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Fiduciary and Economic Scoring of Mutual Funds Enhances Portfolios

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Summary

Using data from December 31, 2000 through March 31, 2013, the fi360 Fiduciary Scores for mutual funds were evaluated by MacroRisk Analytics to assess the scores' efficacy as a screening criterion. We found that the scores are stable over time, have statistically significant content, and are useful as part of a mutual fund portfolio construction process. We also determined that, with the addition of the MacroRisk "Five-Risks" screening, portfolios could have enhanced performance and volatility could be further reduced.

Introduction

The MacroRisk Analytics (MRA) scientific staff was recently asked to analyze the fi360 mutual fund fiduciary scores to ascertain their stability and whether or not there was predictive power for financial planners, wealth managers, and investors. After a data intensive analysis, we determined that the fi360 score does have significant stability and value to portfolio managers. We also determined that the MacroRisk "Five-Risks" screening adds additional value by reducing additional sources of portfolio volatility. (The "Five-Risks" approach has been discussed previously in articles such as Chong, J. T., Jennings, W. P., and Phillips, G. M. (2014). Monitoring the five risks: Analytical risk measurement for retail investors and wealth managers. *Investments & Wealth Monitor*, March/April, 17–19 and 24 and Chong, J., Jennings, W. P., and Phillips, G. M. (2012). Five types of risk and a fistful of dollars: Practical risk analysis for investors. *Journal of Financial Service Professionals*, 66(3), 68–76.)

In May 2013, MRA was provided a copy of the historical fi360 score database which was then merged with performance data generated from www.MacroRisk.com. For each period beginning with December 2000, MRA received the current fi360 score, the one-year average score, the three-year average score, the five-year average score, and the 10-year average score for almost 22,000 funds, a total of approximately a million



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observations. These periods were on a quarterly basis until December 2010. From January 2011 through the ending date of this study, March 2013, the period frequency was monthly. For each of these fund-date combinations, we merged the one-year, three-year, and five-year future annualized returns, standard deviation of returns, and lower semideviation of returns observed for each fund. By integrating these forward data (“future outcomes”) with the spot and average fiduciary scores (the “predicting data”), the resulting database facilitated powerful forward-looking testing of returns and empirical risk over one-, three-, and five-year future time horizons.

After analyzing the observed relationship between various fi360 Fiduciary Scores as predictors of future outcomes data, MRA confirms that the top group of the fi360 Fiduciary Score Average (1 year), those in the top quartile identified as the “Green” category, consistently provides better results than the other averages and categories in several dimensions. The top quartile of the one-year average Fiduciary Score (“Green”) demonstrated higher median returns when looking at one-year, three-year, and five-year future annualized returns, as well as higher median annualized return to standard deviation (and lower semideviation) ratio over the same one-, three-, five-year forecasting horizons.

The fi360 Fiduciary Score

The fi360 Fiduciary Score is an investment rating system used to evaluate open-ended mutual funds, exchange-traded funds (ETFs), and group retirement annuities on nine different criteria, which include:

- 1) Regulatory oversight
- 2) Track record
- 3) Assets in the investment
- 4) Stability of the organization
- 5) Composition consistent with asset class
- 6) Style consistency
- 7) Expense ratio/fees relative to peers
- 8) Risk-adjusted performance relative to peers
- 9) Performance relative to peers

The score, itself, ranges from 0 to 100, with zero being the most preferable, and is calculated on a monthly basis for investments possessing at least three years of trading history.

There are five different fi360 Fiduciary Scores:

- First, there is the fi360 Fiduciary Score by its lonesome which is calculated monthly for appropriate investments using the nine criteria mentioned earlier.
- Second, the fi360 Fiduciary Score Average (1 year) is the rolling 12-month average of the fi360 Fiduciary Score.
- Third, the fi360 Fiduciary Score Average (3 year) is the rolling 36-month average of the fi360 Fiduciary Score.
- Fourth, the fi360 Fiduciary Score Average (5 year) is the rolling 60-month average of the fi360 Fiduciary Score.
- Fifth, the fi360 Fiduciary Score Average (10 year) is the rolling 120-month average of the fi360 Fiduciary Score.

For example, it is important to note that an investment with only three years of trading history would require another year of trading history in order to compute the fi360 Fiduciary Score Average (1 year). The same logic applies for other periods.

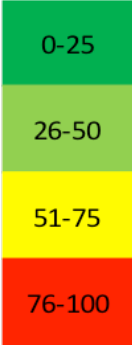
fi360 Fiduciary Scores Evaluated

MacroRisk Analytics (MRA) evaluated 16 different fi360 Fiduciary Scores, over one-year, three-year, and five-year future horizons, across measures such as annualized returns, standard deviation, lower semideviation,

and return/risk ratio. To make it easier to interpret the fi360 scores, colors will be assigned to each quartile. The colored chart is a modified bar chart presented in the fi360 Fiduciary Score Methodology. For example, the fi360 Fiduciary Score Average (1 year) of 20 will be referred to as FI1YR_GREEN. We present the notation for all 16 fi360 Fiduciary Scores below.

fi360 Fiduciary Score

- 1) FI_SCORE_GREEN: fi360 Fiduciary Score between 0-25
- 2) FI_SCORE_LTGREEN: fi360 Fiduciary Score between 26-50
- 3) FI_SCORE_YELLOW: fi360 Fiduciary Score between 51-75
- 4) FI_SCORE_RED: fi360 Fiduciary Score between 76-100



fi360 Fiduciary Score Average (1 year)

- 5) FI1YR_GREEN: fi360 Fiduciary Score Average (1 year) between 0-25
- 6) FI1YR_LTGREEN: fi360 Fiduciary Score Average (1 year) between 26-50
- 7) FI1YR_YELLOW: fi360 Fiduciary Score Average (1 year) between 51-75
- 8) FI1YR_RED: fi360 Fiduciary Score Average (1 year) between 76-100

fi360 Fiduciary Score Average (3 year)

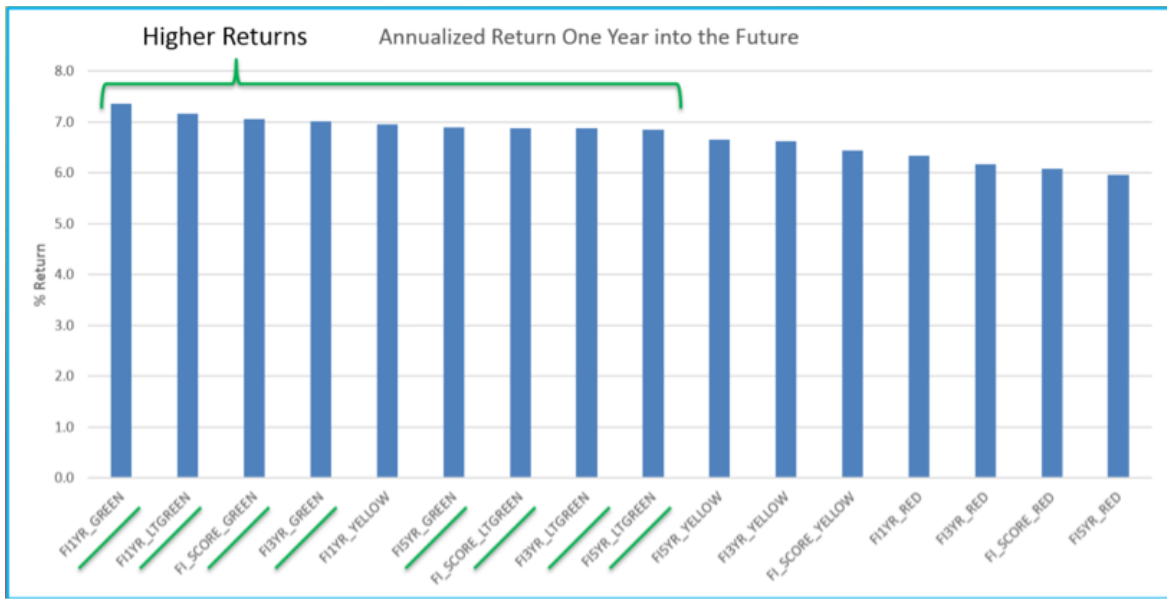
- 9) FI3YR_GREEN: fi360 Fiduciary Score Average (3 year) between 0-25
- 10) FI3YR_LTGREEN: fi360 Fiduciary Score Average (3 year) between 26-50
- 11) FI3YR_YELLOW: fi360 Fiduciary Score Average (3 year) between 51-75
- 12) FI3YR_RED: fi360 Fiduciary Score Average (3 year) between 76-100

fi360 Fiduciary Score Average (5 year)

- 13) FI5YR_GREEN: fi360 Fiduciary Score Average (5 year) between 0-25
- 14) FI5YR_LTGREEN: fi360 Fiduciary Score Average (5 year) between 26-50
- 15) FI5YR_YELLOW: fi360 Fiduciary Score Average (5 year) between 51-75
- 16) FI5YR_RED: fi360 Fiduciary Score Average (5 year) between 76-100

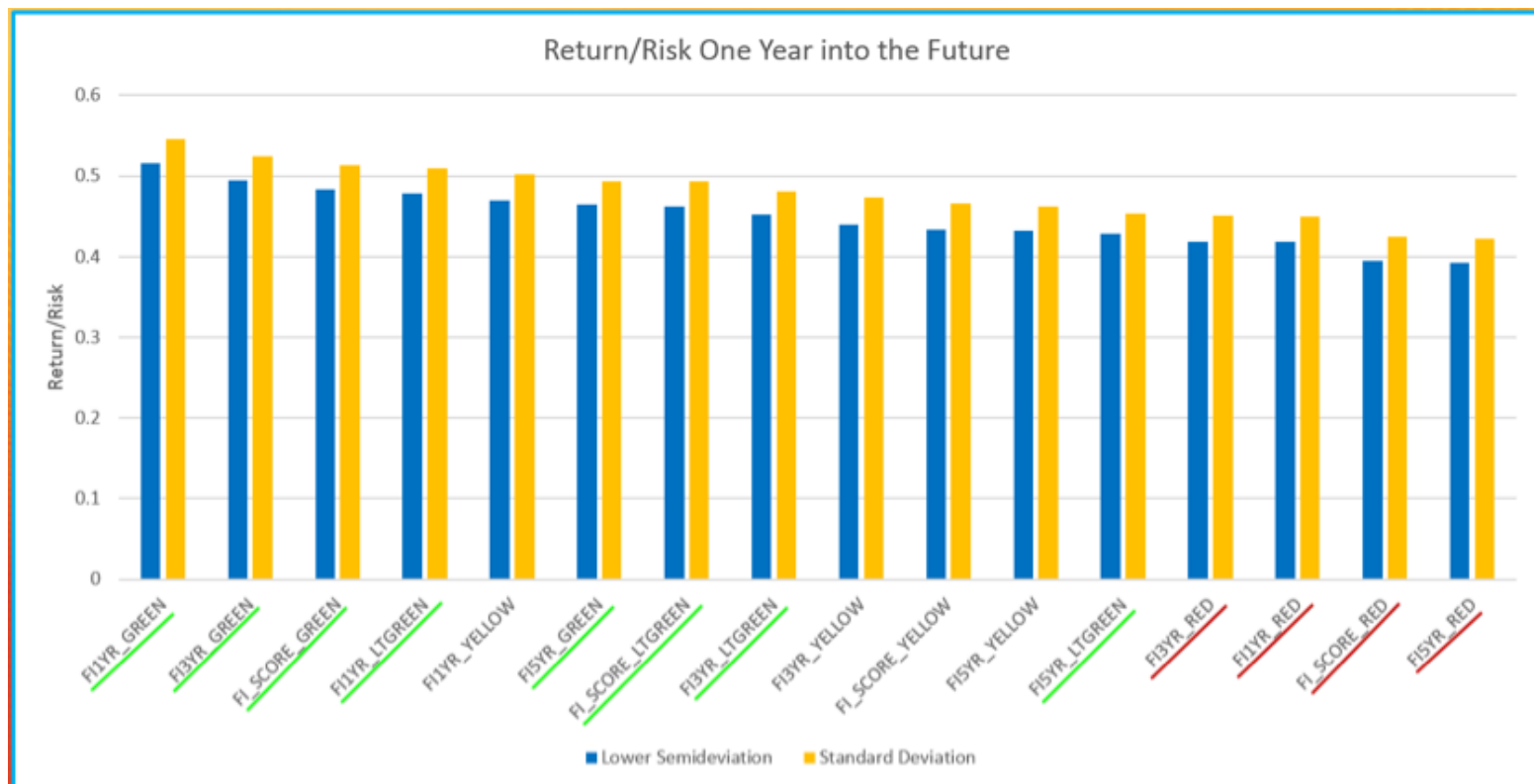
Comparison of Annualized Returns: Higher (Green) is Better

The following chart shows the annualized returns we computed, ordered from highest generated returns to lowest. The fi360 green scores tend to be towards the left, the higher performing group, while the fi360 red scores tend to be towards the right, the lower performing group.



Comparison of Return to Risk Ratios

The following chart shows the ratios of the annualized returns ordered from highest ratios to lowest ratios. Again, the green scores tend towards the left and the red scores tend towards the right. Mutual funds with higher fiduciary scoring had better overall performance as well as better risk adjusted performance during the study period.



Stability of fi360 scores

If a manager created a portfolio based on the fi360 scores, how frequently would the portfolio need to be updated or revised? To the extent the scores displayed frequent changing, portfolios might incur greater transactions costs reducing overall portfolio performance.

To understand the “stability” of the fi360 scores over time, the MacroRisk scientists computed all the pairs of the “spot scores” from a given date to a year past that date. (This computation was not performed using the average scores because of the persistence built into the rolling averages.) With these pairs, we conducted an analysis of the “transition probabilities” of the fi360 Fiduciary Score (not the one-, three-, five-, or 10-year average) in which we look at the combination of the score one date and the associated score a year following. The starting dates for this analysis are between January 2000 and March 2012 (with the last year after the March 2012 observation being March 2013 and used to compute the final transitions). There were about 800,000 “transitions” that we studied for this analysis. The universe for this analysis included all the funds that were in our database, including those which were no longer traded.

We found that the scores were quite well behaved as shown in the following table:

	<u>g</u>	<u>lg</u>	<u>y</u>	<u>r</u>	<u>d</u>
<u>g</u>	64.45%	23.37%	8.61%	1.71%	1.86%
<u>lg</u>	26.82%	37.48%	24.89%	7.25%	3.56%
<u>y</u>	8.72%	23.73%	39.45%	22.42%	5.68%
<u>r</u>	1.38%	6.41%	23.73%	56.94%	11.54%
<u>d</u>	0.00%	0.00%	0.00%	0.00%	100.00%

The “(g)reen”, “(l)ight (g)reen”, “(y)ellow”, “(r)ed”, and “(d)ead” vertical indicators show the starting position for funds and the corresponding letters (g, lg, y, r, d) along the top show the potential outcomes a year later. A “dead” fund is one that fell out of the database for whatever reason. Once a fund is “dead”, it is in a “trapping state”

such that the probability of next year’s status also being dead is 100%.

The percentages in the table are the transition probabilities, showing the likelihood of outcome for each starting letter. This is a bit technical, but the sum of each ROW totals to 100% (since each row reflects all the possible outcomes for the given starting value). There is no meaning to summing the column scores.

From this, we see that there is a 64.45% chance that a green score will continue to be green a year later. Similarly, there is only a 1.7% chance that a green score will be a red score a year later. Likewise, there is a 56.94% chance that a red score will still be red a year later and only a 1.38% chance that it will be a green score a year later. Considering “green/light green” and “yellow/red” as two groups, then there is an 87% chance that a green score will still be green or light green a year later and there is an 80.67% chance that a red score will be red or yellow a year later.

Note that there is only a 1.86% chance that a green fund will be dead a year later but there is an 11.54% chance that a red fund will be dead a year later. This illustrates another advantage of not purchasing “red” scored funds: there is a lower probability of the fund needing to be replaced due to becoming unavailable to investors.

Overlaying fi360 scores with MacroRisk 5-Risks Screening

The MacroRisk Five-Risks screening criteria have been widely discussed in other forums (for example, IMCA’s Investments & Wealth Monitor, March/April 2014) and are comprised of a measure of capital market risk, behavioral risk, economic risk, attribution stability, and residual risk (a value-at-risk type measure).

Using MacroRisk Analytics, we screened the fi360 “green” category equity mutual funds to create an equally-weighted portfolio of those equity funds having fi360 one-year average “green” score that also met the Five-Risks criteria. A graph showing the reinvested value of these two portfolio strategies from March 31, 2002 through March 14, 2014 is shown below. The portfolio, with the additional low-volatility protection from the Five-Risks screening, earned over 100 bps per year in additional return while realizing a substantially lower standard deviation of returns.

From March 31, 2002 to March 14, 2014

Performance Comparison Chart(\$1 initial investment)



Returns Measures	Five Risks	F11YR_GREEN_EQUITY
Total Return	171.83%	129.45%
Annualized Ret.	8.72%	7.19%
TT Month Ret.	9.15%	17.64%
Ave. Daily Ret.	0.04%	0.03%
Annualized Mean Ret.	9.59%	8.78%
Std. Dev of Returns	0.1583	0.1927

Conclusion

This paper demonstrated the value provided by screening the equity mutual funds with the fi360 Fiduciary Score in conjunction with the Five-Risks methodology.

Used by itself, the group of mutual funds which are scored “green” in the fi360 rankings demonstrated superior returns to the group that was scored “red.” When MacroRisk’s Five-Risks screening is added as an overlay in conjunction with the fi360 fiduciary scoring, assets can be identified which may have better total return and downside risk than funds in the same fi360 “color group” that did not meet the Five-Risks criteria.

Incorporating fiduciary screening with screening for economic risk into a portfolio construction process is a well-documented process that can be easily incorporated into wealth management practices.