

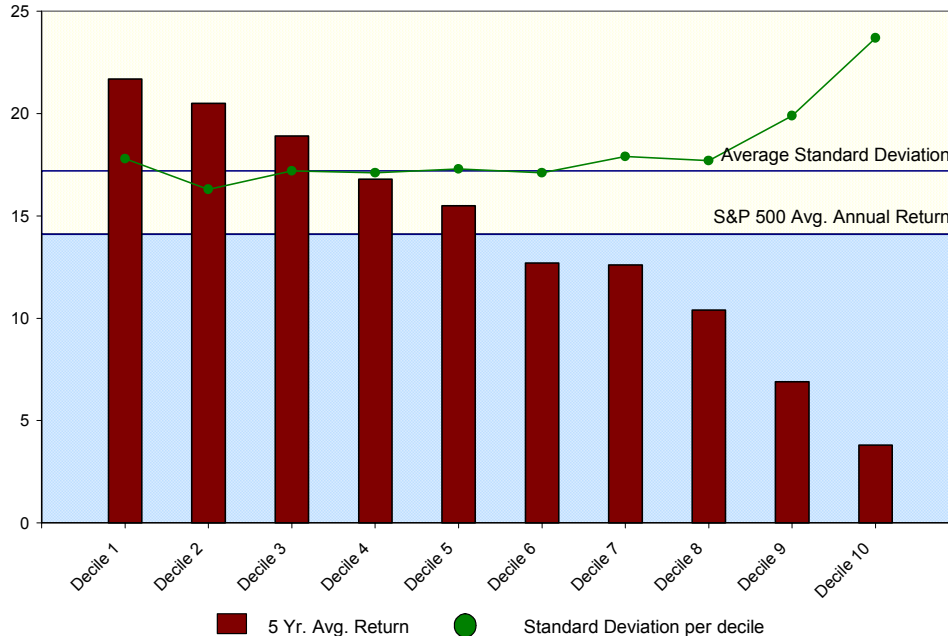


Employing the Value Momentum Model (VMO) in a Long-Short Strategy July 30, 2004

Introduction

The typical evaluation of stock selection models that have been developed by Ford examines the historical returns of the top-ranked stocks according to the model in question versus the universe average. This is usually presented as a decile distribution like the one shown below. The interpretation is fairly straightforward. The average return of the top decile versus the universe average represents the expected excess return of a portfolio holding the top 10% of stocks based on the model. The distribution shown below indicates that rates of return decline steadily with lower VMO rankings. While we have an expected positive excess return by buying the top decile stocks, it is interesting to examine whether some value can be captured from the VMO's prediction of below average performance for the bottom decile. The bottom decile has a negative excess return versus the universe average but the average absolute returns are still positive. This study examines the potential to use the VMO model to improve risk adjusted returns by selling short the stocks with the lowest VMO scores.

VMO Decile Returns (%) on S&P 500 12/83 to 12/03



The Value/Momentum model was created in 1998 and introduced in its present form in 1999. Performance is based on decile rankings of the S&P 500 universe of stocks, equally weighted, and rebalanced monthly. The results quoted here are the results of backtesting and should be qualified in several respects: 1) results are not necessarily indicative of the returns that individual investors could have obtained, since the portfolios are large and transaction costs excluded; 2) no analysis technique is effective for every security to which it is applied, even though it may be effective on the average; and 3) there is no assurance that future results will duplicate past results.

Isolating the VMO factor impact

While the VMO has an impressive record of performance, the model also tends to heavily weight certain industries when applied across a broad universe. The resulting overweighting can lead to serious consequences if the unintended industry bet proves wrong. Equal weighting or market index weighting the portfolio can eliminate this risk. In a long-short portfolio that pairs longs and shorts in the same industry, industry risk is also neutralized. The table below shows the highest annual percentage weighting by Ford's 15 macro industry groups of a twenty-stock VMO portfolio taken from the largest stocks from 1983 to 2003. Using the model over this time period resulted in periods with large overweights in some industries. The financial services and technology groups were particularly favored by the model during this time.

Highest Industry Exposure 12/83 - 12/03

Automotive	2.8%
Consumer Goods	12.1%
Food & Beverage	4.5%
Retail Stores	6.7%
Metals & Mining	2.6%
Manufacturing	5.4%
Oil & Gas	5.4%
Primary Process	7.5%
Machinery	4.5%
Technology	22.7%
Construction	5.6%
Financial	18.1%
Services	13.4%
Transportation	3.7%
Utility	14.8%

Despite its tendency to overweight some industry groups, VMO works well when applied within each of them. The following table shows the quintile returns based on VMO for each of Ford's 15 macro industry groups of S&P 500 stocks. In each of the 15 industry groups, the highest VMO quintile returns exceeded the average returns of the industry group. Likewise, the lowest VMO quintiles for each group had returns that were lower than their respective industry average. In order to take advantage of the consistency of the VMO model across industry groups and to neutralize the industry overweighting effect that the model has when implemented across sectors, we can create a portfolio that is equally balanced among industry groups and is market neutral (in dollar terms) within those groups

Average Annual Total Returns (%)
1283 - 12/03

	Highest VMO	Q-2	Q-3	Q-4	Lowest VMO	Group
Automotive	22.3	14.3	13.9	2.7	-2.5	11.8
Consumer Goods	23.2	23.0	16.1	10.8	6.5	16.3
Food & Beverage	18.8	20.0	17.9	19.2	11.8	18.3
Retail Stores	20.8	13.4	15.9	10.4	5.3	13.9
Metals & Mining	16.6	4.0	12.5	4.9	-10.3	8.7
Manufacturing	17.8	22.5	16.4	8.6	5.4	14.9
Oil & Gas	13.8	14.5	11.2	7.3	-2.3	9.9
Primary Process	18.2	12.9	8.2	9.0	5.1	11.4
Machinery	14.8	13.8	2.8	8.9	0.9	9.6
Technology	23.9	15.1	16.3	5.2	2.2	13.0
Construction	21.8	13.9	15.2	9.2	-4.9	12.3
Financial	22.1	19.6	13.4	12.3	9.1	15.6
Services	22.3	15.8	13.3	8.8	7.7	14.1
Transportation	18.0	14.7	9.3	-5.2	-6.0	8.8
Utility	18.5	10.9	12.6	13.3	5.8	12.7

Long-Short Portfolio Construction

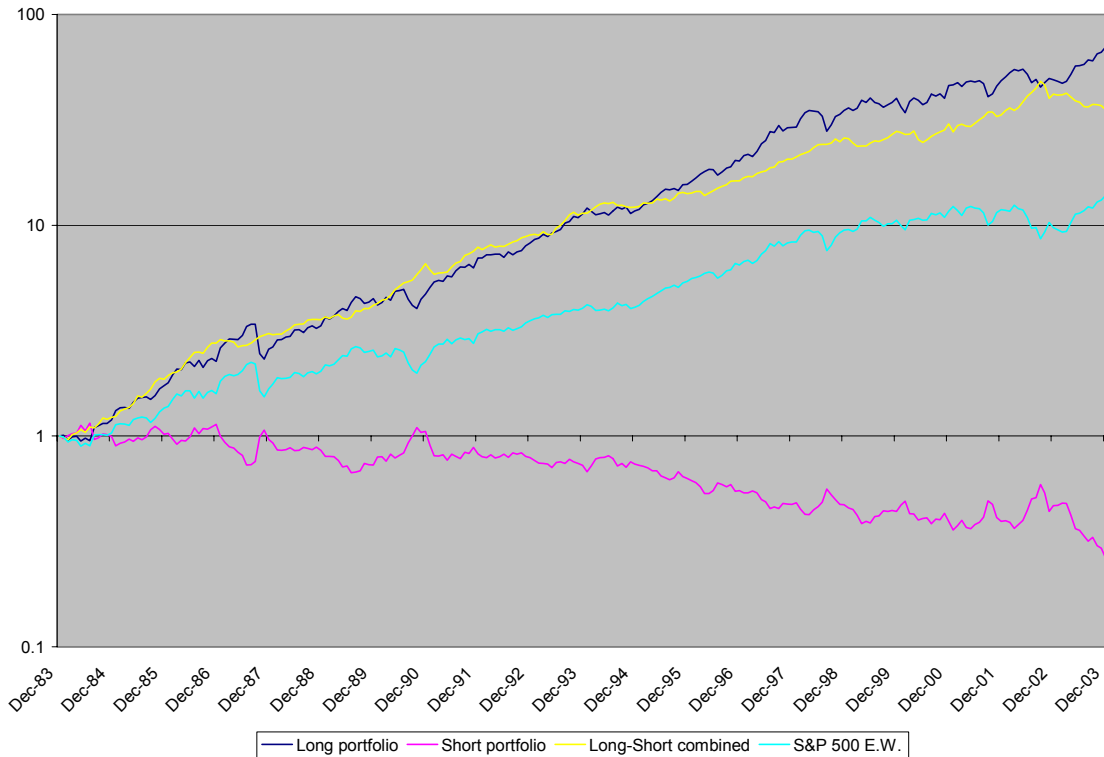
The construction of the portfolio involved ranking each of the 15 industry groups by VMO. Based on these rankings, the top two stocks from each sector were selected for the long portion of the portfolio. Similarly, the bottom two stocks from each industry group were selected to short. This resulted in 30 long and 30 short positions, equally-balanced across industry groups. The test portfolios were rebalanced on a monthly basis.

Performance

Performance was computed for both the long and short portfolios separately and were combined assuming equal-sized long and short positions rebalanced monthly. The results, which are intended as a simple illustration, lack any adjustment for the impact of turnover or interest income on the short positions. It is not surprising that the long portfolio posted very good returns over the 20-year period shown. The short portfolio returns were a disappointing 6.5% average annual loss. However, the combined long-short portfolio produced some interesting results. The short portion reduced the performance as compared to the long only portfolio. However, combining the two portfolios generated a standard deviation of the returns that produced a higher Sharpe ratio than either the long only portfolio or the S&P 500 index. The higher Sharpe ratio, which measures return per unit of risk, indicates that the long-short portfolio produces superior risk adjusted returns.

Although the overall historical results for a long-short strategy appear promising, recent history gives one pause. The year 2003 was a particularly difficult one for quantitative strategies. Many of the selection models we track (including VMO) had perverse return distributions for the year. With the worst ranked VMO stocks showing the better performance for 2003, shorting stocks in this group produced very poor results and consequently hurt the long-short strategy performance.

Cumulative Return Index 12/83 to 12/03



Performance Summary

	<u>Long</u>	<u>Short</u>	<u>Combined</u>	<u>S&P 500</u>
Annual Return (%)	23.7	-6.5	19.5	14.1
Std. Dev.	18.1	20.8	11.2	17.2
Sharpe Ratio	1.02	NM	1.28	0.52

Conclusion

This preliminary examination shows that there may be some interesting potential in using the Ford Value Momentum model in a combined long-short strategy. The information value captured by shorting the lowest ranked VMO stocks provides a risk adjusted return improvement when matched with a similar long position based on VMO. While the simple design of this test and the frequent rebalancing resulted in high turnover, the performance results give a general indication of the benefits of the strategy. That stated, recent performance of this strategy demonstrates the difficulty in counting on historical results to produce an expected future outcome.