
Columbine Capital's Return on Equity Factor

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SUMMARY

- Columbine Capital is adding a new input factor for use in multifactor models: *return on equity*
- Return on equity (ROE) is widely used for measuring a firm's efficiency at generating profits from every unit of shareholders' equity
- Although there are systemic limitations to ROE analysis, it is a useful predictor of individual stock alpha, even across sectors and industries
- Columbine's version of the ROE measure combines two forms: earnings divided by shareholders' equity, and cash flow divided by shareholders' equity
- Companies with the highest rates of return on equity (top decile) tend to produce positive alpha as far as three years out in the future
- Companies with the lowest (negative) rates of return on equity tend to produce significant negative alpha for up to one year, then rebound
- The ROE factor shows good predictive stability over time, performing well in periods that were troublesome for many other factors
- Return on equity is an effective alpha forecaster in nine out of ten economic sectors
- Unlike many other simple factors, ROE tends to perform better in rising than in falling markets
- Although classified as a valuation-oriented measure, the ROE factor's alpha history demonstrates a mix of correlations with the other return factors used in the Columbine models

INTRODUCTION

Effective with this year's model re-optimization Columbine Capital Services is adding a new factor to the catalog of input measures available for use by our domestic models. *Return on equity* (ROE) is a classic measure of a firm's profitability with roots that go back to Benjamin Graham. Reportedly, Warren Buffet considers ROE to be one of the most important factors in making successful stock investments. In our testing we found the measure to be a useful addition to the valuation side of our multifactor models.

What is Return on Equity?

In traditional security analysis *return on equity* measures the rate of return on the ownership interest (shareholders' equity) of the common stock owners. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. Expressed as a percentage, return on equity is calculated by taking a year's worth of earnings and dividing them by the shareholders' average equity for that year:

$$ROE = \frac{Net\ Income}{Shareholders'\ Equity}$$

Interpreting Return on Equity

ROE measures a firm's efficiency at generating profits from every unit of shareholders' equity. It offers a useful signal of financial success since it might indicate whether a company is growing profits without pouring new equity capital into the business. A business that has a high return on equity is more likely to be one that is capable of generating cash internally. For the most part, the market is willing to pay a higher multiple for stocks with higher ROEs.

Further, it turns out that a company cannot grow earnings faster than its current ROE without raising additional cash. That is, a firm with a 10% ROE cannot grow earnings faster than 10% annually without borrowing funds or selling more shares. But either of those courses comes at a cost: debt service cuts into net income, and selling more shares shrinks earning per share by increasing the number of shares outstanding. So ROE is, in effect, a speed limit on a firm's growth rate, leading many portfolio managers to set a ROE hurdle rate (often 15% or higher) when evaluating potential investment candidates.

Limitations of Return on Equity Analysis

There are several circumstances that can affect the utility of return on equity in analyzing the efficiency of a company's profit generation. Most involve actions of the company that reduce the value of shareholders' equity since ROE gets a big boost whenever that value, the denominator in the ROE calculation, goes down.

- *Write-downs* — The reduction in income from a large write-down occurs only in the year that the expense is charged, but it makes a more significant dent in shareholders' equity in the following years. The result is an overall rise in the ROE without any improvement in the company's operations.

- *Share buy-backs* — Like write-downs, buy-backs normally depress shareholders' equity more than they reduce earnings, providing an artificial boost to ROE.
- *Debt* — A company raising more of its funds through borrowing rather than issuing shares. Shareholders' equity is assets less liabilities, so the more debt a company has the less equity it has. The less equity a company has the higher its ROE ratio will be.
- *Intangibles* — GAAP rules normally exclude a company's intangible assets from equity-based calculations. Omitting things like trademarks, brand names, and patents can understate shareholders' equity in relation to its value, distorting the ROE calculation.
- *Industry differences* — Some industries, such as consulting firms, normally have high rates of ROE because they require no assets. Others require large infrastructure builds before they generate a penny of profit (oil refiners, for example). ROE alone cannot tell us that consultants are better investments than refiners.

Despite these limitations our historical testing confirms that return on equity is a useful predictor of individual stock alpha, even across sectors and industries. It meets our two-part factor selection criterion of demonstrating useful forecasting ability on its own and of being based on a concept that makes economic sense. Used by itself the ROE metric is not a generator of high levels of alpha. But when offered to our *gradient maximization* optimization methodology the factor ends up receiving substantial weightings in our multifactor models, indicating a synergistic effect in generating risk-adjusted alpha.

COLUMBINE CAPITAL'S RETURN ON EQUITY FACTOR

The formulation of the return on equity measure we have developed combines two slightly different calculations into a single ROE metric. The first variant is the classic formulation, computed using per-share data:

$$ROE_1 = \frac{E}{BV}$$

Where:

E = latest trailing four-quarter earnings per share

BV = latest book value per share

The *book value per share* data item we receive from our US data provider, Thomson Reuters Baseline, is defined as the latest common equity divided by the number of shares outstanding, making book value the per-share equivalent of shareholders' equity at the financial statement level. We tried adding the book value figures from both the beginning and end of the four quarters of earnings and dividing by two to arrive at an average value corresponding to the time period represented by the earnings generation. This formulation proved less predictive of future alpha than simply using the most recent book value figure.

In the second ROE variant we have modified the numerator, substituting a measure of cash flow in place of ordinary income:

$$ROE_2 = \frac{E - D + DEP}{BV}$$

Where:

E = latest trailing four-quarter earnings per share

D = latest trailing twelve-month dividends per share

DEP = latest depreciation per share

BV = latest book value per share

Our Columbine Capital ROE factor formulation combines these two versions of the measure to produce a single ROE percentage rate. We use this value to sort the stocks of our *Columbine 1500 Universe* from the highest to the lowest rate. The 10% of stocks with the highest ROE rate are assigned to the ROE factor's 1st decile, and the 10% of stocks with the lowest ROE rate are assigned to the 10th decile. For stocks outside the *Columbine 1500* we assign ROE factor rankings based on where their ROE rate would place them relative to the benchmark *Columbine 1500 Universe* scoring.

Although our algorithm will compute an ROE value for companies with negative earnings or negative book value, we exclude any companies with negatives on both inputs. Such double-negative companies receive a ranking of "NA" since a negative divided by a negative would give us a positive quotient—clearly not a meaningful result for a money-losing company with liabilities greater than its assets.

RETURN ON EQUITY FACTOR CHARACTERISTICS

All of the analysis discussed below is based on our testing of the 2010 version of the Columbine return on equity factor in the stocks of our *Columbine 1500 Universe* over the years 1971 through 2009. We computed month-end rankings for the ROE factor for all stocks in the test universe based on contemporaneous company and market data. Unless otherwise noted, all returns are equal-weighted and gross of transactions costs. Reported alphas represent the excess return from subtracting the return of the *Columbine 1500 Universe* from the factor's return over the same period.

Decile Alphas

The average alphas (annualized) generated by each decile of the Columbine ROE factor at a one-month holding period are displayed in **Figure 1**. As noted earlier, compared with some other factors the ROE factor does not produce large alphas from its high-ranked deciles, but there are modest positive alphas on average for the 1st through the 7th deciles, with the alphas turning negative in the 8th decile. The bottom (10th) decile (lowest or negative rate of return on equity) produces a significant negative alpha on average. Decile-by-decile average alphas for all holding periods are reported in **Appendix I**.

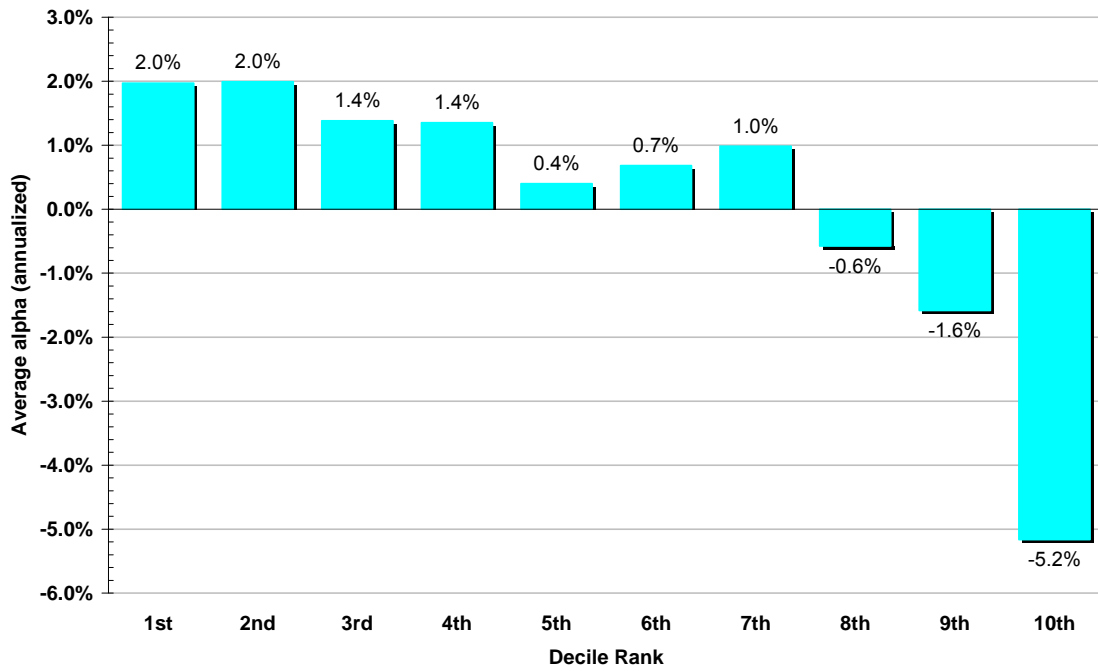


Figure 1. Average alpha by ROE decile: 1971–2009

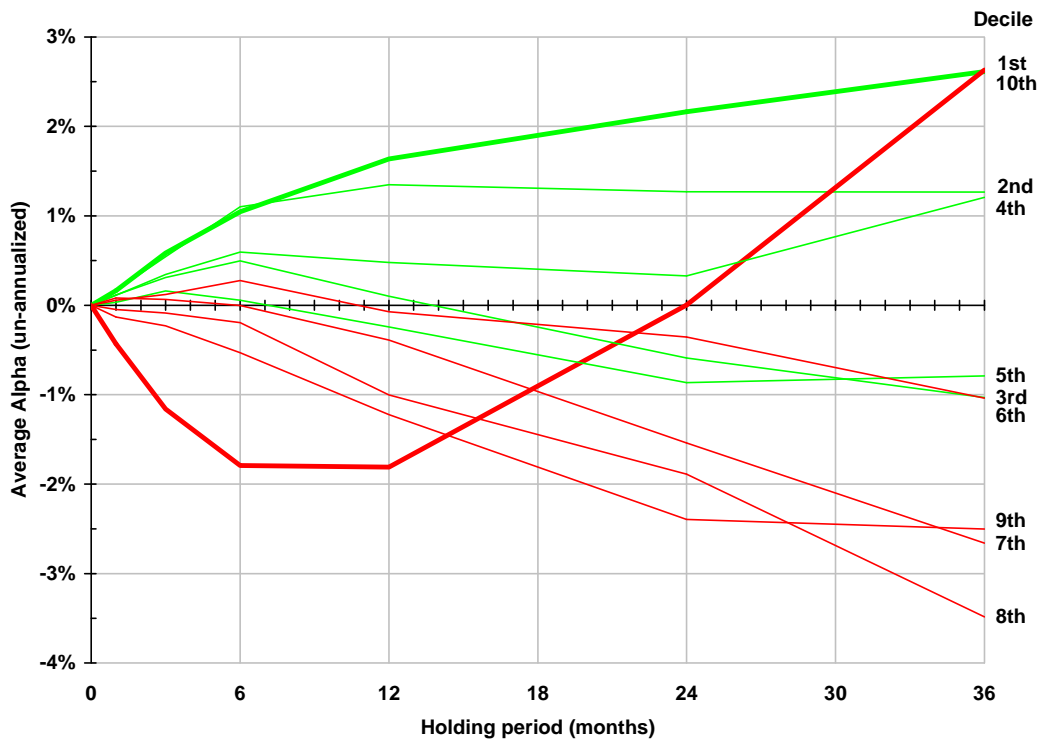


Figure 2. Average ROE decile buy-and-hold alpha by holding period: 1971-2009

Figure 2 illustrates the average alphas generated by the ROE factor deciles at holding periods of one, three, six, twelve, twenty-four, and thirty-six months on an un-rebalanced (buy-and-hold) basis. Two points immediately stand out: 1) Stocks in the top (1st) decile continue to add positive alpha all the way out to a holding period of three years. This means that those companies with the highest rate of return on equity in a given month are likely to have significantly better-than-market stock returns as much as three years later. 2) The average alpha of the stocks in the bottom (10th) decile starts out negative, flattens after six months, and then turns upward after one year, ending with an average positive alpha about the same as the top decile after three years.

In other words, after three years the companies with the *worst* rates of return on equity end up generating about the same level of positive alpha as the companies with the *best* rates of ROE. The difference is in the path they take to get to that point. Low or negative ROE firms seem to experience a bounce-back in stock return starting at about one year, but the high ROE firms show a steadier progression of positive alpha generation. For the purposes of a multifactor alpha-forecasting model intended for institutional long-only portfolios, the ROE factor looks like a useful input despite this bottom decile performance. Its only limitation would be for use in a long-term shorting strategy where the bottom decile bounce could be a significant drawback.

Time Series

The ROE factor's forecasting ability shows good stability over time. **Figure 3** illustrates the cumulative monthly alpha from the factor's top and bottom decile across the entire 39 years of the test database. The annualized rate of alpha was +1.82% for the top

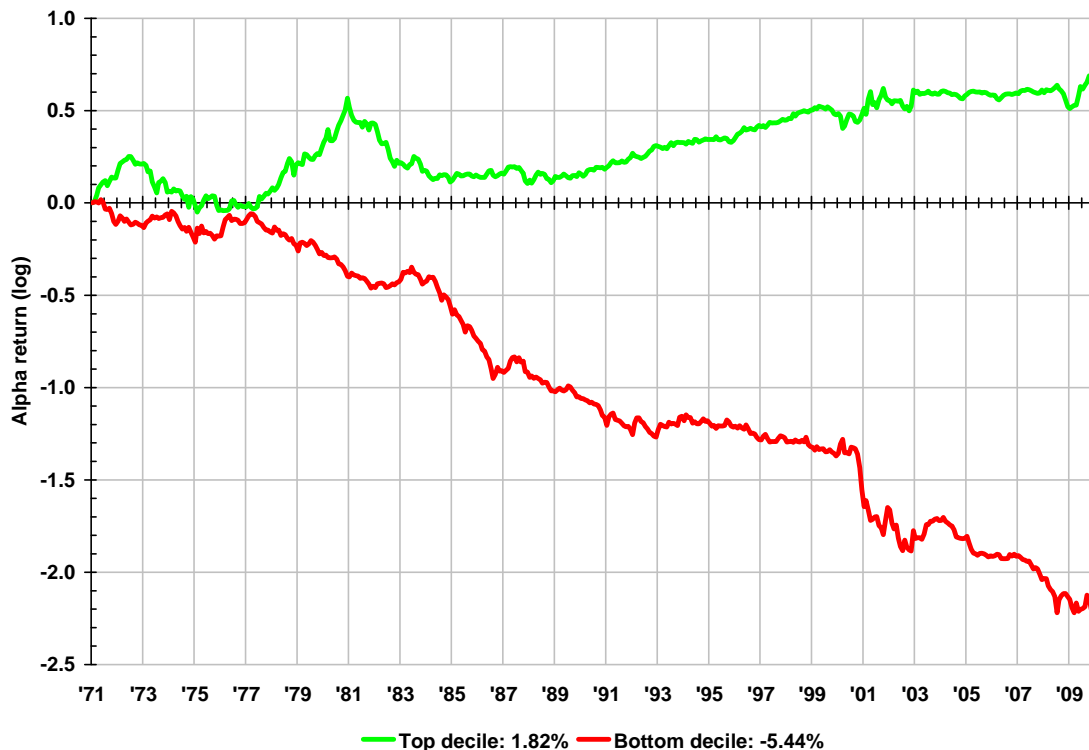


Figure 3. Cumulative monthly alpha

decile and -5.44% for the bottom decile. If we look at the factor's top-bottom spread as a long-short portfolio its maximum drawdown (-36%) would have been between January of 1981 and March of 1984.

Figure 4 reports the average annual top- minus bottom-decile spread return based on one-month holding periods. As with any return factor there are good and bad years, but there is no apparent systematic diminution in discriminatory ability across the years. The factor had a hard time in the mid-70s, and again in the early 80s. ROE weathered the Technology bubble years of the 90s well and even generated its best-ever top-bottom spread in 2000 after the bubble burst. Similarly, it performed acceptably in 2008 and did quite well in 2009 when many other factors suffered badly.

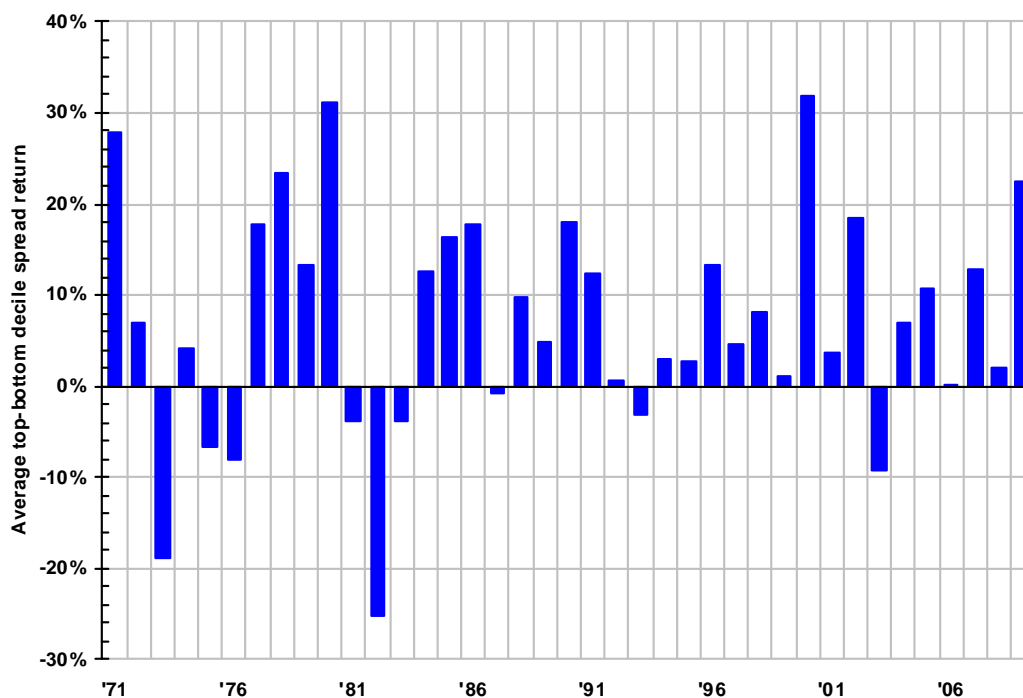


Figure 4. Average annual top-bottom ROE decile spread

Over the entire thirty-nine years of the test period the ROE factor's top decile succeeded (generated positive alpha) in just over 52% of the months, while its bottom decile performed correctly (generated negative alpha) in about 62% of the months. As you might expect, the top-bottom decile spread return's success rate was in between those numbers at 58.5%. The longest continuous run of successful (positive alpha) performance from the ROE factor's top decile was seven months, and twelve months for both the bottom decile and the spread return. The longest continuous run of top decile failure from the factor was six months: July through December of 2008.

Table 1 reports the ROE factor's ten best- and worst-performing months for top decile alpha, bottom decile alpha, and the top-bottom decile spread return.

Table 1. Return on Equity Factor's Ten Best- and Worst-Performing Months**TEN BEST MONTHS**

TOP DECILE			BOTTOM DECILE			TOP-BOTTOM SPREAD		
RANK	ALPHA	MONTH	RANK	ALPHA	MONTH	RANK	RETURN	MONTH
1	9.24	Nov-02	1	-11.27	Nov-00	1	14.17	Nov-00
2	8.56	Feb-01	2	-8.70	Dec-00	2	13.59	Feb-01
3	6.53	Nov-80	3	-8.36	Jun-08	3	12.27	Dec-00
4	5.97	Mar-79	4	-7.09	Oct-00	4	9.65	Jun-08
5	5.95	Oct-74	5	-7.07	Mar-00	5	9.60	Nov-80
6	5.83	Jul-73	6	-7.00	Jan-02	6	9.47	Apr-09
7	5.78	Nov-78	7	-6.84	Apr-02	7	9.42	Mar-01
8	5.57	Jun-77	8	-5.48	Oct-87	8	9.37	Jul-01
9	5.19	May-09	9	-5.47	Oct-09	9	8.55	Oct-74
10	5.16	Apr-09	10	-5.36	Mar-01	10	8.40	Oct-00

TEN WORST MONTHS

TOP DECILE			BOTTOM DECILE			TOP-BOTTOM SPREAD		
RANK	ALPHA	MONTH	RANK	ALPHA	MONTH	RANK	RETURN	MONTH
468	-7.12	Oct-78	468	11.72	Nov-02	468	-12.82	Oct-01
467	-6.78	Apr-01	467	8.24	Oct-01	467	-11.25	Jan-75
466	-6.48	Feb-00	466	7.95	Jan-75	466	-9.18	Jul-08
465	-5.83	Sep-74	465	7.31	Jul-08	465	-9.12	Feb-00
464	-5.77	Apr-73	464	7.08	Nov-01	464	-8.77	Nov-01
463	-5.74	Mar-80	463	6.59	Jan-92	463	-8.07	Sep-74
462	-5.11	Nov-73	462	6.57	Aug-09	462	-8.02	Jan-92
461	-4.96	Oct-75	461	5.86	Jul-02	461	-7.78	Apr-73
460	-4.91	Dec-80	460	5.38	Mar-09	460	-7.33	Jul-02
459	-4.81	Jul-82	459	5.23	May-03	459	-7.27	Apr-01

Both the best and worst lists include months from the twenty-first century and from as far back as the early 1970s, suggesting that the factor's return distribution has not changed significantly across the years.

Economic Sector Sensitivity

As noted above, typical rates of return on equity can be expected to vary by industry depending on differences in their required asset base and other systemic disparities. Despite this conceptual concern, our testing shows that ROE is an effective alpha forecaster in almost all economic sectors. **Figure 5** reports the average alpha generated by the top and bottom deciles of the return on equity factor in sectors. For this analysis each economic sector is treated as a separate test universe and the ROE factor is used to decile stocks within that sector relative to the sector rather than relative to all stocks. The results shown in the figure are a composite of the alphas produced in each sector's stocks at holding periods of one, three, six, and twelve months. (Individual holding period results for all sectors are reported in **Appendix II**.)

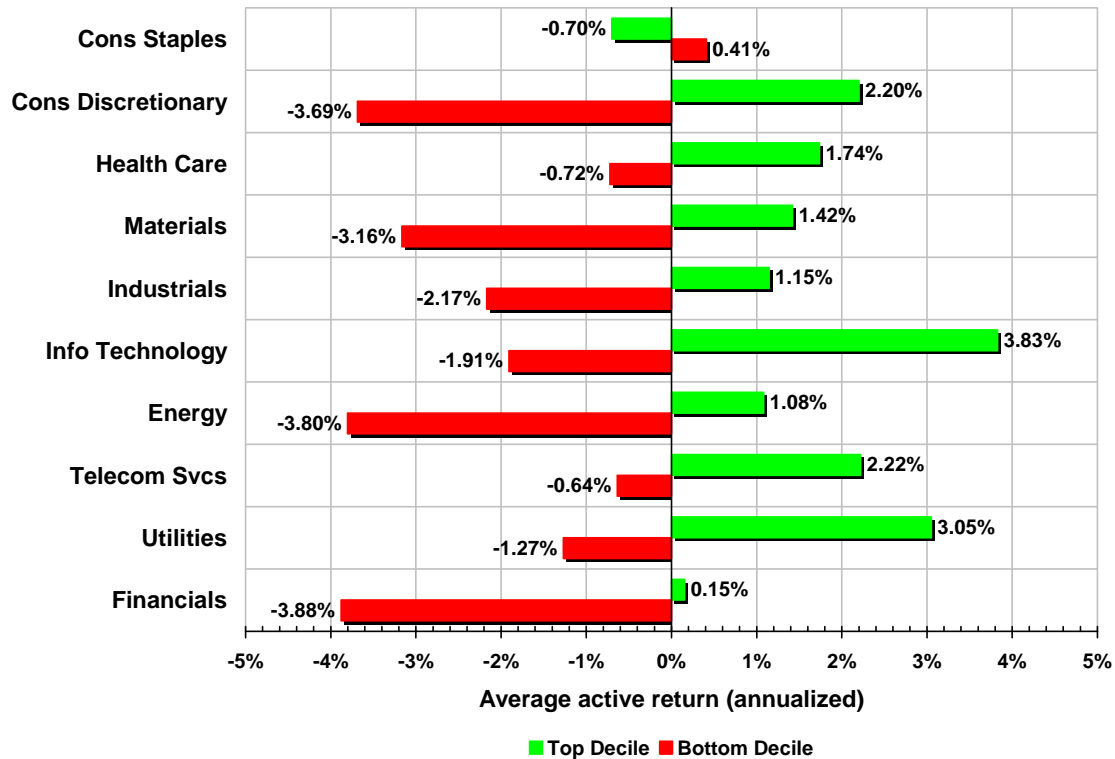


Figure 5. Average alpha by economic sector: 1971-2009

The figure makes clear that, while there are differences in ROE's predictive ability across different sectors, the only problem area is the Consumer Staples sector where the decile alphas are inverted (top decile underperforms, bottom decile outperforms). However, the ROE alphas in that sector generally are small compared to the alphas generated in the other sectors. In the short term the Consumer Staples inversion could just as well be characterized as flat or zero alpha results. At longer holding periods—twelve, twenty-four, and thirty-six months—the top decile of the ROE factor does generate positive alphas in Consumer Staples, though the bottom decile does as well.

Biases

The ROE factor definitely displays sensitivity to market direction and macroeconomic conditions. **Figure 6** illustrates the average monthly alphas generated by the factor's top and bottom deciles in up and down markets, periods of economic recession or expansion, and in periods of rising or falling interest rates (ST = short-term rates, LT = long-term rates). When markets are rising the factor's top decile produces better than average positive alphas, but the bottom decile is flat. Conversely, in falling markets both the top and bottom deciles tend to underperform the universe, with the bottom decile generating more than double its overall average negative alpha.

Like other valuation-oriented factors, the discriminatory ability of the return on equity factor is positively correlated with market volatility as measured by the VIX. You can expect top-bottom spread returns from ROE to increase as market volatility rises. However, the volatility of those ROE spreads also increases with the VIX level, so on a

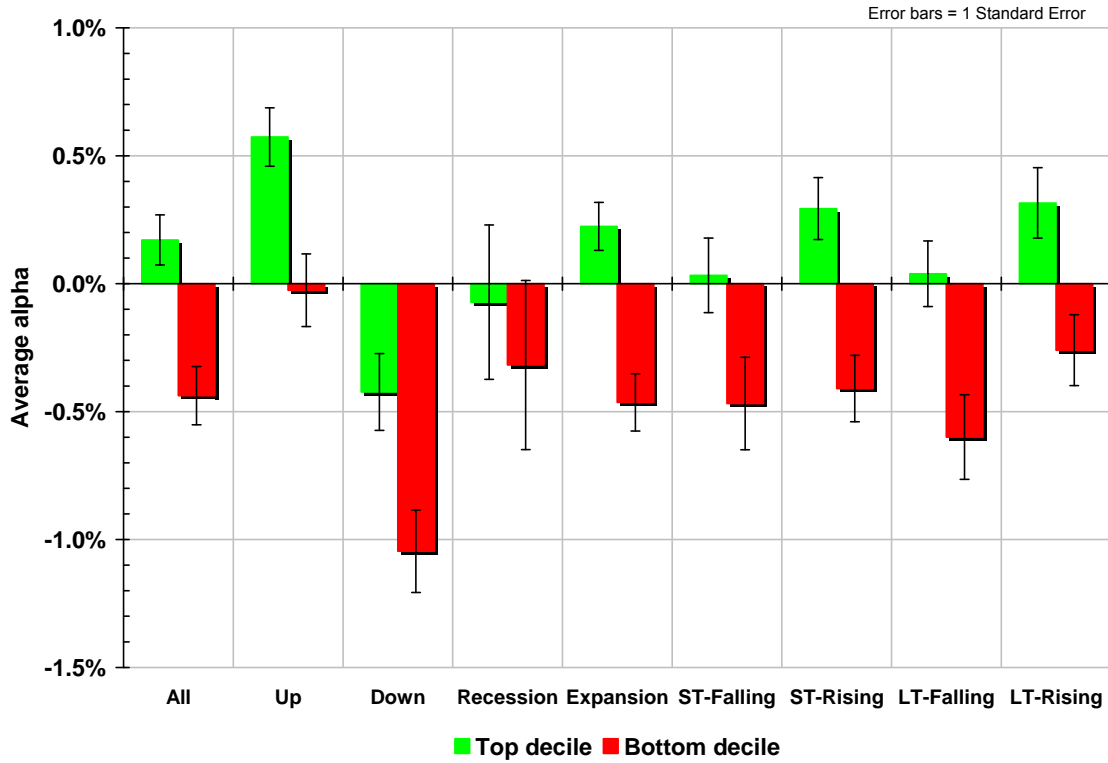


Figure 6. Market and macroeconomic sensitivity: 1971-2009

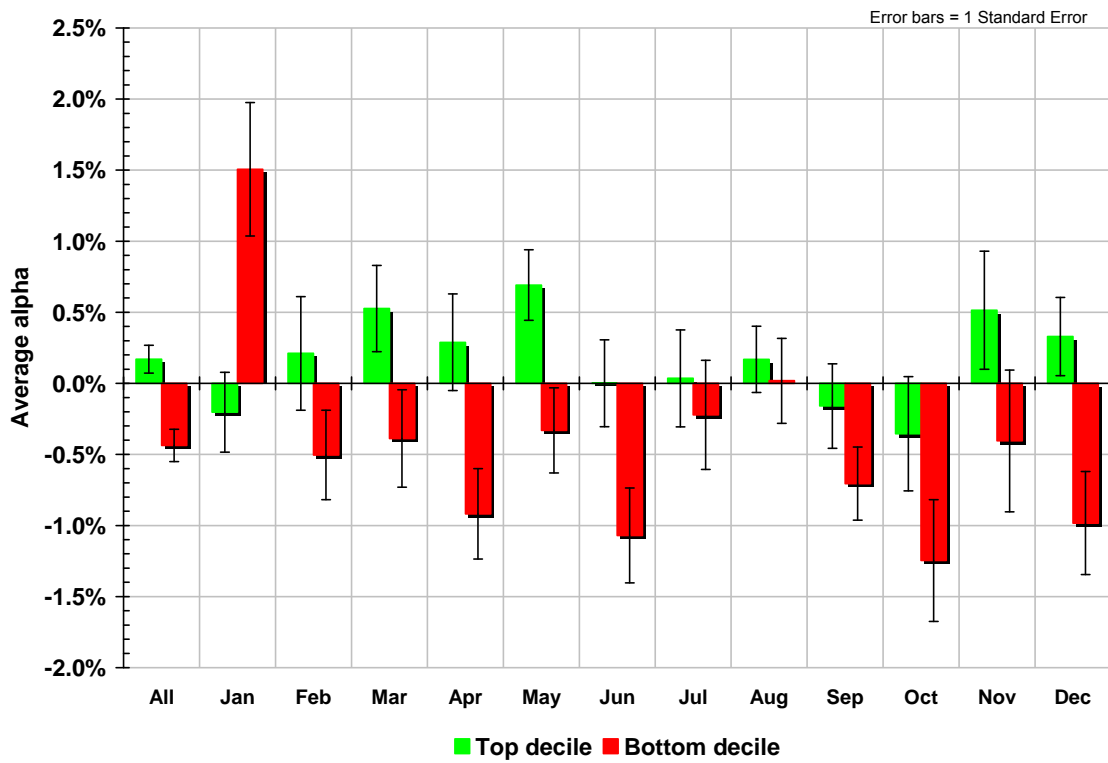


Figure 7. Average alpha by calendar month: 1971-2009

risk-adjusted basis there's little improvement in spread return during periods of high market volatility.

On a macroeconomic level the return on equity factor seems to do better at identifying attractive (top decile) stocks in economic expansions, and generates its largest top-bottom decile spreads in those periods as well. Bottom deciles of the ROE factor do not appear to be sensitive to interest rates, but the top decile is much more effective in rising-rate environments.

On a calendar month basis the ROE factor exhibits an anomaly similar to that of price momentum—a January effect. **Figure 7** reports the average monthly alpha produced by the factor's top and bottom deciles in each month. The factor's top decile alpha averages slightly less than zero in January, but its bottom decile produces a positive average alpha of around 1.5%, resulting in a negative average top-bottom spread for the month. Just as with price momentum, we believe this is primarily a consequence of the January small-cap reversal. The scale of the January reversal in ROE, however, is much smaller than what we have observed in price momentum. Zero-weighting ROE at year-end or taking similar steps to alleviate the effect does not appear to be worth the resulting turnover increase.

Relationship to Other Factors

Although we have chosen to characterize the return on equity factor as a valuation-oriented factor, its correlations with the returns of other input factors vary quite widely. **Table 2** reports the correlation coefficients between the monthly decile alphas of the return on equity factor and our other standard return factors.

Table 2. Correlation Coefficients — ROE vs. Factors: 1971-2009

Momentum Factors	Top Decile	Bottom Decile	Spread
Price Momentum	0.004	0.627	0.161
Industry Momentum	-0.130	0.306	0.255
Earnings Surprise	-0.090	0.291	-0.013
Estimate Revision	-0.247	0.554	0.104
Earnings Change	0.485	0.594	0.355
Earnings Growth	0.528	0.604	0.489
Valuation Factors	Top Decile	Bottom Decile	Spread
Book Value	0.398	0.130	-0.172
Cash Flow	0.394	0.482	0.361
Dividend Yield	-0.477	0.681	-0.018
Reported EPS Yield	0.210	0.600	0.334
Estimated EPS Yield	0.303	0.687	0.532

The valuation characterization clearly seems appropriate based on the top decile correlations. The ROE factor's correlation is negative with three of the momentum factors' alphas and virtually zero with price momentum. The top decile alphas of earnings change and earnings growth factors have strong positive correlations with ROE's top decile, but those two measures are hybrid momentum/valuation measures since they both have price in the denominator of their calculation. On the valuation side the ROE factor's top decile alphas produce significant positive correlations with those of four of

the five valuation factors. Dividend yield seems to be the odd man out, with a robust negative correlation with ROE top decile alphas.

The bottom decile of alphas from return on equity presents a correlation puzzle. It is positively correlated with the bottom decile alphas of both momentum and valuation factors. Given that circumstance it is not surprising that the top-bottom decile spread returns from the ROE factor represent something of a mixed bag of correlations when compared to the other return factors.

A factor with such a variety of correlations with other factors is a beneficial input into multifactor alpha forecasting models since it can have the synergistic effect of reducing volatility and improving return. Based on the ROE factor's top decile correlations we decided its best fit was with other valuation measures and we are including it in the 2010 version of the *Columbine Valuation Model*.

CONCLUSION

Return on equity, as measured by the Columbine ROE factor, is based on a financial concept that makes intuitive sense, and has shown utility in forecasting individual stock alphas over time periods that are useful in institutional portfolio strategies. The factor has displayed beneficial levels of predictive ability, often during periods that were difficult for many other return factors. Our initial work with ROE has made it clear that the factor can add value in a multifactor modeling context. We will be making the Columbine return on equity factor available to our gradient maximization optimization process as we re-optimize all the Columbine Capital multifactor models for 2010.

Columbine Capital Services, Inc.

Average Annual Alpha Analysis

Model: Return on Equity Factor
Version: 2010
Universe: Columbine 1500
Issues: 1500
Test period: 1971-2009

Dividends included: Yes
Weighting: Equal
Costs: None
Currency: US

1-month holding period--annualized

Average Information Coefficient: 0.019

Year	Decile rank:										Decile Spread
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
1971	17.65	8.84	7.29	1.73	-1.91	-5.48	-0.71	-1.20	0.36	-10.27	27.92
1972	3.45	2.13	6.09	4.20	-4.89	-4.16	-6.51	-2.44	-2.92	-3.51	6.95
1973	-14.59	-1.81	-3.47	-3.94	0.32	-1.38	-2.52	3.75	1.88	4.39	-18.98
1974	-7.43	7.53	-2.54	4.12	0.94	10.53	6.76	8.59	-1.15	-11.55	4.12
1975	-0.74	-3.92	3.22	2.94	1.70	4.46	5.40	10.60	6.62	5.93	-6.67
1976	4.14	-1.06	-3.86	-2.52	-2.37	-0.85	0.13	4.77	3.95	12.19	-8.05
1977	10.57	3.16	1.76	-2.47	-1.39	-1.15	0.83	-1.45	-1.91	-7.12	17.68
1978	13.84	1.98	2.76	2.84	3.61	-1.62	-6.64	-6.57	-6.16	-9.61	23.45
1979	11.48	13.52	4.91	5.35	0.31	-1.72	-3.79	-7.76	-8.06	-1.73	13.22
1980	20.00	17.90	7.83	5.75	-0.27	-2.42	-3.80	-6.07	-12.43	-11.17	31.17
1981	-9.44	-15.90	-2.79	-3.64	-3.00	5.42	4.53	2.91	6.75	-5.58	-3.86
1982	-20.29	-8.22	1.19	6.66	3.02	1.27	7.52	4.42	6.03	4.79	-25.07
1983	-4.56	-1.60	-4.47	-3.49	1.18	-0.38	-0.74	-0.17	3.93	-0.81	-3.75
1984	-4.83	-1.78	0.62	3.54	1.02	3.73	1.66	-0.45	-9.98	-17.43	12.60
1985	2.47	-0.05	3.59	0.74	1.09	-1.09	0.36	-0.03	-8.47	-13.82	16.29
1986	1.15	9.31	4.27	2.42	3.98	5.16	0.81	0.90	-4.53	-16.67	17.82
1987	-2.98	1.69	0.24	3.93	2.20	4.98	1.19	-0.25	4.45	-2.20	-0.78
1988	2.20	-4.36	2.13	0.70	-1.86	1.21	4.06	2.35	1.74	-7.65	9.85
1989	1.30	6.10	1.60	4.26	-2.16	-0.68	2.91	-1.38	-0.08	-3.52	4.82
1990	4.03	11.02	6.39	8.19	4.35	5.22	10.58	3.43	-2.91	-14.06	18.08
1991	7.80	0.82	-1.41	0.90	-0.82	1.31	-5.00	-7.19	-6.00	-4.56	12.36
1992	3.85	-3.87	-2.63	-2.10	-4.84	-2.00	-1.98	-2.09	2.38	3.23	0.63
1993	1.93	-2.89	-4.64	-3.42	-2.07	0.53	2.32	-0.35	5.11	5.07	-3.14
1994	1.56	-2.10	4.62	-2.84	-1.24	0.46	0.78	-2.45	-0.75	-1.44	2.99
1995	1.09	4.76	0.25	1.97	-2.26	2.03	-4.94	-5.33	-6.41	-1.72	2.82
1996	5.80	-2.47	2.49	-0.64	3.19	0.01	-2.05	-0.98	-0.65	-7.52	13.32
1997	3.66	-6.59	3.07	-0.89	-0.84	-4.44	0.41	0.50	3.38	-1.08	4.74
1998	8.51	7.69	3.36	4.17	8.57	1.89	6.27	0.51	1.06	0.34	8.16
1999	-1.61	-2.87	-5.41	-1.82	2.69	-1.00	-1.21	2.84	-2.19	-2.80	1.19
2000	2.61	0.11	6.98	6.62	1.72	1.04	10.93	-3.93	-2.69	-29.35	31.96
2001	6.31	9.81	-0.68	8.28	8.16	-1.95	11.84	15.43	0.98	2.61	3.70
2002	6.54	9.13	2.15	6.25	7.74	5.54	1.93	3.93	-5.71	-11.85	18.39
2003	0.73	0.80	-4.30	0.71	-4.67	-0.13	-0.70	-6.05	2.54	10.00	-9.27
2004	-1.53	7.50	0.34	2.09	1.44	2.20	0.70	-4.87	-0.54	-8.51	6.97
2005	-0.16	8.45	0.35	-0.62	1.58	-3.12	2.30	-3.67	0.56	-10.79	10.63
2006	0.65	2.79	5.16	-2.25	4.53	-0.81	-2.19	-4.48	-2.55	0.45	0.20
2007	0.59	6.72	9.31	1.99	-2.57	3.42	2.00	-1.75	-4.18	-12.17	12.76
2008	-8.28	-2.97	3.49	4.14	-1.48	9.54	5.95	1.11	2.15	-10.31	2.03
2009	19.52	5.91	2.13	-2.48	-1.86	-2.20	-3.38	-5.82	-15.44	-2.99	22.51
Mean	1.97	1.99	1.38	1.35	0.40	0.68	0.98	-0.57	-1.58	-5.17	7.14
Std Dev	7.77	6.70	3.90	3.55	3.39	3.33	4.56	4.96	4.75	8.38	12.52
Std Err	1.24	1.07	0.63	0.57	0.54	0.53	0.73	0.79	0.76	1.34	2.00
t-stat	1.54	1.81	2.15	2.32	0.72	1.25	1.31	-0.71	-2.02	-3.75	3.47
IR	0.25	0.30	0.35	0.38	0.12	0.21	0.22	-0.12	-0.33	-0.62	0.57

Columbine Capital Services, Inc.

Average Annual Alpha Analysis

Model: Return on Equity Factor
Version: 2010
Universe: Columbine 1500
Issues: 1500
Test period: 1971-2009

Dividends included: Yes
Weighting: Equal
Costs: None
Currency: US

3-month holding period--annualized

Average Information Coefficient: 0.024

Year	Decile rank:										Decile Spread
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
1971	20.22	9.21	9.42	3.42	-0.81	-5.13	-0.24	0.05	-0.01	-6.73	26.95
1972	-1.49	0.33	5.38	4.15	-5.76	-2.79	-7.30	-3.28	-3.86	-2.79	1.30
1973	-11.92	-4.02	-4.84	-1.12	-2.25	-0.04	-1.94	4.40	4.58	7.13	-19.04
1974	-9.71	3.55	-2.35	5.48	1.93	8.56	7.63	7.32	2.07	-9.51	-0.19
1975	1.04	-0.56	5.63	1.28	1.62	0.67	5.18	7.64	7.49	3.89	-2.85
1976	3.55	-1.33	-6.74	-1.97	-3.45	-0.44	-0.40	2.08	2.49	7.93	-4.38
1977	8.49	1.93	-0.30	-2.19	-1.27	0.42	-0.65	-1.69	1.17	-7.16	15.65
1978	11.77	4.64	1.54	2.61	3.20	-0.67	-4.67	-4.36	-6.03	-7.18	18.95
1979	15.39	17.22	7.02	5.43	1.95	-2.52	-5.33	-9.30	-11.22	-5.48	20.88
1980	14.42	10.54	3.46	4.70	-2.37	0.50	-4.00	-4.99	-7.41	-10.44	24.86
1981	-10.19	-13.41	-5.33	-2.37	-0.49	3.85	8.25	3.38	8.72	-4.35	-5.84
1982	-16.24	-4.72	-0.52	5.46	2.78	0.58	2.91	5.29	5.05	8.33	-24.57
1983	-5.39	-4.61	-3.27	-1.04	-0.84	-0.75	-0.45	-1.74	2.58	-0.67	-4.72
1984	-1.13	3.96	-0.84	4.08	2.55	2.17	0.64	-2.08	-8.69	-18.19	17.06
1985	0.25	-0.87	1.53	-0.95	-0.38	1.12	1.32	1.40	-7.29	-16.63	16.89
1986	5.35	11.24	4.77	2.26	5.72	4.52	-0.87	-0.50	-4.76	-12.46	17.81
1987	-4.64	-0.02	1.63	1.62	0.28	3.75	0.68	1.67	5.95	-0.34	-4.30
1988	2.83	-4.02	0.51	1.95	-1.45	1.16	2.24	2.75	1.73	-5.97	8.79
1989	3.55	4.05	1.38	3.29	-2.15	-1.03	1.58	1.93	-1.33	-5.28	8.83
1990	5.04	10.97	8.87	7.38	1.67	4.79	2.61	1.84	-4.54	-8.94	13.98
1991	4.80	-0.27	-4.23	-0.31	-0.96	-2.42	-4.64	-4.86	-4.19	-2.36	7.16
1992	3.64	-3.74	-2.23	-1.81	-2.65	-4.21	-1.16	-1.54	1.72	0.39	3.25
1993	1.93	-2.64	-3.81	-4.19	-2.52	1.41	1.04	-1.11	4.88	8.20	-6.27
1994	1.52	-1.37	3.58	-1.99	2.43	0.00	0.09	-0.19	-0.14	-3.35	4.87
1995	0.93	5.87	-0.99	0.31	-1.37	-1.88	-4.54	-6.39	-3.79	-1.14	2.07
1996	4.78	-1.21	1.47	-1.52	2.97	-0.83	-2.50	-0.30	0.56	-6.58	11.35
1997	3.94	-1.51	2.46	-1.52	-0.84	-3.82	-0.44	-1.10	2.46	-1.08	5.01
1998	7.86	5.37	3.25	1.14	8.49	1.25	0.96	3.44	0.54	1.22	6.64
1999	-4.22	-6.69	-3.14	0.11	0.32	-1.69	-1.27	3.48	1.15	1.11	-5.33
2000	6.43	3.03	9.52	8.24	7.32	2.27	10.02	-0.82	-1.63	-22.52	28.95
2001	11.27	11.91	5.19	7.71	6.94	5.60	10.68	11.11	1.42	-12.87	24.14
2002	7.41	7.24	1.56	5.84	7.35	1.48	-0.36	3.00	-0.47	-10.68	18.09
2003	0.97	-0.87	-3.63	-0.01	-2.99	0.27	0.18	-5.73	0.16	10.43	-9.47
2004	-1.00	9.24	2.32	3.39	3.35	1.56	-1.25	-4.00	-2.58	-12.50	11.50
2005	-0.19	7.94	-0.08	-2.15	1.30	-3.11	2.36	-0.51	1.15	-5.09	4.91
2006	3.47	3.22	4.24	-0.16	1.91	-0.16	-1.35	-5.74	-3.17	-1.52	4.99
2007	0.85	5.57	6.56	1.04	-1.98	4.28	2.65	-2.02	-3.75	-10.50	11.35
2008	-4.92	-2.13	4.55	2.05	-0.11	7.41	2.58	3.61	0.42	-11.73	6.82
2009	17.86	6.21	-0.08	0.19	-0.76	-3.45	-4.91	-8.79	-12.02	-0.94	18.80
Mean	2.34	2.17	1.24	1.38	0.64	0.48	0.26	-0.35	-0.93	-4.64	6.98
Std Dev	7.48	6.24	4.25	3.25	3.34	2.91	4.01	4.28	4.52	7.65	12.39
Std Err	1.20	1.00	0.68	0.52	0.53	0.47	0.64	0.68	0.72	1.23	1.98
t-stat	1.90	2.12	1.78	2.59	1.17	1.01	0.39	-0.49	-1.25	-3.69	3.43
IR	0.31	0.35	0.29	0.43	0.19	0.17	0.06	-0.08	-0.20	-0.61	0.56

Columbine Capital Services, Inc.

Average Annual Alpha Analysis

Model: Return on Equity Factor
Version: 2010
Universe: Columbine 1500
Issues: 1500
Test period: 1971-2009

Dividends included: Yes
Weighting: Equal
Costs: None
Currency: US

6-month holding period--annualized

Average Information Coefficient: 0.027

Year	Decile rank:										Decile Spread
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
1971	19.73	9.25	8.12	4.26	-0.78	-3.07	-2.49	1.09	-0.15	-6.32	26.04
1972	-5.95	-1.14	1.97	2.71	-2.76	-1.10	-6.97	-2.15	-1.96	-0.56	-5.39
1973	-8.93	-3.03	-4.19	-1.77	-2.01	0.21	-1.69	4.61	5.45	5.31	-14.24
1974	-7.56	1.53	-0.48	4.99	2.66	7.75	6.87	4.14	3.80	-4.02	-3.54
1975	-1.22	-1.25	1.81	0.47	-0.95	0.93	3.21	8.03	8.51	6.03	-7.25
1976	1.66	-1.09	-6.89	-2.40	-2.97	1.22	0.94	2.25	2.44	3.13	-1.47
1977	9.88	4.08	-1.56	-0.15	-0.86	-0.26	-1.37	-3.54	-1.16	-4.20	14.08
1978	10.07	7.89	1.11	2.50	2.28	-1.69	-3.76	-3.67	-4.74	-5.71	15.78
1979	12.37	14.18	5.98	5.53	3.06	-1.77	-4.56	-7.72	-9.65	-3.98	16.35
1980	14.03	7.66	7.37	3.27	-1.91	2.25	-2.88	-5.65	-10.00	-10.56	24.58
1981	-11.27	-13.66	-5.48	-2.29	-0.83	2.88	7.73	5.04	12.45	-2.00	-9.27
1982	-14.28	-3.48	-1.74	7.00	2.64	-1.07	0.83	2.09	3.44	10.96	-25.24
1983	-5.32	-4.12	-2.22	-0.47	-1.05	1.67	0.78	-1.78	1.86	-1.84	-3.48
1984	-0.09	2.45	-0.64	2.82	1.40	0.99	1.08	-2.64	-9.51	-18.85	18.76
1985	0.57	1.76	0.66	-0.56	1.17	1.00	1.02	-1.60	-6.44	-15.52	16.09
1986	5.02	10.63	2.45	1.37	3.90	2.16	0.81	0.26	-1.36	-5.03	10.05
1987	-3.11	-1.07	2.62	0.50	-0.78	4.02	1.91	2.79	4.55	-2.82	-0.29
1988	0.28	-1.66	-0.22	1.02	-1.93	-0.23	1.19	2.43	-2.58	-5.39	5.67
1989	2.64	4.43	3.48	3.68	-1.33	0.85	-0.92	3.10	-1.30	-5.29	7.93
1990	4.21	6.40	7.59	5.99	-0.78	3.24	0.50	-0.67	-3.40	-7.09	11.30
1991	3.26	-2.95	-4.67	-2.38	-1.38	-3.01	-1.41	-2.80	-3.28	-4.13	7.39
1992	3.25	-0.77	-2.07	-4.29	-2.36	-2.54	-1.53	-2.30	0.46	0.75	2.49
1993	2.28	-2.81	-3.27	-2.60	-1.52	-0.26	0.74	-0.07	3.25	6.86	-4.58
1994	1.54	0.02	4.10	-1.03	1.15	-0.27	-0.84	-1.22	-0.68	-1.09	2.63
1995	2.71	3.34	0.76	-0.06	-3.03	-1.92	-4.90	-4.81	-3.04	1.78	0.93
1996	3.35	0.52	0.84	-0.97	1.20	1.83	-1.17	-0.35	-1.32	-6.63	9.98
1997	4.20	-0.93	2.54	-1.58	-2.86	-4.56	-2.03	-1.23	3.54	0.72	3.48
1998	8.13	4.13	4.22	-0.57	6.13	4.41	-0.33	-0.98	-2.80	4.75	3.38
1999	-7.98	-6.32	-2.88	-0.16	-1.11	-0.56	-0.99	5.12	1.38	-3.29	-4.69
2000	8.76	2.70	7.54	6.39	3.40	3.12	7.40	3.74	-2.03	-11.95	20.71
2001	8.04	13.29	5.25	9.17	7.42	6.00	7.98	5.73	-3.98	-20.68	28.72
2002	4.46	4.90	1.58	5.80	3.00	1.58	-0.97	0.89	0.21	-5.77	10.22
2003	-0.01	0.18	-2.27	0.74	-3.02	-0.21	-1.35	-2.88	-1.54	8.54	-8.55
2004	0.32	9.61	2.45	2.66	3.70	1.69	-0.26	-3.91	-3.30	-14.24	14.56
2005	-2.45	7.19	-0.52	-2.83	0.79	-1.74	1.74	-0.87	3.22	-3.17	0.72
2006	4.68	3.09	4.81	0.05	0.35	-0.12	-2.02	-3.19	-4.79	-2.78	7.46
2007	2.33	5.40	5.33	1.07	-1.43	2.18	3.87	-2.65	-5.86	-7.97	10.30
2008	-0.77	0.57	0.49	2.59	-0.13	3.46	1.45	1.54	1.50	-9.32	8.55
2009	17.11	6.99	-2.49	-1.21	-3.87	-6.27	-6.09	-8.59	-12.61	3.35	13.76
Mean	2.09	2.20	0.99	1.19	0.11	0.55	-0.01	-0.39	-1.06	-3.58	5.68
Std Dev	7.05	5.64	3.87	3.21	2.64	2.55	3.37	3.54	4.77	7.09	11.68
Std Err	1.13	0.90	0.62	0.51	0.42	0.41	0.54	0.57	0.76	1.14	1.87
t-stat	1.80	2.38	1.56	2.26	0.26	1.32	-0.01	-0.67	-1.35	-3.08	2.96
IR	0.30	0.39	0.26	0.37	0.04	0.22	0.00	-0.11	-0.22	-0.51	0.49

Columbine Capital Services, Inc.

Average Annual Alpha Analysis

Model: Return on Equity Factor
Version: 2010
Universe: Columbine 1500
Issues: 1500
Test period: 1971-2009

Dividends included: Yes
Weighting: Equal
Costs: None
Currency: US

12-month holding period

Average Information Coefficient: 0.024

Year	Decile rank:										Decile Spread
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
1971	15.01	6.77	7.46	1.05	-1.65	-2.95	-3.92	-1.70	-0.69	-6.56	21.57
1972	-7.71	-0.09	1.37	1.77	-1.06	0.29	-4.41	-2.16	-0.24	1.86	-9.57
1973	-7.20	-4.22	-2.72	0.65	-1.13	1.27	0.39	4.14	6.91	3.92	-11.11
1974	-5.11	0.57	-0.49	2.95	3.81	4.19	7.13	5.27	4.39	1.14	-6.25
1975	-0.71	-4.74	-3.11	-0.38	-0.70	0.45	3.65	6.78	8.12	5.24	-5.95
1976	2.40	0.34	-4.31	-1.49	-2.25	0.28	0.46	0.69	1.37	2.03	0.37
1977	8.12	5.33	-0.73	-0.48	-1.32	-1.21	-2.17	-5.60	-2.68	-1.08	9.20
1978	6.75	7.80	1.75	3.15	2.15	-1.11	-3.72	-5.23	-4.18	-3.64	10.39
1979	19.56	16.17	6.67	3.60	4.17	-1.96	-5.97	-8.62	-11.75	-2.79	22.35
1980	3.87	0.74	2.47	1.78	-0.54	1.79	-1.82	-2.32	-5.21	-7.90	11.77
1981	-12.41	-12.47	-4.99	-0.05	2.53	1.39	6.33	6.74	10.33	2.09	-14.50
1982	-2.13	-3.75	-0.76	4.45	1.78	-1.87	-4.03	-3.02	1.28	9.88	-12.01
1983	-6.38	-4.65	-1.80	0.55	0.21	2.55	2.44	-0.01	-0.97	-5.59	-0.79
1984	1.24	1.34	-2.13	0.62	0.87	-0.29	0.24	-4.00	-9.06	-15.90	17.14
1985	1.36	2.44	0.13	-1.90	2.11	4.16	2.09	-2.82	-5.76	-16.18	17.54
1986	3.20	7.27	0.99	1.75	2.31	0.63	0.26	-0.55	4.76	2.95	0.25
1987	-3.52	-2.04	0.37	-0.72	-0.23	3.52	3.06	2.97	1.40	-3.95	0.43
1988	1.62	0.13	1.46	1.72	-2.52	-3.46	-0.82	0.34	-6.10	-4.32	5.94
1989	0.78	4.64	4.40	4.50	0.18	1.62	0.50	3.49	-0.99	-4.63	5.41
1990	2.78	3.27	5.32	3.66	-1.62	0.46	-2.72	-2.19	-5.33	-4.71	7.48
1991	3.33	-2.28	-3.62	-3.44	-3.88	-2.15	-0.49	-2.24	-3.25	-8.46	11.79
1992	2.87	-2.77	-3.91	-6.23	-3.20	-3.51	0.51	-1.69	1.40	9.03	-6.16
1993	0.16	-2.01	-2.20	0.01	-2.08	0.74	-1.50	-1.74	4.24	6.12	-5.96
1994	2.94	1.28	4.59	-0.71	1.11	-3.09	-2.30	-3.21	-1.31	0.32	2.63
1995	4.45	1.09	1.00	1.36	-4.13	-3.29	-2.10	-4.84	-3.05	2.61	1.84
1996	2.74	0.63	-0.79	-0.50	0.35	-0.22	-1.12	0.63	-1.52	-4.20	6.93
1997	2.60	-1.05	1.62	-3.58	-2.72	-1.22	-2.63	-2.02	1.09	3.30	-0.70
1998	5.05	1.52	1.63	-2.21	2.07	4.71	-1.91	-0.56	-2.31	8.82	-3.77
1999	-10.20	-6.22	-8.25	0.99	-3.24	-2.64	0.33	1.98	-0.69	-1.94	-8.26
2000	6.43	1.66	4.01	6.39	2.87	0.02	2.52	3.03	-1.65	-6.26	12.69
2001	5.75	9.70	1.51	4.16	4.05	2.53	2.39	1.05	-6.47	-14.06	19.81
2002	6.81	-0.16	-2.87	0.21	-2.08	-1.88	-1.90	-0.12	1.52	10.05	-3.24
2003	-1.11	4.39	0.40	0.03	-1.43	-0.73	-1.33	-2.72	-1.23	1.79	-2.90
2004	-0.18	8.36	2.21	0.78	2.74	0.98	-0.57	-3.62	-3.03	-9.26	9.08
2005	-0.81	6.19	0.35	-1.83	0.77	-1.16	1.77	-1.78	-0.04	-2.01	1.20
2006	5.11	2.87	3.63	-0.33	-1.60	0.41	-1.49	-2.54	-4.23	-2.50	7.61
2007	2.98	4.79	2.53	1.50	-0.87	2.25	2.59	-2.41	-5.48	-6.61	9.58
2008	0.40	-0.26	-1.37	0.63	0.26	1.32	1.81	0.13	1.49	-5.36	5.77
2009	10.94	9.35	2.20	12.61	-3.12	2.35	-6.09	-8.60	-16.33	-13.26	24.20
Mean	1.64	1.35	0.10	0.48	-0.24	-0.07	-0.39	-1.00	-1.22	-1.81	3.44
Std Dev	6.16	5.19	3.37	2.51	2.30	2.24	2.85	3.40	4.57	6.67	9.75
Std Err	0.99	0.83	0.54	0.40	0.37	0.36	0.46	0.54	0.73	1.07	1.56
t-stat	1.62	1.58	0.18	1.15	-0.64	-0.20	-0.83	-1.79	-1.63	-1.65	2.15
IR	0.27	0.26	0.03	0.19	-0.11	-0.03	-0.14	-0.29	-0.27	-0.27	0.35

Columbine Capital Services, Inc.

Average Annual Alpha Analysis

Model: Return on Equity Factor
Version: 2010
Universe: Columbine 1500
Issues: 1500
Test period: 1971-2009

Dividends included: Yes
Weighting: Equal
Costs: None
Currency: US

24-month holding period--annualized

Average Information Coefficient: 0.010

Year	Decile rank:										Decile Spread
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
1971	2.69	3.53	3.19	2.82	1.40	-1.21	-2.88	-4.75	-2.16	-1.95	4.64
1972	-6.36	-2.67	-1.59	0.76	-0.30	0.59	-1.38	0.19	3.06	4.38	-10.74
1973	-5.34	-2.69	-1.00	2.51	-0.40	0.72	1.15	6.11	5.78	3.51	-8.85
1974	-4.84	-1.60	-1.84	1.61	3.15	4.13	4.78	6.27	4.79	4.38	-9.21
1975	1.78	-2.97	-4.36	-1.51	-1.58	0.54	2.11	3.54	5.52	6.09	-4.30
1976	2.40	0.64	-1.07	-0.61	-2.80	-1.87	-1.08	-0.53	-1.46	4.56	-2.16
1977	8.49	7.91	-0.11	-0.46	-2.05	-2.07	-3.86	-4.81	-3.04	0.17	8.32
1978	18.31	12.65	4.00	0.72	0.54	-3.00	-7.17	-8.96	-7.87	-0.61	18.93
1979	16.75	9.98	0.75	2.73	1.80	-1.90	-5.53	-6.76	-9.38	-2.02	18.77
1980	-5.15	-8.26	-2.95	-0.89	-0.90	2.18	1.76	3.36	3.67	1.24	-6.39
1981	-4.32	-10.29	-4.69	0.28	3.17	0.81	3.23	3.74	5.62	3.84	-8.16
1982	-4.87	-5.22	-1.34	2.55	1.13	-0.14	-0.57	-1.54	0.40	1.56	-6.43
1983	-3.80	-3.77	-1.48	0.57	-0.56	1.12	1.55	-1.22	-3.53	-9.87	6.07
1984	3.15	1.93	-0.76	-0.21	-0.53	0.91	-0.76	-4.24	-8.43	-17.48	20.63
1985	1.53	5.49	3.18	1.92	2.28	3.59	2.49	-2.59	-3.11	-9.70	11.23
1986	-1.17	3.57	0.98	0.51	1.10	1.75	0.89	1.06	2.49	0.45	-1.63
1987	-0.89	0.35	0.03	-1.43	-0.79	0.88	1.08	1.20	0.63	-1.74	0.86
1988	0.77	1.66	2.88	1.55	-1.56	-2.61	-1.63	-0.88	-2.01	-3.66	4.44
1989	-0.95	4.36	5.08	5.00	0.50	0.63	-0.29	2.09	-4.38	-4.70	3.75
1990	1.64	1.68	2.22	2.14	-1.90	-2.81	-2.79	-3.00	-5.17	-6.33	7.97
1991	2.19	-2.92	-4.69	-4.44	-4.73	-1.16	-0.49	-1.25	-1.41	-4.88	7.06
1992	-0.34	-2.34	-3.36	-3.28	-3.38	-3.02	1.67	0.44	4.03	10.66	-11.00
1993	-0.12	-0.63	0.98	1.62	-1.95	-1.09	-1.99	-3.67	2.10	6.16	-6.28
1994	2.75	1.92	4.38	-1.52	-0.54	-4.37	-0.94	-2.41	-3.62	-1.39	4.14
1995	1.66	2.15	-1.04	2.16	-5.61	-2.44	-3.81	-7.19	-6.24	1.54	0.12
1996	0.46	-2.78	-1.44	-2.51	-0.59	-0.78	-4.90	2.54	1.68	1.34	-0.87
1997	0.55	-0.48	-0.65	-1.64	-0.79	-0.90	-2.49	-0.37	-0.45	5.19	-4.64
1998	-4.74	-6.79	0.13	-6.45	-4.43	1.84	-2.03	-0.98	-3.67	16.04	-20.78
1999	-4.16	-4.95	-4.03	1.50	0.39	2.37	2.25	-0.91	-0.60	2.68	-6.85
2000	2.25	0.92	0.65	1.49	2.20	0.39	0.96	3.19	0.00	-1.62	3.87
2001	1.88	3.82	-1.92	1.70	1.48	1.72	0.90	1.97	0.35	-3.16	5.03
2002	2.41	-2.57	-2.75	-0.20	-2.70	-1.76	-2.72	0.46	0.29	10.49	-8.07
2003	-1.11	5.17	1.34	2.08	0.54	-0.08	-1.94	-3.04	-3.26	-0.43	-0.67
2004	-1.49	6.78	1.12	-1.04	1.51	0.86	-0.47	-1.90	-3.14	-2.75	1.26
2005	2.17	3.92	1.55	0.06	-0.57	-1.26	0.30	-3.25	-1.38	-1.36	3.53
2006	3.68	3.61	2.13	-0.92	2.08	1.50	-0.80	-2.60	-4.63	-5.69	9.36
2007	0.83	-0.11	0.15	0.23	0.52	0.90	1.29	-0.11	-0.87	-2.48	3.31
2008	2.83	-0.54	-1.88	1.32	2.00	1.35	-0.14	-0.78	-0.01	-3.65	6.48
2009	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Mean	1.08	0.64	-0.30	0.16	-0.43	-0.18	-0.77	-0.94	-1.20	0.00	1.08
Std Dev	5.26	4.96	2.58	2.24	2.15	1.97	2.56	3.51	3.97	6.21	9.04
Std Err	0.85	0.80	0.42	0.36	0.35	0.32	0.42	0.57	0.64	1.01	1.47
t-stat	1.23	0.77	-0.69	0.44	-1.21	-0.54	-1.80	-1.61	-1.81	0.00	0.72
IR	0.21	0.13	-0.11	0.07	-0.20	-0.09	-0.30	-0.27	-0.30	0.00	0.12

Columbine Capital Services, Inc.

Average Annual Alpha Analysis

Model: Return on Equity Factor
Version: 2010
Universe: Columbine 1500
Issues: 1500
Test period: 1971-2009

Dividends included: Yes
Weighting: Equal
Costs: None
Currency: US

36-month holding period--annualized

Average Information Coefficient: -0.004

Year	Decile rank:										Decile Spread
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
1971	0.12	-1.04	-0.80	-0.25	-0.12	0.67	-1.65	-2.18	0.34	3.63	-3.52
1972	-5.62	-1.61	-1.67	0.97	0.43	1.06	0.38	1.62	2.61	4.66	-10.28
1973	-4.73	-4.44	-2.35	1.83	-0.25	0.96	3.29	6.17	6.61	4.13	-8.86
1974	-3.74	-2.40	-4.44	0.83	1.72	3.24	3.99	5.37	5.08	6.97	-10.71
1975	1.34	-1.84	-3.23	-1.27	-2.30	0.74	1.53	1.20	2.86	7.29	-5.95
1976	6.39	2.29	-0.31	0.36	-1.97	-2.63	-2.87	-3.72	-1.03	4.57	1.82
1977	19.24	12.79	0.66	0.11	-2.65	-5.29	-7.43	-8.29	-4.47	3.14	16.11
1978	18.95	9.56	4.76	1.00	-0.78	-5.63	-6.21	-8.05	-8.11	-3.99	22.94
1979	5.55	1.14	-2.66	-0.32	1.43	-0.81	-1.20	-0.24	-2.89	0.86	4.69
1980	0.65	-6.58	-2.63	-0.72	-1.15	2.53	1.16	0.43	1.35	3.46	-2.81
1981	-6.92	-8.85	-3.09	-0.73	2.56	0.53	2.53	2.54	3.23	1.74	-8.65
1982	-5.95	-8.38	-3.15	2.35	1.06	0.22	-0.81	-0.58	-0.89	-2.62	-3.34
1983	-4.48	-3.13	-1.81	-0.52	-0.48	1.97	0.82	-1.54	-4.56	-11.88	7.40
1984	1.98	2.17	3.09	2.03	0.57	0.70	-0.91	-0.96	-5.85	-14.35	16.33
1985	-2.03	3.43	2.45	1.32	2.59	3.09	1.75	-1.37	-0.64	-6.71	4.68
1986	-0.24	4.80	1.76	-0.43	0.26	0.01	-0.13	-0.30	1.86	0.79	-1.03
1987	-0.17	0.49	1.19	-1.25	-0.39	1.10	0.95	0.76	1.14	-0.35	0.18
1988	0.19	2.91	3.34	3.99	0.30	-1.06	-2.72	-2.01	-2.20	-1.75	1.94
1989	-0.52	2.96	3.66	3.40	-0.98	-0.86	-1.80	0.47	-5.06	-1.94	1.42
1990	1.19	-1.57	-0.66	-0.37	-1.10	-3.44	-2.72	-1.54	0.09	-3.19	4.38
1991	0.34	-2.81	-3.25	-2.41	-3.33	0.47	0.25	-1.90	0.01	-1.45	1.79
1992	-2.08	-0.39	-2.03	-0.65	-3.32	-3.12	-1.76	-1.36	1.62	9.16	-11.23
1993	3.52	-1.64	0.72	1.42	-3.10	-2.81	-2.57	-4.98	2.45	3.33	0.19
1994	2.01	1.76	1.55	-2.13	-1.94	-4.82	-2.93	-3.34	-2.54	0.67	1.34
1995	-1.65	3.06	-3.34	2.84	-8.16	-3.36	-4.31	-7.63	-6.88	1.43	-3.08
1996	-2.32	-3.14	0.57	2.76	2.13	0.14	-4.45	-2.50	0.78	3.45	-5.77
1997	-4.73	-0.36	0.05	-0.30	3.70	-1.94	-1.56	-2.79	-4.39	9.60	-14.33
1998	-2.95	-3.83	-2.60	-2.28	-0.08	2.32	-1.71	0.01	-2.75	7.54	-10.49
1999	-4.83	-2.92	-1.32	0.69	-1.30	2.60	1.60	0.68	1.23	3.12	-7.96
2000	1.45	-0.44	-0.39	-0.04	1.03	-0.11	0.23	3.75	1.26	1.23	0.21
2001	1.55	3.19	-1.36	0.06	0.34	1.05	0.58	0.19	-0.01	-2.59	4.14
2002	1.06	-0.89	-1.15	1.03	-1.01	-1.17	-2.34	-2.15	-0.45	9.03	-7.96
2003	-3.04	2.59	1.40	1.77	2.82	0.89	-1.58	-1.18	-3.05	-0.64	-2.40
2004	1.11	5.99	1.62	-1.28	0.13	-0.18	-0.77	-3.11	-4.18	0.53	0.58
2005	1.91	4.97	0.70	1.04	-0.34	-1.14	1.61	-2.65	-1.85	-5.21	7.12
2006	0.64	1.14	1.20	-0.92	1.04	1.59	-0.16	-1.12	-1.92	-2.54	3.18
2007	2.47	1.03	1.46	-0.21	-1.37	2.12	-0.90	0.54	-3.23	-1.76	4.23
2008	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
2009	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Mean	0.87	0.42	-0.34	0.40	-0.26	-0.35	-0.89	-1.16	-0.83	0.88	-0.01
Std Dev	5.64	4.50	2.33	1.58	2.22	2.32	2.51	3.19	3.35	5.39	8.22
Std Err	0.93	0.74	0.38	0.26	0.37	0.38	0.41	0.52	0.55	0.89	1.35
t-stat	0.91	0.55	-0.88	1.51	-0.70	-0.88	-2.09	-2.16	-1.47	0.96	0.00
IR	0.15	0.09	-0.15	0.25	-0.12	-0.15	-0.35	-0.36	-0.25	0.16	0.00

2010 ROE Factor, Sector-Specific Results Analysis

1st and 10th deciles of the Columbine 1500 Universe: 1971-2009

Equal-weighted deciles, gross of transactions costs

AVERAGE ACTIVE RETURN (ANNUALIZED)

GICS Code	Sector Name	1-Month Hold		3-Month Hold		6-Month Hold		12-Month Hold		24-Month Hold		36-Month Hold	
		1st	10th	1st	10th	1st	10th	1st	10th	1st	10th	1st	10th
10	Energy	0.72%	-6.24%	1.43%	-5.21%	1.05%	-4.40%	1.13%	-3.16%	2.79%	-2.95%	1.94%	-2.48%
15	Materials	2.03%	-5.97%	2.08%	-4.82%	1.43%	-3.15%	0.15%	-1.87%	-0.02%	-1.10%	-1.52%	-1.16%
20	Industrials	0.75%	-3.69%	1.78%	-3.51%	1.36%	-2.60%	0.69%	-1.05%	0.08%	0.71%	-0.90%	2.05%
25	Consumer Discretionary	2.04%	-6.93%	1.91%	-5.19%	2.18%	-4.12%	2.68%	-2.20%	1.82%	-1.07%	1.98%	0.32%
30	Consumer Staples	-2.21%	-0.75%	-0.75%	0.20%	-0.20%	1.32%	0.37%	1.29%	0.89%	1.33%	1.60%	1.54%
35	Health Care	1.05%	-0.02%	1.91%	-0.91%	2.76%	-1.81%	1.24%	-0.89%	0.53%	3.19%	2.33%	3.29%
40	Financials	0.04%	-7.21%	-0.08%	-5.72%	0.57%	-4.39%	0.08%	-2.07%	1.58%	-1.94%	2.00%	-2.69%
45	Information Technology	2.76%	-2.64%	4.08%	-3.81%	4.19%	-3.69%	4.29%	0.61%	1.23%	2.34%	1.17%	-1.44%
50	Telecommunication Services	2.58%	-3.52%	3.43%	-4.27%	2.16%	-0.51%	0.71%	5.12%	-2.99%	8.28%	-3.08%	12.04%
55	Utilities	3.16%	-2.19%	3.11%	-2.12%	2.80%	-1.29%	3.13%	-0.74%	4.20%	-0.83%	5.48%	-1.02%

STANDARD DEVIATION OF ANNUAL ACTIVE RETURNS

GICS Code	Sector Name	1-Month Hold		3-Month Hold		6-Month Hold		12-Month Hold		24-Month Hold		36-Month Hold	
		1st	10th	1st	10th	1st	10th	1st	10th	1st	10th	1st	10th
10	Energy	12.07%	12.88%	12.10%	10.98%	11.05%	9.38%	10.71%	9.57%	10.90%	9.66%	9.53%	9.43%
15	Materials	13.62%	15.35%	12.58%	12.62%	14.21%	11.68%	15.36%	11.48%	9.66%	9.89%	7.08%	8.30%
20	Industrials	7.54%	15.26%	8.86%	12.73%	8.41%	12.04%	6.81%	9.45%	6.06%	10.03%	4.92%	9.85%
25	Consumer Discretionary	10.11%	10.40%	9.25%	10.31%	9.31%	9.82%	9.54%	8.87%	7.46%	7.01%	6.65%	7.26%
30	Consumer Staples	10.02%	13.93%	8.58%	13.78%	9.11%	10.96%	10.16%	9.51%	8.96%	10.14%	9.39%	10.11%
35	Health Care	15.36%	18.22%	16.53%	17.72%	16.71%	18.54%	15.77%	22.41%	13.83%	26.56%	15.40%	20.76%
40	Financials	14.45%	18.04%	12.59%	15.92%	12.17%	16.08%	10.01%	13.50%	9.80%	10.53%	12.48%	10.78%
45	Information Technology	21.53%	24.72%	21.44%	25.75%	25.07%	20.56%	24.53%	23.03%	17.90%	23.18%	19.49%	12.12%
50	Telecommunication Services	13.81%	25.72%	13.96%	24.51%	14.38%	27.16%	13.62%	27.38%	9.97%	26.58%	11.91%	36.32%
55	Utilities	11.58%	11.86%	10.86%	8.65%	11.46%	7.49%	10.01%	6.08%	9.46%	4.83%	9.30%	3.91%

AVERAGE MONTHLY INFORMATION COEFFICIENTS

GICS Code	Sector Name	HOLDING PERIOD					
		1-Month	3-Month	6-Month	12-Month	24-Month	36-Month
10	Energy	0.016	0.024	0.026	0.029	0.020	0.007
15	Materials	0.027	0.040	0.044	0.033	0.020	0.001
20	Industrials	0.016	0.020	0.018	0.012	-0.004	-0.026
25	Consumer Discretionary	0.023	0.030	0.032	0.032	0.017	0.009
30	Consumer Staples	0.014	0.017	0.024	0.033	0.017	-0.004
35	Health Care	0.021	0.028	0.042	0.052	0.041	0.013
40	Financials	0.031	0.043	0.050	0.047	0.036	0.045
45	Information Technology	0.029	0.042	0.057	0.056	0.039	0.031
50	Telecommunication Services	0.021	0.028	0.031	0.036	0.043	0.048
55	Utilities	0.021	0.029	0.031	0.038	0.065	0.076

Source: savgroe.txt; 20-Apr-2010



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