms. Median returns among small firms are a different matter. Here, the High F_Score group had significantly above-average returns during the earlier period, and insignificantly below-average returns during the latter period; for the overall test period, High F_Score stocks have significantly above-average returns. Comparisons among the firms in the other two terciles show mostly insignificant results; one of the four comparisons within the middle tercile does show significantly below-average results for High F_Score firms, and one of the four comparisons within the largest tercile shows significantly above-average results for High F_Score firms.

Market Risk and the Value Premium

The value premium has received much ongoing attention in the financial economics literature because it points out a potential flaw in the long-held belief that markets are efficient and that return is an increasing function of risk as defined by beta in the Capital Asset Pricing Model (CAPM) of Sharpe (1964) and Lintner (1965). As shown in Table 2, during our overall sample period value stocks outperform growth stocks by a market-adjusted 14.37% per year. In an efficient market governed by CAPM, this outperformance should be attributable to additional market risk; yet, on average value stocks have smaller betas than do growth stocks (Fama and French, 1992), leading Fama and French (1995) to posit that the value premium is compensation for systematic risk not captured by beta.

Much of the evidence on market risk and the value premium was completed with data ending in the late 1990s (Chan and Lakonishok, 2004), using data from 1963 forward. Fama and French (2006) as well as Ang and Chen (2007) document that there is no cross-sectional variation in return prior to 1963 related to book-to-market that is not adequately explained by beta. Thus, before we try to explain the failure of High F_Score stocks to outperform other value stocks during the post-Piotroski time period, it is useful to confirm that during this interval the value premium itself cannot be explained by beta. Panel A of Table 9 presents the mean and median betas, computed over the 60 months prior to each monthly observation, of each of the 5 book-to-market quintiles over the entire 1976-2008 window and over the two sub-periods. Consistent with prior research, during all three windows the high book-to-market (value) quintile has a significantly smaller mean and median beta than does the low book-to-market (growth) quintile, indicating that the value premium documented in Table 2 is not explained by market risk as measured by beta.

Market Risk and F_Score

A question not addressed by Piotroski (2000) is whether the excess market-adjusted returns of high F_Score stocks in the 1976-1996 window is potentially explained by differences in the average beta measure. Given that the market-adjusted returns are calculated by subtracting the CRSP value weighted index from each stock's return, it is at least hypothetically possible that the apparent outperformance of High F_Score stocks in the 1976-1996 window is an artifact of F_Score capturing variation in market risk.

Panel B of Table 9 reports betas by F_Score for the entire period and for both sub-samples. The results demonstrate that the higher returns of High F_Score stocks during the Piotroski (2000) test period of 1976-1996 cannot be explained by higher average levels of beta. In fact, during this period High F_Score stocks have slightly lower mean and median betas than do either the subset of Low F_Score stocks or the overall set of value stocks. Further, while the differences are numerically modest, the difference between High F_Score stocks and the overall set of value stocks is significant at the 1% level for mean betas and at the 5% level for median betas.

During the subsequent period, the size of this gap increased substantially, as the average betas of High F_Score stocks declined while the average betas of value stocks as a group, and of Low F_Score stocks, increased. Depending on the specific comparison employed, during this period High F_Score firms have smaller average betas than do other value firms by an amount ranging from roughly 0.31 to 0.68. These differences are all significant at the 1% level, and we would argue that differences of this magnitude are economically significant as well. As noted earlier, during this same period of time the prior superior return performance of the High F_Score stocks disappeared, and in fact reversed. High F_Score firms also have relatively smaller average betas during the overall (1976-2008) time period than do other value stocks.

Thus, during the period of time tested by Piotroski, we find that the High F_Score stocks have above-average market-adjusted returns, and marginally below-average betas. During the subsequent period, High F_Score stocks have below-average market-adjusted returns, and significantly below-average betas. During the overall (1976-2008) test period, High F_Score stocks display mixed results on market-adjusted returns (lower means but higher medians), and significantly below-average betas.

We also note that even if one ignores market risk and focuses on stand-alone risk, the evidence continues to point to High F_Score stocks having lower risk than do other value stocks. For instance, in Tables 3, 4, and 5 a clear pattern emerges: the difference between the returns of High F_Score stocks and those of other value stocks is highest at the lower end of the distribution (i.e., at the 10th percentile), and declines steadily through the 25th, 50th, 75th, and 90th percentiles. Thus, the relative performance of High F_Score stocks is most impressive among the worst-performing stocks, and least impressive among the best-performing stocks, indicating that the High F_Score stocks have a narrower distribution of returns than do other value stocks. This pattern holds consistently in all three time periods that we examined, regardless of whether the High F_Score stocks are compared to Low F_Score stocks or to value stocks as a group, and also regardless of whether it is raw returns or market-adjusted returns that are being evaluated. Further, in all three time periods that we tested, in each instance in which the standard deviation of returns for High F_Score stocks differs significantly from that of all value stocks or of Low F_Score stocks, it is the High F_Score stocks that have the smaller standard deviation. As with the beta measure comparisons described above, the extent of these differences is much stronger in the post-Piotroski period and in the overall period than in the Piotroski test period.

CONCLUSIONS

Our results confirm Piotroski's (2000) finding that during his test period of 1976-1996, High F_Score stocks outperform other value stocks. In fact, if anything the stock-picking strategy outlined by Piotroski may have been even more impressive over his test period than he indicated, since the substantially higher average returns generated by High F_Score stocks were accompanied by marginally lower risk levels. Further, if one had followed the strategy outlined by Piotroski over the entirety of our longer test period of 1976-2008, by many (though not all) measures one still could have generated stronger returns, and could have done so with much less risk.

However, over the period from 1997-2008 (i.e., over the period of time since that tested by Piotroski, 2000), the tendency of High F_Score stocks to produce above-average returns has disappeared, and in fact has reversed. Mean market-adjusted returns of High F_Score stocks are lower than those of Low F_Score stocks and of value stocks as a group by 26.5% and 23.7%, respectively. It is true that during this latter period the High F_Score stocks display considerably less risk than do other value stocks, and for a risk-averse investor this finding is likely to be noteworthy. However, the fact remains that during the period of time since that tested by Piotroski, his primary finding regarding relative market-adjusted returns has reversed: on average, High F_Score stocks now produce lower returns than do other value stocks.

REFERENCES

Abarbanell, J.S. & Bushee, B.J. (1997). Fundamental Analysis, Future Earnings, and Stock Prices. *Journal of Accounting Research*, 35(1), 1-24.

Ang, A. & Chen, J. (2007). CAPM Over the Long Run: 1926-2001. *Journal of Empirical Finance*, 14(1), 1-40.

Chan, L.K.C. & Lakonishok, J. (2004). Value and Growth Investing: Review and Update. *Financial Analysts Journal*, 60(1), 71-86.

Chen, N. & Zhang, F. (1998). Risk and Return of Value Stocks. *Journal of Business*, 71(4), 501-535.

Dechow, P.M. & Sloan, R.G. (1997). Returns to Contrarian Investment Strategies: Tests of Naïve Expectations Hypotheses. *Journal of Financial Economics*, 43(1), 3-27.

Fama, E.F. & French, K.R. (1992). The Cross-Section of Expected Stock Returns. *Journal of Finance*, 47(2), 427-465.

Fama, E.F. & French, K.R. (1995). Size and Book-to-Market Factors in Earnings and Returns. *Journal of Finance*, 50(1), 131-155.

Fama, E.F. & French, K.R. (1998). Value versus Growth: The International Evidence. *Journal of Finance*, 53(6): 1975-1999.

Fama, E.F. & French, K.R. (2006). The Value Premium and the CAPM. *Journal of Finance*, 61(5), 2163-2185.

Frankel, R. & Lee, C.M.C. (1998.) Accounting Valuation, Market Expectation, and Cross-Sectional Stock Returns. *Journal of Accounting and Economics*, 25(3), 283-319.

Holthausen, R.W. & Larcker, D.F. (1992). The Prediction of Stock Returns Using Financial Statement Information. *Journal of Accounting and Economics*, 15(2-3), 373-411.

Lakonishok, J., Shleifer, A., & Vishny, R.W. (1994). Contrarian Investment, Extrapolation, and Risk. *Journal of Finance*, 49(5), 1541-1578.

La Porta, R. (1996). Expectations and the Cross-Section of Stock Returns. *Journal of Finance*, 51(5), 1715-1742.

La Porta, R., Lakonishok, J., Shleifer, A., & Vishny, R. (1997). Good News for Value Stocks: Further Evidence on Market Efficiency. *Journal of Finance*, 52(2), 859-874.

Lev, B., & Thiagarajan, S.R. (1993). Fundamental Information Analysis. *Journal of Accounting Research*, 31(2), 190-215.

Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *Review of Economics and Statistics*, 47, 13-37.

Loughran, T. (1997). Book-to-Market across Firm Size, Exchange, and Seasonality: Is There an Effect? *Journal of Financial and Quantitative Analysis*, 32(3), 249-268.

Penman, S.H. (1991). An Evaluation of Accounting Rate-of-Return. *Journal of Accounting, Auditing, and Finance*, 6(2), 233-255.

Piotroski, J.D. (2000). Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers. *Journal of Accounting Research*, 38(Supplement), 1-41.

Rosenberg, B., Reid, K., & Lanstein, R. (1985). Persuasive Evidence of Market Inefficiency. *Journal of Portfolio Management*, 11(3), 9-16.

Sharpe, W.F. (1964). Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk. *Journal of Finance*, 19, 425-442.

APPENDIX A

TABLE 1: FINANCIAL CHARACTERISTICS OF VALUE STOCKS

Cross-sectional statistics across fiscal years for each firm (i). Variables are as defined in the text.

Panel A: Entire Sample (1976-2008)

	All Firms (N=124,710)			Value Firms (N=24,937)		
Variable	Mean	Median	% Positive Signal	Mean	Median	% Positive Signal
MVE	1,485.27	98.53		303.85	24.02	
ASSETS	1,700.43	121.74		1,092.84	76.95	
BM	0.8536	0.5638		2.1803	1.2923	
ROA	-0.0061	0.0420	71.32%	-0.0656	-0.0056	47.73%
ΔROA	0.0394	-0.0009	48.90%	0.0283	-0.0180	35.28%
ΔMARGIN	-0.2305	-0.0001	49.77%	-1.0972	-0.0075	39.98%
CFO	0.0617	0.0876	78.91%	0.0185	0.0408	68.67%
ΔLIQUID	-0.1846	-0.0302	46.50%	-0.3340	-0.0974	39.93%
ΔLEVER	0.0018	-0.0010	52.29%	-0.0005	-0.0003	50.87%
ΔTURN	-0.4208	-0.0055	48.51%	-0.9739	-0.0335	41.46%
ACCRUAL	-0.0678	-0.0529	83.44%	-0.0841	-0.0557	86.16%

Panel B: Piotroski Sub-Sample (1976-1996)

	All Firms (N=75,858)			Value Firms (N=15,170)		
Variable	Mean	Median	% Positive Signal	Mean	Median	% Positive Signal
MVE	724.03	60.43		196.22	16.44	
ASSETS	943.64	77.87		625.81	51.95	
BM	0.8529	0.6189		2.1516	1.3450	
ROA	0.0148	0.0470	75.52%	-0.0394	0.0035	52.87%
ΔROA	0.0033	-0.0008	48.84%	-0.0346	-0.0165	35.31%
ΔMARGIN	0.1249	0.0000	49.88%	-0.2061	-0.0069	40.67%
CFO	0.0743	0.0941	81.54%	0.0303	0.0480	72.25%
ΔLIQUID	-0.1595	-0.0306	46.37%	-0.2534	-0.0865	40.28%
ΔLEVER	0.0014	-0.0030	54.61%	-0.0010	-0.0017	53.15%
ΔTURN	-0.2093	-0.0058	48.50%	-0.1652	-0.0330	42.06%
ACCRUAL	-0.0595	-0.0506	85.13%	-0.0697	-0.0508	87.66%

Panel C: Post-Piotroski Sub-Sample (1997-2008)

	All Firms (N=48,852)			Value Firms (N=9,767)		
Variable	Mean	Median	% Positive Signal	Mean	Median	% Positive Signal
MVE	2,667.34	227.44		471.04	43.90	
ASSETS	2,875.58	249.98		1,818.22	138.65	
BM	0.8546	0.4797		2.2250	1.1816	
ROA	-0.0386	0.0322	64.79%	-0.1062	-0.0243	39.74%
ΔROA	0.0956	-0.0009	48.98%	0.1261	-0.0212	35.23%
ΔMARGIN	-0.7823	-0.0002	49.60%	-2.4812	-0.0088	38.93%
CFO	0.0422	0.0765	74.81%	0.0003	0.0292	63.09%
ΔLIQUID	-0.2236	-0.0297	46.70%	-0.4593	-0.1194	39.40%
ΔLEVER	0.0024	0.0000	48.68%	0.0002	0.0000	47.33%
ΔTURN	-0.7493	-0.0050	48.54%	-2.2299	-0.0338	40.53%
ACCRUAL	-0.0808	-0.0578	80.83%	-0.1065	-0.0670	83.83%

TABLE 2: VALUE PREMIUM BY FISCAL YEAR, FOR OVERALL SAMPLE PERIOD, AND FOR BOTH SUB-PERIODS

Market adjusted returns for lowest book-to-market quintile (growth) versus highest book-to-market quintile (value) and value minus growth (VMG) over the one-year period beginning five months after fiscal year end.

	Growth		Value		Value minus Growth (VMG)			Wilcoxon
	Mean	Median	Mean	Median	VMG	t statistic	p-value	p-value
1976	0.2036	0.0824	0.3184	0.2020	0.1149	3.44	**0.0006**	**<0.0001**
1977	0.0909	0.0004	0.1619	0.0229	0.0710	2.23	**0.0258**	**0.0721**
1978	0.1727	-0.0091	-0.0159	-0.1174	-0.1886	-5.07	*<0.0001*	*<0.0001*
1979	0.2758	0.0737	0.1543	0.0245	-0.1215	-2.57	*0.0102*	*0.0680*
1980	-0.1379	-0.1853	0.0949	0.0650	0.2328	10.65	**<0.0001**	**<0.0001**
1981	0.1396	-0.0476	0.2499	0.0698	0.1104	2.23	**0.0259**	**0.0002**
1982	-0.1634	-0.2045	0.1840	0.0958	0.3474	12.19	**<0.0001**	**<0.0001**
1983	-0.2299	-0.2788	-0.0731	-0.1146	0.1568	6.20	**<0.0001**	**<0.0001**
1984	-0.0874	-0.1612	-0.1485	-0.1984	-0.0611	-1.96	*0.0497*	*0.0956*
1985	-0.1173	-0.1700	-0.0216	-0.1383	0.0957	2.88	**0.0040**	**0.0124**
1986	-0.1310	-0.1383	0.0350	-0.0381	0.1661	7.16	**<0.0001**	**<0.0001**
1987	-0.1594	-0.2019	-0.0356	-0.0823	0.1238	4.38	**<0.0001**	**<0.0001**
1988	-0.0823	-0.1713	-0.1408	-0.2048	-0.0585	-1.98	*0.0473*	*0.0197*
1989	-0.0534	-0.1526	-0.0498	-0.2229	0.0036	0.09	0.9320	*0.0703*
1990	0.1092	-0.0915	0.2602	-0.0447	0.1510	2.12	**0.0343**	0.1968
1991	-0.0935	-0.1757	0.2340	0.0055	0.3274	6.61	**<0.0001**	**<0.0001**
1992	0.0171	-0.1030	0.2217	0.0380	0.2046	4.96	**<0.0001**	**<0.0001**
1993	-0.1097	-0.1798	0.0252	-0.0960	0.1349	4.26	**<0.0001**	**<0.0001**
1994	0.0376	-0.1058	0.1134	-0.1361	0.0758	1.41	0.1601	0.6304
1995	-0.2578	-0.3588	-0.1006	-0.1718	0.1572	5.01	**<0.0001**	**<0.0001**
1996	-0.1254	-0.2111	0.0261	-0.1413	0.1515	3.77	**<0.0001**	**0.0009**
1997	-0.1433	-0.3053	-0.1675	-0.3541	-0.0243	-0.58	0.5613	0.1011
1998	0.3399	-0.0674	0.2821	-0.0967	-0.0579	-0.90	0.3695	0.3552
1999	-0.1352	-0.2859	0.1856	0.0023	0.3207	7.66	**<0.0001**	**<0.0001**
2000	0.0293	-0.0324	0.3258	0.1071	0.2965	6.89	**<0.0001**	**<0.0001**
2001	-0.0370	-0.0759	0.1296	-0.1021	0.1667	3.67	**<0.0001**	0.5428
2002	0.3165	0.0784	1.0219	0.5358	0.7054	9.63	**<0.0001**	**<0.0001**
2003	-0.0744	-0.1102	0.0759	-0.0127	0.1503	5.25	**<0.0001**	**<0.0001**
2004	0.0787	-0.0440	0.1501	0.0060	0.0714	1.98	**0.0476**	**0.0206**
2005	-0.0638	-0.1004	0.0569	-0.0038	0.1207	4.44	**<0.0001**	**<0.0001**
2006	-0.0734	-0.1146	-0.1808	-0.2173	-0.1074	-4.41	*<0.0001*	*<0.0001*
2007	-0.0402	-0.0614	-0.0839	-0.1526	-0.0436	-2.07	*0.0385*	*<0.0001*
2008	0.1099	-0.0433	1.1213	0.4445	1.0114	9.78	**<0.0001**	**<0.0001**
1976-2008	-0.0159	-0.1188	0.1278	-0.0488	0.1437	18.03	**<0.0001**	**<0.0001**
1976-1996	-0.0429	-0.1367	0.0652	-0.0566	0.1081	12.21	**<0.0001**	**<0.0001**
1997-2008	0.0259	-0.0919	0.2249	-0.0387	0.1990	13.32	**<0.0001**	**<0.0001**

Bolded p-values: Value strategy outperforms growth strategy, with p ≤0.10.
Italicized p-values: Value strategy underperforms growth strategy, with p ≤0.10.

TABLE 3: BUY AND HOLD RETURNS TO FUNDAMENTAL VALUE STRATEGY (1976-1996)

Panel A: One-Year Raw Returns

	Mean	10%	25%	Median	75%	90%	% Positive	σ	N
All High BM Firms	0.2350	-0.4333	-0.1783	0.0932	0.4360	0.9103	58.96%	0.8637	15,170
F_SCORE:									
0									0
1	0.0321	-0.6510	-0.4615	-0.1484	0.3000	1.1905	38.37%	0.7161	86
2	0.1836	-0.5769	-0.3434	-0.0240	0.3636	0.8966	46.63%	1.1470	802
3	0.1700	-0.5909	-0.3500	0.0000	0.3751	0.9623	48.72%	1.1003	1,831
4	0.1968	-0.5102	-0.2537	0.0197	0.3714	0.9710	51.87%	0.9513	2,747
5	0.2373	-0.4085	-0.1667	0.0990	0.4316	0.8887	59.66%	0.8844	3,042
6	0.2535	-0.3403	-0.1111	0.1330	0.4717	0.9134	63.37%	0.6315	2,689
7	0.2759	-0.3077	-0.0786	0.1485	0.4650	0.8913	66.50%	0.6918	2,137
8	0.3044	-0.2258	-0.0501	0.1709	0.4746	0.8889	69.34%	0.7501	1,484
9	0.3373	-0.2500	-0.0344	0.2062	0.4884	0.9333	71.31%	0.7105	352
Low Score	0.0321	-0.6510	-0.4615	-0.1484	0.3000	1.1905	38.37%	0.7161	86
High Score	0.3107	-0.2308	-0.0465	0.1750	0.4796	0.9016	69.72%	0.7426	1,836
High-All	0.0757	0.2026	0.1318	0.0818	0.0436	-0.0087	10.76%	-0.1211	
p-value of test statistic	<0.0001			<0.0001			<0.0001	<0.0001	
High-Low	0.2786	0.4202	0.4150	0.3234	0.1796	-0.2889	31.34%	0.0265	
p-value of test statistic	0.0007			<0.0001			<0.0001	0.6820	

Panel B: One-Year Market-Adjusted Returns

	Mean	10%	25%	Median	75%	90%	% Positive	σ	N
All High BM Firms	0.0652	-0.5924	-0.3302	-0.0566	0.2620	0.7209	44.40%	0.8495	15,170
F_SCORE:									
0									0
1	-0.1310	-0.8647	-0.6160	-0.3277	0.1744	0.9040	32.56%	0.6967	86
2	0.0223	-0.7370	-0.4914	-0.1647	0.2046	0.7615	36.91%	1.1348	802
3	0.0047	-0.7508	-0.4902	-0.1717	0.2118	0.7521	36.92%	1.0893	1,831
4	0.0366	-0.6753	-0.4112	-0.1134	0.2013	0.7659	39.75%	0.9364	2,747
5	0.0612	-0.5784	-0.3268	-0.0569	0.2490	0.6935	43.56%	0.8700	3,042
6	0.0832	-0.5054	-0.2705	-0.0210	0.3008	0.7135	48.35%	0.6131	2,689
7	0.1019	-0.4620	-0.2491	-0.0070	0.2949	0.6946	49.18%	0.6788	2,137
8	0.1297	-0.4189	-0.2083	0.0139	0.3188	0.6801	51.68%	0.7358	1,484
9	0.1524	-0.4291	-0.1977	0.0367	0.3106	0.7631	56.82%	0.6928	352
Low Score	-0.1310	-0.8647	-0.6160	-0.3277	0.1744	0.9040	32.56%	0.6967	86
High Score	0.1341	-0.4204	-0.2077	0.0227	0.3185	0.7219	52.67%	0.7276	1,836
High-All	0.0688	0.1721	0.1225	0.0792	0.0565	0.0010	8.27%	-0.1219	
p-value of test statistic	0.0002			<0.0001			<0.0001	<0.0001	
High-Low	0.2650	0.4443	0.4083	0.3503	0.1442	-0.1821	20.11%	0.0309	
p-value of test statistic	0.0010			<0.0001			0.0004	0.6180	

TABLE 4: BUY AND HOLD RETURNS TO FUNDAMENTAL VALUE STRATEGY (1997-2008)

Panel A: One-Year Raw Returns

	Mean	10%	25%	Median	75%	90%	% Positive	σ	N
All High BM Firms	0.2726	-0.6318	-0.3590	0.0034	0.4713	1.2748	50.35%	1.2770	9,767
F_SCORE:									
0	0.2063	-0.7692	-0.4725	0.0222	0.4444	1.8504	50.91%	0.9960	55
1	0.2871	-0.7123	-0.4891	-0.1133	0.5564	1.7200	45.47%	1.3724	519
2	0.3198	-0.7070	-0.4659	-0.0519	0.5167	1.5000	47.29%	1.6213	1,326
3	0.3621	-0.7036	-0.4091	-0.0039	0.5526	1.5977	49.51%	1.5964	2,143
4	0.2655	-0.6029	-0.3532	0.0077	0.4785	1.2691	50.50%	1.0975	2,200
5	0.2218	-0.5853	-0.3162	0.0077	0.4167	1.0941	50.55%	1.0943	1,636
6	0.1975	-0.5559	-0.2686	0.0448	0.4222	0.9490	55.75%	0.9060	1,087
7	0.2016	-0.4979	-0.2408	0.0373	0.3980	0.9302	54.71%	0.7747	605
8	0.0991	-0.4216	-0.2353	-0.0488	0.3111	0.8491	46.67%	0.5436	180
9	0.0630	-0.3125	-0.2138	-0.0209	0.3318	0.5050	43.75%	0.3379	16
Low Score	0.2794	-0.7123	-0.4872	-0.0962	0.5395	1.7200	45.99%	1.3405	574
High Score	0.0962	-0.4024	-0.2353	-0.0427	0.3111	0.8256	46.43%	0.5293	196
High-All	-0.1765	0.2293	0.1238	-0.0461	-0.1602	-0.4493	-3.92%	-0.7477	
p-value of test statistic	<0.0001			0.9549			0.2802	<0.0001	
High-Low	-0.1832	0.3099	0.2519	0.0535	-0.2284	-0.8944	0.44%	-0.8112	
p-value of test statistic	0.0068			0.0844			0.9340	<0.0001	

Panel B: One-Year Market-Adjusted Returns

	Mean	10%	25%	Median	75%	90%	% Positive	σ	N
All High BM Firms	0.2249	-0.6085	-0.3595	-0.0387	0.3855	1.1373	46.81%	1.2298	9,767
F_SCORE:									
0	0.1626	-0.6622	-0.4460	-0.1239	0.4429	1.7502	40.00%	0.9051	55
1	0.2625	-0.6617	-0.4260	-0.0886	0.4764	1.5282	43.16%	1.3104	519
2	0.2800	-0.6583	-0.4332	-0.0804	0.4284	1.3106	44.42%	1.5678	1,326
3	0.3191	-0.6429	-0.3884	-0.0468	0.4758	1.4340	46.24%	1.5396	2,143
4	0.2148	-0.5982	-0.3533	-0.0293	0.3922	1.1256	47.86%	1.0476	2,200
5	0.1763	-0.5808	-0.3269	-0.0311	0.3265	1.0079	47.62%	1.0552	1,636
6	0.1428	-0.5465	-0.2769	-0.0042	0.3275	0.8672	49.22%	0.8730	1,087
7	0.1369	-0.5148	-0.2873	0.0045	0.3327	0.8189	50.41%	0.7478	605
8	-0.0039	-0.4964	-0.3512	-0.1269	0.2033	0.6157	38.33%	0.5236	180
9	-0.1057	-0.4134	-0.3621	-0.1658	0.1466	0.3444	31.25%	0.3121	16
Low Score	0.2530	-0.6617	-0.4260	-0.1034	0.4613	1.5282	42.86%	1.2769	574
High Score	-0.0122	-0.4752	-0.3544	-0.1369	0.1997	0.5962	37.76%	0.5098	196
High-All	-0.2371	0.1334	0.0051	-0.0982	-0.1857	-0.5412	-9.06%	-0.7200	
p-value of test statistic	<0.0001			0.0548			0.0138	<0.0001	
High-Low	-0.2652	0.1866	0.0717	-0.0335	-0.2616	-0.9321	-1.50%	-0.7671	
p-value of test statistic	<0.0001			0.6000			0.2399	<0.0001	

TABLE 5: BUY AND HOLD RETURNS TO FUNDAMENTAL VALUE STRATEGY (1976-2008)

Panel A: One-Year Raw Returns

	Mean	10%	25%	Median	75%	90%	% Positive	σ	N
All High BM Firms	0.2498	-0.5233	-0.2432	0.0625	0.4465	1.0313	55.59%	1.0454	24,937
F_SCORE:									
0	0.2063	-0.7692	-0.4725	0.0222	0.4444	1.8504	50.91%	0.9960	55
1	0.2509	-0.6944	-0.4875	-0.1173	0.5333	1.5811	44.46%	1.3021	605
2	0.2685	-0.6667	-0.4172	-0.0411	0.4627	1.3000	47.04%	1.4620	2,128
3	0.2736	-0.6519	-0.3816	0.0000	0.4634	1.2797	49.14%	1.3931	3,974
4	0.2273	-0.5559	-0.2960	0.0146	0.4167	1.1042	51.26%	1.0194	4,947
5	0.2319	-0.4737	-0.2157	0.0714	0.4243	0.9432	56.48%	0.9629	4,678
6	0.2374	-0.4000	-0.1540	0.1111	0.4596	0.9286	61.18%	0.7216	3,776
7	0.2595	-0.3636	-0.1111	0.1281	0.4600	0.9005	63.89%	0.7115	2,742
8	0.2822	-0.2647	-0.0723	0.1523	0.4590	0.8846	66.89%	0.7333	1,664
9	0.3254	-0.2503	-0.0467	0.2035	0.4834	0.9333	70.11%	0.7005	368
Low Score	0.2472	-0.6972	-0.4871	-0.1042	0.5297	1.6031	45.00%	1.2788	660
High Score	0.2900	-0.2626	-0.0659	0.1611	0.4613	0.8942	67.47%	0.7275	2,032
High-All	0.0403	0.2606	0.1773	0.0986	0.0148	-0.1370	11.88%	-0.3179	
p-value of test statistic	0.0211			<0.0001			<0.0001	<0.0001	
High-Low	0.0429	0.4346	0.4211	0.2653	-0.0684	-0.7088	22.47%	-0.5513	
p-value of test statistic	0.4129			<0.0001			<0.0001	<0.0001	

Panel B: One-Year Market-Adjusted Returns

	Mean	10%	25%	Median	75%	90%	% Positive	σ	N
All High BM Firms	0.1278	-0.5998	-0.3417	-0.0488	0.3034	0.8668	45.34%	1.0185	24,937
F_SCORE:									
0	0.1626	-0.6622	-0.4460	-0.1239	0.4429	1.7502	40.00%	0.9051	55
1	0.2066	-0.6838	-0.4456	-0.1321	0.4379	1.4116	41.65%	1.2490	605
2	0.1828	-0.6786	-0.4535	-0.1119	0.3298	1.1021	41.59%	1.4254	2,128
3	0.1743	-0.6908	-0.4398	-0.1046	0.3303	1.0823	41.95%	1.3598	3,974
4	0.1159	-0.6410	-0.3828	-0.0764	0.2852	0.9437	43.36%	0.9913	4,947
5	0.1014	-0.5787	-0.3268	-0.0479	0.2735	0.7653	44.98%	0.9404	4,678
6	0.1003	-0.5141	-0.2720	-0.0146	0.3075	0.7536	48.60%	0.6983	3,776
7	0.1096	-0.4732	-0.2532	-0.0058	0.3006	0.7209	49.45%	0.6946	2,742
8	0.1153	-0.4349	-0.2269	0.0030	0.3123	0.6756	50.24%	0.7169	1,664
9	0.1412	-0.4291	-0.2083	0.0329	0.3074	0.7559	55.71%	0.6825	368
Low Score	0.2029	-0.6829	-0.4458	-0.1255	0.4393	1.4121	41.52%	1.2235	660
High Score	0.1200	-0.4302	-0.2239	0.0110	0.3106	0.6874	51.23%	0.7107	2,032
High-All	-0.0078	0.1695	0.1178	0.0598	0.0073	-0.1794	5.89%	-0.3078	
p-value of test statistic	0.6457			0.0002			<0.0001	<0.0001	
High-Low	-0.0830	0.2527	0.2219	0.1365	-0.1287	-0.7247	9.72%	-0.5128	
p-value of test statistic	0.0985			<0.0001			<0.0001	<0.0001	

TABLE 6: BUY AND HOLD MARKET-ADJUSTED RETURNS TO FUNDAMENTAL VALUE STRATEGY BY SIZE TERCILE (1976-1996)

Panel A: Small Firms

	Mean	Median	N
All Firms	0.0960	-0.0774	9,169
F_SCORE			
0			0
1	-0.0805	-0.3200	67
2	0.0399	-0.1710	612
3	0.0367	-0.1820	1,350
4	0.0674	-0.1241	1,822
5	0.0964	-0.0728	1,782
6	0.1062	-0.0354	1,496
7	0.1444	-0.0063	1,103
8	0.2114	0.0315	764
9	0.2151	0.0346	173
Low Score	-0.0805	-0.3200	67
High Score	0.2120	0.0323	937
High-All	0.1161	0.1097	
p-value of test statistic	0.0003	<0.0001	
High-Low	0.2926	0.3523	
p-value of test statistic	0.0029	<0.0001	

Panel B: Medium and Large Firms

	Medium Firms			Large Firms		
	Mean	Median	N	Mean	Median	N
All Firms	0.0096	-0.0620	4,053	0.0362	-0.0035	1,948
F_SCORE						
0			0			0
1	-0.4347	-0.5478	13	-0.0361	-0.0960	6
2	-0.0499	-0.2005	162	0.0555	-0.0421	28
3	-0.0808	-0.1485	385	-0.1012	-0.0882	96
4	-0.0384	-0.1313	673	0.0144	-0.0438	252
5	0.0066	-0.0654	848	0.0209	-0.0134	412
6	0.0588	-0.0212	770	0.0464	0.0077	423
7	0.0643	-0.0191	657	0.0432	0.0064	377
8	0.0261	-0.0222	442	0.0701	0.0453	278
9	0.0493	0.0434	103	0.1494	0.0538	76
Low Score	-0.4347	-0.5478	13	-0.0361	-0.0960	6
High Score	0.0305	-0.0143	545	0.0871	0.0453	354
High-All	0.0208	0.0477		0.0509	0.0488	
p-value of test statistic	0.3277	0.0078		0.0170	0.0199	
High-Low	0.4652	0.5334		0.1232	0.1413	
p-value of test statistic	0.0002	0.0011		0.4078	0.4635	

TABLE 7: BUY AND HOLD MARKET-ADJUSTED RETURNS TO FUNDAMENTAL VALUE STRATEGY BY SIZE TERCILE (1997-2008)

Panel A: Small Firms

	Mean	Median	N
All Firms	0.2652	-0.0510	6,363
F_SCORE			
0	0.2390	-0.1169	46
1	0.2719	-0.1058	397
2	0.3059	-0.0999	998
3	0.3737	-0.0648	1,497
4	0.2280	-0.0374	1,417
5	0.2069	-0.0484	970
6	0.1947	-0.0126	615
7	0.1780	0.0115	320
8	0.0493	-0.0885	94
9	-0.1716	-0.2903	9
Low Score	0.2685	-0.1083	443
High Score	0.0300	-0.1219	103
High-All	-0.2352	-0.0709	
p-value of test statistic	0.0002	0.4031	
High-Low	-0.2385	-0.0136	
p-value of test statistic	0.0061	0.9514	

Panel B: Medium and Large Firms

	Medium Firms			Large Firms		
	Mean	Median	N	Mean	Median	N
All Firms	0.1706	-0.0341	2,532	0.0890	0.0192	872
F_SCORE						
0	-0.2620	-0.1310	7	-0.1088	-0.1088	2
1	0.2290	-0.0385	112	0.2669	0.0819	10
2	0.2025	-0.0453	282	0.1913	0.0821	46
3	0.2013	-0.0358	516	0.1575	0.0530	130
4	0.2231	-0.0136	569	0.1055	0.0021	214
5	0.1784	0.0013	460	0.0277	-0.0088	206
6	0.0708	-0.0182	330	0.0854	0.0289	142
7	0.1045	-0.0732	197	0.0600	0.0360	88
8	-0.0924	-0.1565	56	-0.0053	-0.0634	30
9	-0.1599	-0.4108	3	0.0833	-0.0337	4
Low Score	0.2001	-0.0402	119	0.2043	-0.0411	12
High Score	-0.0958	-0.1567	59	0.0051	-0.0634	34
High-All	-0.2665	-0.1226		-0.0839	-0.0826	
p-value of test statistic	<0.0001	0.0335		0.2474	0.4404	
High-Low	-0.2959	-0.1165		-0.1992	-0.0223	
p-value of test statistic	0.0068	0.3394		0.3630	0.6106	

TABLE 8: BUY AND HOLD MARKET-ADJUSTED RETURNS TO FUNDAMENTAL VALUE STRATEGY BY SIZE TERCILE (1976-2008)

Panel A: Small Firms

	Mean	Median	N
All Firms	0.1653	-0.0675	15,532
F_SCORE			
0	0.2390	-0.1169	46
1	0.2210	-0.1513	464
2	0.2048	-0.1269	1,610
3	0.2139	-0.1241	2,847
4	0.1377	-0.0894	3,239
5	0.1354	-0.0656	2,752
6	0.1319	-0.0264	2,111
7	0.1520	0.0007	1,423
8	0.1936	0.0230	858
9	0.1960	0.0266	182
Low Score	0.2226	-0.1394	510
High Score	0.1940	0.0242	1,040
High-All	0.0287	0.0918	
p-value of test statistic	0.3302	<0.0001	
High-Low	-0.0286	0.1636	
p-value of test statistic	0.6527	<0.0001	

Panel B: Medium and Large Firms

	Medium Firms			Large Firms		
	Mean	Median	N	Mean	Median	N
All Firms	0.0715	-0.0502	6,585	0.0525	0.0031	2,820
F_SCORE						
0	-0.2620	-0.1310	7	-0.1088	-0.1088	2
1	0.1599	-0.0875	125	0.1533	0.0062	16
2	0.1104	-0.0850	444	0.1399	0.0487	74
3	0.0807	-0.0872	901	0.0476	-0.0240	226
4	0.0814	-0.0749	1,242	0.0563	-0.0208	466
5	0.0670	-0.0448	1,308	0.0231	-0.0120	618
6	0.0624	-0.0204	1,100	0.0562	0.0174	565
7	0.0736	-0.0220	854	0.0464	0.0103	465
8	0.0128	-0.0486	498	0.0628	0.0292	308
9	0.0434	0.0342	106	0.1461	0.0538	80
Low Score	0.1376	-0.1089	132	0.1242	-0.0464	18
High Score	0.0181	-0.0214	604	0.0799	0.0351	388
High-All	-0.0534	0.0288		0.0274	0.0320	
p-value of test statistic	0.0085	0.2691		0.1803	0.0721	
High-Low	-0.1194	0.0874		-0.0442	0.0815	
p-value of test statistic	0.1852	0.2038		0.7616	0.6360	

TABLE 9: INVESTMENT STRATEGY BETAS

Panel A: Beta by Book-to-Market Quintile

	Entire Sample (1976-2008)		Piotroski Sample (1976-1996)		Post-Piotroski Sample (1997-2008)	
	Mean	Median	Mean	Median	Mean	Median
Low BM (Growth)	1.3360	1.2715	1.2772	1.2750	1.4272	1.2618
BM 2	1.1999	1.1289	1.1858	1.1588	1.2219	1.0580
BM 3	1.0961	1.0191	1.0617	1.0391	1.1495	0.9768
BM 4	1.0486	0.9588	0.9788	0.9477	1.1570	0.9843
High BM (Value)	1.0872	0.9846	0.9658	0.9473	1.2757	1.0711
Value-Growth	-0.2488	-0.2869	-0.3114	-0.3277	-0.1515	-0.1907
p-value of test statistic	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Panel B: Beta by F_Score

	Entire Sample (1976-2008)		Piotroski Sample (1976-1996)		Post-Piotroski Sample (1997-2008)	
	Mean	Median	Mean	Median	Mean	Median
All High BM Firms	1.0872	0.9846	0.9658	0.9473	1.2757	1.0711
F_SCORE						
0	1.5151	1.1689	N/A	N/A	1.5151	1.1689
1	1.4335	1.2862	1.0176	0.9557	1.5024	1.3591
2	1.3403	1.1838	1.0384	1.0548	1.5229	1.3041
3	1.2995	1.1631	1.0966	1.0859	1.4729	1.2513
4	1.1218	1.0097	1.0061	0.9828	1.2662	1.0521
5	1.0126	0.9397	0.9612	0.9433	1.1081	0.9341
6	0.9377	0.8879	0.9101	0.8953	1.0061	0.8473
7	0.8963	0.8579	0.8844	0.8686	0.9382	0.8242
8	0.9101	0.9127	0.9200	0.9377	0.8281	0.7646
9	0.9372	0.9113	0.9455	0.9204	0.7550	0.7005
Low Score	1.4403	1.2822	1.0176	0.9557	1.5037	1.3278
High Score	0.9150	0.9124	0.9249	0.9343	0.8221	0.7646
High-All	-0.1722	-0.0722	-0.0409	-0.0130	-0.4536	-0.3065
p-value of test statistic	<0.0001	<0.0001	0.0061	0.0417	<0.0001	<0.0001
High-Low	-0.5253	-0.3697	-0.0927	-0.0215	-0.6816	-0.5633
p-value of test statistic	<0.0001	<0.0001	0.3148	0.4530	<0.0001	<0.0001