Is There a Cost to Being Socially Responsible in Investing?

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There is a growing literature that suggests that socially responsible investing may produce higher risk-adjusted portfolio returns than merely using all available stocks in the equity universe. An investor might expect lower returns, for example, to companies that damage the natural environment, sell liquor and other alcoholic products, produce, design, or use nuclear power, engage in gambling, or serve as large defense contractors, when one considers the possible corporate expenses of fines and litigation.[1]

Is socially screened investing a "dumb" idea, as has been put forth in some recent popular press? (Rothchild [1996]). According to Morningstar, twenty-four socially screened mutual funds have substantially underperformed the S&P 500 during the past five and ten years. The difference between the average return on socially screened equity mutual funds and the 2,034 unscreened equity mutual funds has dropped nevertheless from –417 basis points over the past five years to –105 basis points over the past ten years, a less meaningful differential, particularly given the very small number of socially screened equity mutual funds with long-term track records.

There are only six socially screened equity mutual funds with five-year track records in the Morningstar universe, and only Dreyfus Third Century and Parnassus have ten-year records. The College Retirement Equities Fund (CREF) Social Choice Account, a balanced portfolio of 62% socially screened equities and 38% debt, has matched its annualized benchmark for the past five years. The equity performance of the CREF Social Choice Account provides substantial evidence that social screening need not lead to the recent underperformance that one finds in the Morningstar socially responsible fund universe.[2]

We will show that a socially screened universe return is not significantly different from an unscreened universe return for the 1987-1994 period. We also show that a composite model integrating value and growth components can consistently produce positive and statistically significant correlations between the stock's expected return ranking and its subsequent performance. Significant outperformance is generated in a socially screened investment universe. It is not "dumb" to be a socially conscious investor; rather, one must look at how a manager implements the investment process.

STOCK UNIVERSES

The purposes of this study are: 1) to examine the returns of an unscreened equity universe composed of 1,300 equity stocks and a socially screened universe of approximately 950 stocks, and test whether there are statistically significant differences in the average returns of the two equity universes; and 2) to examine whether a composite model using both value and growth components is as

effective in the screened universe as in the unscreened universe in identifying undervalued securities that combined into portfolios may outperform the screened universe benchmark.

We show that there is no significant difference between the average monthly returns of the screened and unscreened universes during the 1987-1994 period. Indeed, from January 1987 through December 1994, there is less than a 15-basis point differential in equally weighted annualized stock returns. We also show that a composite model using both value and growth (IBES) components produces statistically significant information coefficients (ICs) in the unscreened and screened stock universes. There are no significant differences in stock selection modeling in screened and unscreened universes, and significant excess returns may be realized using quantitative models in the screened universe.

The screens used in this analysis are provided by Kinder, Lydenberg, and Domini (KLD), and address the following social investing issues: military; nuclear power; product (alcohol, tobacco, and gambling); and environment. The Vantage Global Advisors' (VGA) unscreened 1,300-stock universe produced a 1.068% monthly average return during the January 1987-December 1994 period, so a $1.00 investment grew to $2.77. A corresponding investment in the socially screened universe would have grown to $2.74, for a 1.057% average monthly return.

There is no statistically significant difference in the respective return series, and more important, there is no economically meaningful difference between the return differential. The variability of the two return series is almost equal during the 1987-1994 period. One can test for statistically significant differences in the two return series using the F-test, which examines the differences in series mean (returns) relative to the standard deviations of the series. The F-test indicates that the series are not statistically different from one another.

EXAMPLES

Let us examine the financial characteristics of the stocks in the unscreened and socially screened VGA universes as of December 1994. The unscreened VGA universe of 1,300 stocks had BARRA growth and book-to-price sensitivities of 0.185 and 0.306; the socially screened VGA universe had corresponding BARRA growth and book-to-price sensitivities of 0.269 and 0.279. The unscreened universe had an average market capitalization of $3.433 billion in December 1994, while the socially screened universe had a mean capitalization of $2.796 billion. The average BARRA growth and book-to-price sensitivities of the excluded securities were –0.164 and 0.414, and the average market capitalization of the excluded stocks exceeded $6.1 billion.

Thus, socially screened-out stocks had higher market capitalizations and were more value-oriented than the unscreened universe, a condition noted by Kurtz and DiBartolomeo [1996]. There is a statistically significant difference between the unscreened VGA universe lower price-to-book ratio and the higher price-to-book ratio of the Vantage screened universe.

Fama and French [1995] have found that smaller stocks with lower price-to-book ratios tend to outperform larger stocks with higher price-to-book ratios in the very long run.[3] The higher price-to-book ratio of the screened universe represents a risk exposure to a socially responsible investor. The screened universe is more sensitive to the BARRA growth factor return than the Vantage unscreened universe, and this exposure should help relative performance for socially responsible investors when the BARRA growth factor return outperforms the BARRA value factor return.[4]

This higher growth sensitivity helped Luck and Pilotte [1993] find that the Domini Social Index (DSI) outperformed the S&P 500 index during the May 1990-September 1992 period. Using the BARRA Performance Analysis package (PAN), they find that the 400 securities in the Domini Social Index produced an annualized active return of 233 basis points relative to the S&P 500, and that specific asset selection accounts for 199 basis points of the active return. Luck and Pilotte note that the May 1990-September 1992 period is characterized by positive growth factor and size returns (smaller stocks outperformed larger-capitalized stocks as a rule during this period).

Superior asset selection may have been created when Kinder, Lydenberg, Domini & Co. created the DSI in May 1990 by including non-S&P 500 stocks with "good" records on corporate citizenship, product quality, and board representation of women and minorities. KLD developed these criteria to establish the records of socially responsible firms (see KLD [1993]).

For example, in March 1992, KLD produced a screen of twenty-four publicly traded firms that deal in or use recycled materials. A second screen of

twenty companies known for quality products was then developed, although one-third of these firms failed other screens. In August 1992, twelve firms were recognized by a KLD diversity screen that identifies firms with four or more women or minority board seats (or at least one-third of the members if the firm had fewer than twelve board members). Additional KLD screens in August 1992 identify ten firms with women or minority CEOs and twenty firms that have notable records on promoting women and minorities.

The KLD screens establish criteria to substantiate good corporate citizenship. These criteria do not "cost" the investor any meaningful average return during the 1987-1994 period and may have produced positive active returns (relative to the S&P 500) during some subperiods.

STOCK SELECTION IN UNSCREENED AND SCREENED UNIVERSES

Can a composite stock selection model, using value and growth factors, be effective in selecting securities that outperform the market in a socially screened universe? We can estimate a quantitative model on the largest 3,000 securities publicly traded on any exchange during the 1982-1994 period. The model has seven variables: six value factors, and a composite, proprietary growth variable. The six value factors are earnings-to-price, book value-to-price, cash flow-to-price, sales-to-price, dividend yield, and net current asset value.

The earnings, book value, cash flow, and sales variables are traditional fundamental variables examined in the investment literature (see Jacobs and Levy [1988], Ziemba [1992], and Guerard, Takano, and Yamane [1993]).[5] The traditional theory of value investing holds that securities with higher earnings, book value, cash flow, and sales are preferred to securities with lower such values.

The net current asset value is the current assets of a firm less its total liabilities. A firm is hypothesized to be undervalued when its net current asset value is less than its stock price (Graham and Dodd [1962] and Vu [1990]).

The proprietary growth variable is created from consensus IBES forecasts, forecast revisions, and breadth of forecasts (number of forecasts raised less number of forecasts lowered, with the result divided by the total number of forecasts). It is of the general form described in Wheeler [1990].

There is a very large literature on the effectiveness of IBES forecasts, revisions, and breadth summarized in Brown [1993] and Keon [1996]. Blin, Bender, and Guerard [1995, 1996] and Guerard, Blin, and Bender [1996a, 1996b] find that the use of IBES forecasts and revisions may not be sufficient to produce statistically significant excess returns in the U.S. and Japan, once one accounts for the transaction costs associated with the rather large turnover rates required by these strategies.

The proprietary IBES variable greatly enhances return even after transaction costs have been included. The model may be summarized as follows:

$$TR_T = a_0 + a_1EP_t + a_2BP_t + a_3CP_t + a_4SP_t + a_5DY_t + a_6NCAV_t + a_7CIBF_t + e_t$$

where

TR	is total returns for the subsequent holding period (quarter);
EP	is the (net income per shares) earnings-to-price ratio;
BP	is the book value per share-to-price ratio;
CP	is the cash flow per share-to-price ratio;
SP	is the sales-to-price ratio;
DY	is the dividend yield;
NCAV	is the net current asset value per share;
CIBF	is the proprietary growth variable; and
e	is the randomly distributed error term.

The expected returns are created as described in Guerard [1987, 1990], Guerard and Takano [1992], and Guerard, Takano, and Yamane [1993]. Quarterly cross-sectional regressions are run for each quarter during the 1982-1994 period every March, June, September, and December. The dependent variable is the coming return for the subsequent three months, and the independent variables are constructed from the Compustat data base in which the annual data are the fundamental assumed to be known in June of each year and monthly prices are used to construct the valuation ratios.

The quarterly weights are calculated by: 1) finding the independent variables that are positive (the hypothesized sign of the coefficients) and statistically significant at the 10% level; 2) normalizing the regression coefficients to be weights that sum to one; and 3) averaging the coefficients over the past four quarters.[6]

The cross-sectional regressions employ the Beaton-Tukey [1974] biweight technique in which the regressions are re-estimated iteratively and observations weighted inversely with their ordinary least squares errors; i.e., the larger the residual, the lower the observation weight in the regression. The Beaton-Tukey outlier adjustment procedure, also referred to as robust regression, ROB, has been shown to produce more efficient composite models for creating a statistically based expected return ranking model than ordinary least squares, OLS.[7]

Application of the Beaton-Tukey outlier adjustment procedure to the largest 3,000 securities during the 1982-1994 period and estimation of the equation produces the regression coefficients scaled to become the weights shown in Exhibits 1-7, where the value variable weights average approximately 65% during the period. The proprietary growth variable weight approaches 50% during the 1990-1994 period and averages 35%, quite consistent with the Guerard [1990] and Miller, Guerard, and Takano [1992] estimations. The composite model has an average F-statistic of 28, and is statistically significant at the 5% level. The expected return ranking procedure produces an average information coefficient of 0.08 and an average t-value of 4.4 for the period.

The composite model ICs are shown in Exhibit 8, as are the upper and lower quintile returns relative to the average universe stock return. The lower quintile of securities (least-preferred) consistently underperforms the average stock return, and the upper quintile of securities (most-preferred) produces positive excess returns so that the quintile spread is positive and statistically significant. The

EXHIBIT 1
COMPOSITE MODEL WEIGHTS 1982-1994

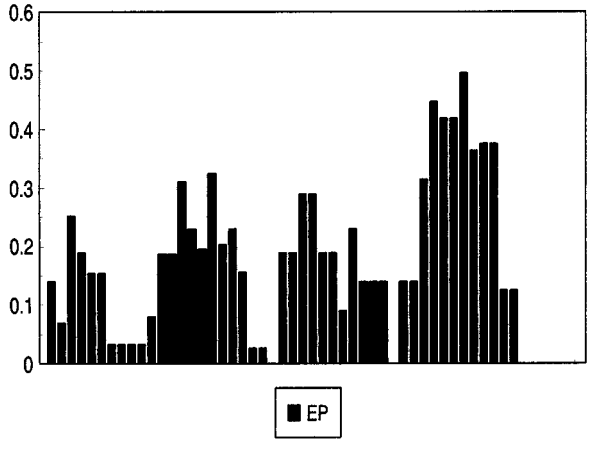


EXHIBIT 2
COMPOSITE MODEL WEIGHTS 1982-1994

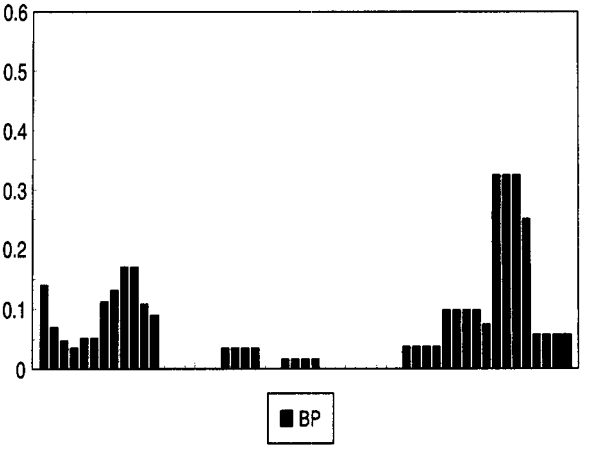


EXHIBIT 3
COMPOSITE MODEL WEIGHTS 1982-1994

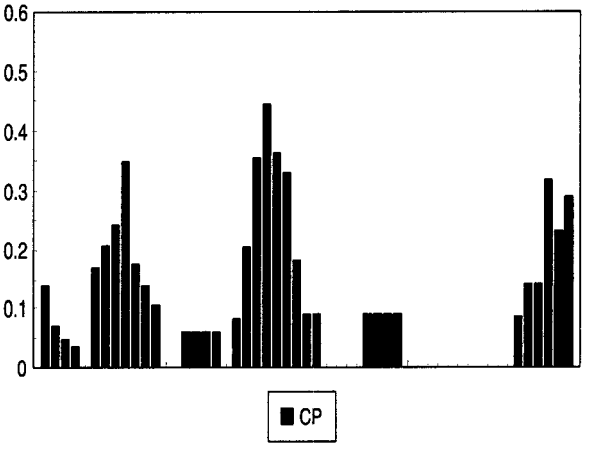


EXHIBIT 4
COMPOSITE MODEL WEIGHTS 1982-1994

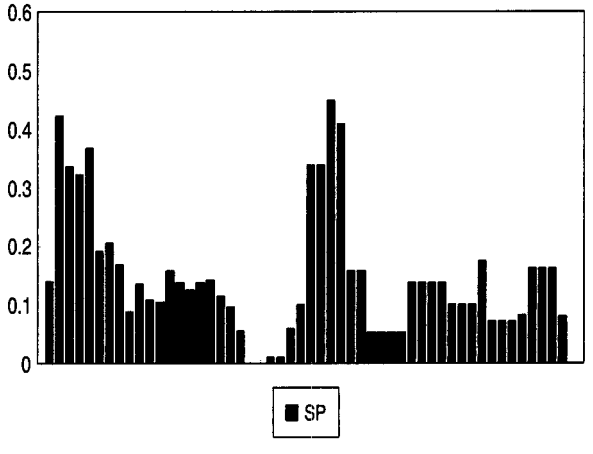


EXHIBIT 5
COMPOSITE MODEL WEIGHTS 1982-1994

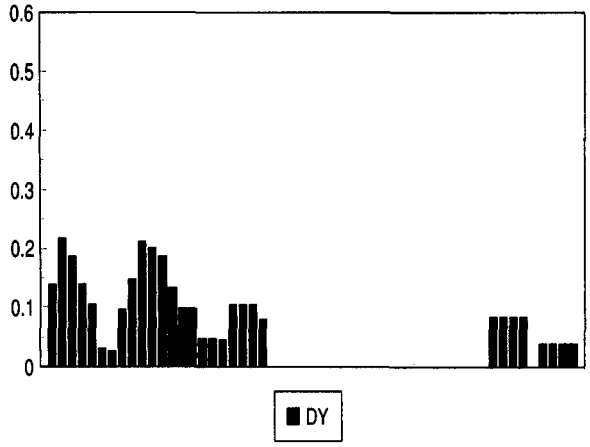


EXHIBIT 6
COMPOSITE MODEL WEIGHTS 1982-1994

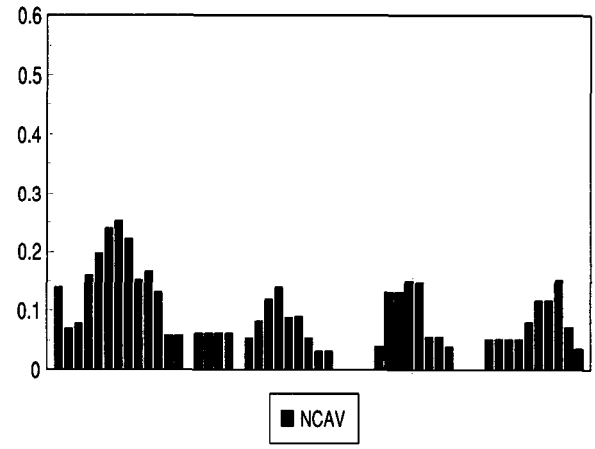


EXHIBIT 7
COMPOSITE MODEL WEIGHTS 1982-1994

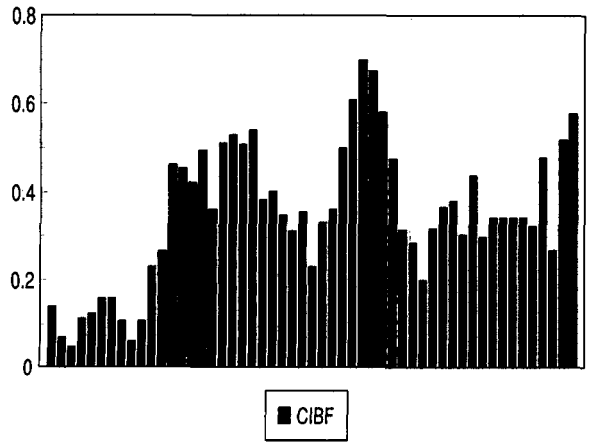
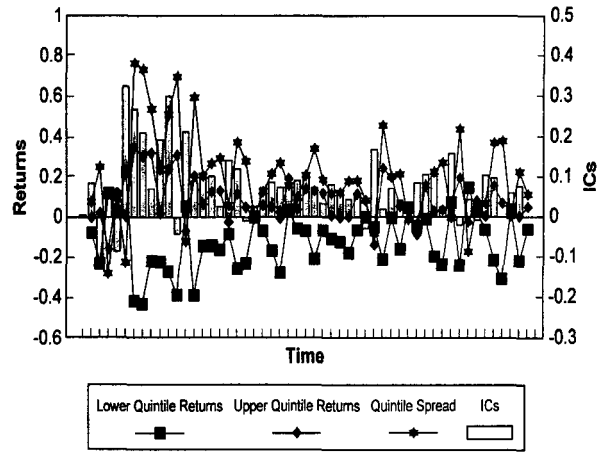


EXHIBIT 8
UPPER QUINTILE RETURNS, SPREADS, AND INFORMATION COEFFICIENTS — TOP 3,000 SECURITIES 1982-1994



information coefficient, measuring the association between the ranked composite model score and subsequent ranked total returns, indicates that the quantitative model is statistically significant in its ranking of securities. The IC is a standard tool used in assessing the predictive power of financial information (see Farrell [1983]).

Guerard, Blin, and Bender [1996b] find that the estimated model outperformed the S&P 500 index by 442 basis points annually during the 1987-1994 period, assuming a 3% upper bound on security weights, transaction costs of 80 basis points each way, and quarterly reoptimization. Guerard, Gultekin, and Stone [1996] find excess returns of approximately 412 basis points annually during the 1982-1994 period using a variation of the model.[8] These two studies use unscreened investment universes.

The estimated expected return ranking model is used to create portfolios during the 1987-1994 period using a socially screened universe. The socially screened universe is created by subtracting the current Domini exclusions from a 1,300 large stock universe, resulting in a screened universe of approximately 950 stocks. A simulation is run for the January 1987-December 1994 period on the socially screened universe in which 1) investment is tightly constrained in a security relative to its weight in the S&P index and in an industry's S&P relative weighting; and 2) a 100-basis point transaction cost (round-trip) is assessed in the simulation.

The estimate composite model produces an average annual return of 15.88% for the 1987-1994

period, while the S&P 500 less its exclusions produces an average annual return of 11.87%.[9] The 401-basis point excess return is consistent with the Guerard, Gultekin, and Stone [1996] and Guerard, Blin, and Bender [1996b] estimations and simulations without any social screening. One can invest in a socially screened portfolio and still outperform the S&P 500 socially screened benchmark.[10]

It is interesting to see how the use of a socially screened universe creates a higher average weight of the proprietary growth variable in the model. The ICs of the composite model may be enhanced as one shifts from a more value-oriented weighting to a more growth-oriented weighting as one forecasts relative factor returns.[11]

SUMMARY AND CONCLUSIONS

The purpose of this study is to show that there has been no statistically significant difference between the average returns of a socially screened and unscreened universe during the 1987-1994 period. Socially conscious investing need not be a dumb idea, but one should be attentive when selecting a socially screened mutual fund or manager. Performance can vary dramatically across managers.

AUTHOR'S UPDATE

Updating the information coefficients (IC) to include the 1995-1996 period, we find again that the regression-weighted model produces virtually identical rankings in socially screened and unscreened universes. The IC of the socially screened universe is 0.112 (t-value of 3.60) for the January 1987-December 1996 period, while the unscreened IC is 0.111 (t-value of 3.92). Remember that the higher t-value of the unscreened universe results from more securities in that universe as opposed to the socially screened universe, with the ICs being approximately equal.

Furthermore, lest one believe that the model has a significant small-stock bias that is difficult to implement, recent research using the estimated model here and the U.S. stocks in the Dow Jones Global Index (DJGI), with approximately 700 U.S. stocks for the January 1991-December 1996 period, finds little predictive differences in the universes. The IC is 0.136 (t-value of 3.43) for the DJGI stocks for 1991-1996, and 0.124 (t-value of 4.37) for the stocks in the Vantage 1,300-stock investment universe.

The initial results using the Dow Jones Global Index U.S. stocks suggest that there is not a pronounced small-size bias. If one applies the KLD screens used in this study to the U.S. stocks in the DJGI, the estimated IC is 0.137 (t-value of 2.93) for the 1991-1996 period. There continues to be no meaningful cost to implementing social screens.

ENDNOTES

[1]The first academic study to find that seventeen socially responsible mutual funds established prior to 1985 outperformed (that is, underperformed less than traditional mutual funds of similar risk for the 1986-1990 period) is Hamilton, Jo, and Statman [1993], although the relative monthly outperformance of 7 basis points is not statistically different from zero, and it is not obvious what criteria were used to determine the socially responsible universe. More recent studies of social screening by Diltz [1995a, 1995b] find no statistically significant difference in returns for twenty-eight stock portfolios generated from a universe of 159 securities during the 1989-1991 period. Diltz finds that only the environmental and military business screens were statistically significant at the 5% level during the 1989-1991 period.

[2]The CREF Social Choice Account was a $1.174 billion account as of December 31, 1995: 61.49% socially screened equities, 37.67% bonds, and 1.72% short-term commercial paper. The CREF Social Choice Account uses screens for environment, weapons, nuclear power, alcohol, tobacco, and gambling products, and the MacBride Principles (a code of fair employment by U.S. firms in Northern Ireland to prevent religious discrimination). It has produced a five-year average annual return of 14.23% for the period ending December 31, 1995, while the CREF Stock Account produced a corresponding five-year average annual return of 15.54%.

The CREF Stock Account is composed of 66% stocks that are representative of the U.S. economy, 17% stocks that are selected for above-average investment potential, and 17% foreign stocks as of December 31, 1995. It is difficult to determine an appropriate benchmark for the CREF Stock Account because of its relative composition, but the five-year Standard & Poor's 500 and Russell 3000 index five-year total returns are 16.6% and 17.4%, respectively, for the period ending December 31, 1995. The CREF Social Choice Account has produced total returns consistent with its balanced performance benchmark and has not substantially underperformed in its equity component.

[3]Fama and French actually test whether higher book-to-price stocks outperform the lower book-to-price stocks. It can be confusing when one thinks of the "low PE" approach of Graham and Dodd [1962], which calls for the purchase of low price-to-earnings stocks (do not purchase a stock that has a price/earnings multiple exceeding 1.5 times the average price/earnings multiple of the market) and the higher earnings yield, or earnings-to-price (EP) approach tested in the academic literature. The two earnings formulations yield roughly the same result when applied to low-PE or high EP decisions (see Guerard and Takano [1992]).

Wall Street traditionally prefers the low-PE and low-PB models; academicians tend to prefer the conventional EP and BP models. This is because the conventional formulations are not plagued by small negative and positive denominators, such as with very small positive and negative earnings, which can create very large positive and negative (often meaningless) PEs. See Graham and Dodd [1962] for long-run evidence supporting the low-PE approach and their mixed thoughts on the price-to-book multiple.

[4]The BARRA growth factor is a predictor of future growth of a company. It is composed of the five-year earnings-to-price ratio, historical earnings growth, recent earnings change, recent IBES change, current earnings-to-price ratio, the IBES earnings-to-

price ratio, and asset growth.

[5]Jacobs and Levy [1988] find substantial rewards for analysts' revisions and residual reversal. Ziemba [1992] finds that last month's residual reversal, the one-year-ahead forecasted earnings per share growth rate, the two-year relative book value, and the low-PE effect are the strongest variables in Japan, and that small stocks outperform large stocks in the U.S. and Japan, particularly in January.

[6]The composite model-weighting scheme is advanced in Guerard [1987] and continues to produce statistically significant rankings. While an infinite number of weighting schemes can be created, the four-period weighted regression pattern produces significant real-time outperformance in the U.S. and Japan during the 1988-1994 period. See Miller, Guerard, and Takano [1992] and Guerard, Takano, and Yamane [1993].

[7]See Montgomery and Peck [1982] for a complete description of the outlier-adjustment process. See also Guerard [1990] and Guerard and Stone [1992].

[8]I have experimented with several variations on the model in joint research with Blin, Bender, Gultekin, Stone, Takano, and Yamane. We briefly examine the average F-statistics and ICs of the various forms of the equation using the top 3,000 securities for the 1982-1994 period. In summary:

1. The BP variable has an average IC of 0.012 (t-value of 0.71), while the EP variable has an average IC of 0.039 (t-value of 2.10), which indicates that the low-PE or high-EP strategy works well in identifying undervalued securities during the 1982-1994 period.
2. The use of relative variables (the relative EP, REP, is the current EP divided by its five-year average of monthly ratios) increases the ICs of the four fundamental variable model (EP, BP, CP, SP) from 0.039 (t-value of 2.17) to 0.042 (t-value of 2.28).
3. The addition of the IBES FY1 forecast and breadth components further increases the IC to 0.072 (t-value of 3.82).
4. The use of the equation in this study produces an equally weighted IC of 0.058 (t-value of 3.15).
5. The Beaton-Tukey robust regression estimation procedure increases the ICs to approximately 0.085, with little difference in the composite model standard errors.

I initially used composite IBES revisions, CIR, and breadth, CIB, in lieu of the CIBF variable.

Model Variables	Average F-Stat.	Average Reg.-Wt. IC(t)	Average Eq.-Wt. IC(t)
EP, BP, REP, RBP, CIR, CIB	18.87	0.066 (2.74)	0.066 (3.52)
EP, BP, CP, SP, REP, RBP, RCP, RSP, CIBF	18.10	0.086 (4.49)	0.058 (3.07)
EP, BP, CP, SP, DY, NCAV, CIBF	28.96	0.083 (4.39)	0.058 (3.15)
EP, BP, CP, SP, DY, NCAV, REP, RBP, RCP, RSP, RDY, RNCAV, CIBF	15.82	0.081 (4.28)	0.068 (3.59)

[9]It is interesting to note that if one uses only the 1,300-stock universe less the social screened stocks as the entire universe, reruns the regressions, and recalculates the expected returns, one finds an average F-statistic of 9.64 in the OLS analysis and 12.4 in the ROB estimations. The average IC of 0.078 is statistically significant, with an average t-value of 3.63. The use of a value-oriented model with the elimination of many smaller stocks does not diminish the IC, but the weighting of the composite growth variable is approximately 0.40. If one equal-weights the seven-factor model, the average IC is 0.027 with a t-value of 0.90; the ranking procedure is not statistically significant in the smaller, socially screened universe. There are positive and statistically significant ICs even using only a larger-capitalized, socially screened universe with application of the Beaton-Tukey estimation procedure.

[10]One socially responsible fund, the Lincoln Life Social Awareness Fund, has produced a net return of 16.40% for the seven years ending March 13, 1996; its socially responsible benchmark, the S&P 500 less its restrictions, has generated 14.62%. T. Scott Wittman, the president of Vantage Global Advisors and the portfolio manager of the Social Awareness Fund, emphasizes a "growth at a reasonable price" (GARP) investment strategy. The model eliminates firms that: 1) engage in activities that damage the natural environment; 2) produce, design, or manufacture nuclear power or equipment for the production of nuclear power; 3) manufacture or contract for military weapons; or 4) are in liquor, tobacco, and gambling industries.

[11]If one believes that BARRA value and growth factor returns can be forecast for the coming quarter using a Box-Jenkins [1976] time series model, a random walk with drift formulation with a seasonal moving-average operator can increase the CIBF weight when the BARRA growth factor return is expected to rise relative to the BARRA value factor return, and increase the predictive power of the model from a monthly IC of 0.052 (t-value of 1.66) to 0.063 (t-value of 1.99) during the 1987-1994 period.

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