Performance evaluation & Morningstar Ratings for funds

Francesco Paganelli
Fund Analyst  -  EMEA Manager Research Team
Agenda

Introduction - Who we are

The Morningstar Rating

The Morningstar Analyst Rating
Who We Are
Morningstar

Our mission is to create great products that help investors reach their financial goals.

We have 3,800+ employees in 27 countries worldwide, providing local market expertise.

Our clients range in size from individual investors all the way up to the world’s top asset management firms.

<table>
<thead>
<tr>
<th>Financial Advisors</th>
<th>Asset Managers</th>
<th>Retirement</th>
<th>Individual Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>260,000 Independents &amp; Affiliates</td>
<td>1,500+ Global Firms</td>
<td>237,000 Plan Sponsors</td>
<td>9.3 mil Website Users</td>
</tr>
<tr>
<td>$8.8 bil Managed Portfolios</td>
<td>$80.9 bil Investment Advisory</td>
<td>$76.7 bil Retirement Solutions</td>
<td>24 mil Retirement Plan Participants</td>
</tr>
</tbody>
</table>

Manager Research Services

Morningstar’s Spectrum of Capabilities, from information to advice
Morningstar Research
Global Scope/Local Expertise

110
Fund, ETF and Alts Analysts

3,500
Funds

$10T
In Invested Fund Assets

500
ETFs

95%
Market cap of global ETF universe

1,600
Equities

92%
Market cap of top 9 global equity and fixed income indexes

500
Credit
As one of the industry’s most trusted voices, our research validates and extends the home office due diligence team’s recommendations.

**Managed Products**

Analyst reports on more than 4,000 managed products

110+ analysts around the world providing global coverage

Data includes analyst research and Morningstar statistics plus portfolio and performance information, style-specific benchmarks, fee and expense details, and operations information

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**Equity Qualitative**

120+ analysts covering 1,600 stocks

12: *The Wall Street Journal* “Best on the Street” winners, the most of any firm

6.3% annualized outperformance of the Morningstar® Wide Moat Focus IndexSM since 2002

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**Equity Quantitative**

70,000 quantitative equity reports

26,500 additional companies covered compared to analyst rating

6% annualized outperformance of our most undervalued quintile of stocks compared to the most overvalued since June 2002

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**Corporate Credit**

225 basis point average cumulative outperformance of our Investment Grade Best Ideas compared to the Morningstar® Corporate Bond IndexSM

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**Structured Credit**

200+ firms trust Morningstar to identify credit risk

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990+ credit notes published

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1 In comparison to the S&P 500
2 As of April 31, 2014
3 Throughout 2013
Morningstar is a leading global and independent equity research provider. Our long-term outlook and emphasis on economic moats, or sustainable competitive advantages, differentiates our research and has proven to drive long-term outperformance.
Morningstar Approach to Equity Research

1. Fundamental Analysis
   - Analyst conducts company and industry research:
     - Financial statement analysis
     - Channel checks
     - Trade show visits
     - Industry and company reports and journals
     - Conference calls
     - Management and site visits

2. Economic Moat Rating
   - Analyst rates the strength of competitive advantage, or moat:
     - None, Narrow, or Wide
     - Advantages that confer a moat:
       - High switching costs (Microsoft)
       - Cost advantage (Wal-Mart)
       - Intangible assets (Johnson & Johnson)
       - Network effect (MasterCard)
       - Efficient Scale (Lockheed Martin)

3. Company Valuation
   - Analyst considers past financial results and focuses on competitive position and future prospects to forecast cash flows.
   - Analyst enters assumptions into Morningstar’s proprietary discounted cash flow model.

4. Fair Value Estimate
   - Analyst uses a discounted cash flow model to develop a Fair Value Estimate, which serves as the foundation for the Morningstar Rating™ for stocks.

5. Uncertainty Assessment
   - The analyst then evaluates the range of potential intrinsic values for the company and assigns an uncertainty rating: Low, Medium, High, Very High, or Extreme.
   - This uncertainty rating determines the margin of safety required before the analyst recommends the stock. The higher the uncertainty, the wider the margin of safety.

The current stock price relative to Morningstar’s Fair Value Estimate, adjusted for uncertainty, determines the Morningstar Rating for stocks.

The Morningstar Rating for stocks is updated each evening after the market closes.
Sources of Economic Moats
Morningstar’s Unique and Consistent ‘Intrinsic Value’ Approach

- **Focus on business value**, not what others will pay
- **Primary research**, formulating our own opinions by reading financial filings & trade journals, visiting companies, talking to competitors & customers and attending industry conferences
- **Take a long-term perspective** backed by rigorous DCF models
- Identify competitive advantages—“economic moats”—to uncover intrinsic value, and competitive position
- The ability to generate **ROIC above cost of capital** is the primary test of shareholder value creation
- **Intrinsic value** principles work for both ‘value’ and ‘growth’ stocks
- **Consistent approach** among analysts vs. varied fiefdoms of sell-side
Manager Research

Evolution of Morningstar’s Fund Ratings

While Morningstar’s fund analysts worldwide have long shared a common research philosophy, the Morningstar Analyst Rating™ brings the teams’ research processes together into a single, harmonized global rating system.
Our comprehensive team of independent analysts evaluates products and delivers informed commentary and research on ETFs globally.

Quality Data
Morningstar analysts make use of our high-quality data to analyze products and build indexes. Our coverage is expansive in its breadth and depth, representing markets worldwide and 416,000 investments.

Comprehensive Content
We look to our experts—well-known in the market—to communicate through a variety of media articles, videos, presentations, and social media.

Widespread Coverage
Our team reports on 750+ ETFs, representing more than 80% of global assets under management.
Putting the Research to Work

Analyst Reports

Best Investment Ideas

Model Portfolios

Newsletters

Data Pages

Analyst Videos

Market Commentary and Industry Trends

Investor Educational Materials
General Concepts

▶ Strategy – Fund – Share class:
  ▶ Fund Id vs Share Class Id

▶ NAV

▶ Costs
  ▶ Ongoing Charges (Spese correnti)
  ▶ Performance fee
  ▶ Transaction costs
General Concepts 2

- Currency hedge
- Base currency
- ISIN
- Style Box
- Benchmark
- UCITS
Performance evaluation

- We care about risk and return
## Risk-Adjusted Ratio Summary

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Performance (Numerator)</th>
<th>Risk (Denominator)</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sortino</td>
<td>Excess return rel to benchmark</td>
<td>Downside deviation</td>
<td>Conservative measure</td>
</tr>
<tr>
<td>Information</td>
<td>Excess return rel to benchmark</td>
<td>Tracking Error – std dev of the return difference between the portfolio and the benchmark</td>
<td>Mgr performance relative to benchmark</td>
</tr>
<tr>
<td>Treynor</td>
<td>Excess return rel to risk free</td>
<td>Beta – risk measure based on a comparison of the volatility of the funds returns to the benchmark</td>
<td>Peer evaluation using an assumed level of risk</td>
</tr>
<tr>
<td>Calmar</td>
<td>Compound annual return</td>
<td>Maximum Drawdown - peak to trough decline during a specific record period of an investment of fund</td>
<td>Volatile investment; not concerned w/comparison to benchmark or market</td>
</tr>
<tr>
<td>Sharpe</td>
<td>Excess return rel to risk free</td>
<td>Standard Deviation</td>
<td>Peer evaluation using overall risk</td>
</tr>
</tbody>
</table>
Our Solution: the Morningstar Rating

Key characteristics:

- US Rating launched in 1985, enhanced in 2002
- Quantitative assessment of a fund’s past performance
- Peer group – Morningstar Category
- Ratings are based on fund’s cost- and risk-adjusted returns
- Based on generally accepted investor optimization problem from economic theory (micro-foundations)
- Same methodology globally

- Does not assume a specific probability distribution for returns (non-parametric)
- **More weight to downside variation** (concave function and risk averse investors)
Investment Funds’ classification

Morningstar Categories

Critical step of the process

▶ Dedicated team of analyst who rely on local fund analysts’ inputs

▶ Principles:
  ▶ Proper evaluation
  ▶ Transparency
  ▶ Independence
  ▶ Stability

▶ Constantly reviewed to ensure it meets investors’ needs and market developments

▶ We analyze holdings data, performance attribution, correlations, stated mandate, investment limits, style, biases etc.
Morningstar Categories

- In Europe alone we classify more than 100,000 share classes
- 300+ categories
- Highly fragmented industry compared with US
- More funds, less assets = Fewer economies of scale passed to investors

- In general, funds in the same category can be considered reasonable substitutes for the purposes of portfolio construction.
Utility function

**Morningstar Rating: theoretical basis**

- Decreasing marginal utility – concave function
- Constant relative risk aversion (CRRA)
- Widely used in microeconomic and macroeconomic research

\[
U(E(r)) > E(U(r))
\]

\[
E(U(r)) = p \cdot U(r_L) + (1 - p) \cdot U(r_H)
\]
Utility function

**Morningstar Rating: theoretical basis**

- Constant relative risk aversion (CRRA) with $\gamma = 2$
- When Morningstar averages the level of utility across many months for a fund, lower returns have much lower levels of utility or satisfaction and this brings down the average

$$U = z + w(1+ER)^{-\gamma}$$
The key ingredient
**Morningstar Risk Adjusted Return (MRAR)**

- Morningstar Risk-Adjusted Return (MRAR) is the «guaranteed», steady return that provides the same level of utility to the investor as the specific combination of returns exhibited by the fund.
- MRAR is the main ingredient for the Morningstar Rating (aka “star rating”).

\[
Y = \text{risk aversion} \\
\text{ER}_{CE} = \text{excess return certainty equivalent} \\
\text{ER} = \text{return}
\]
Morningstar Rating in Four Steps (1/4)

1. Calculate monthly **Total Return** for month \( t \)

\[
TR_t = \left\{ \frac{P_e}{P_b} \prod_{i=1}^{n} \left( 1 + \frac{D_i}{P_i} \right) \right\} - 1
\]

---

**Total Return**

**3 Yr**

<table>
<thead>
<tr>
<th>Fund</th>
<th>3 Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Fund A</td>
<td>34.43</td>
</tr>
<tr>
<td>Growth Fund Inv</td>
<td>23.30</td>
</tr>
</tbody>
</table>
2. Adjust monthly Total Return for a factor that reflects front loads, deferred loads and redemption fees as reported by the fund companies in the official documentation.

\[ LR_c = (1 + TR_c)(1 - F)(1 - R) - D(1 - F) \frac{\min(P_0, P_1)}{P_0} \]

where

- \( LR_c \) = cumulative load-adjusted return for three, five, or ten years
- \( TR_c \) = cumulative total return for three, five, or ten years
- \( F \) = maximum front load
- \( R \) = redemption fee for the time period being measured
- \( D \) = deferred load for the time period being measured
- \( P_0 \) = beginning-of-period NAV per share
- \( P_1 \) = end-of-period NAV per share

<table>
<thead>
<tr>
<th>Fund</th>
<th>Total Return 3 Yr</th>
<th>Load-Adj Return 3 Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Fund A</td>
<td>34.43</td>
<td>31.80</td>
</tr>
<tr>
<td>Growth Fund Inv</td>
<td>23.30</td>
<td>23.30</td>
</tr>
</tbody>
</table>
Morningstar Rating in Four Steps (3/4)

- 3. Calculate **Morningstar Return**: adjust load-adjusted return for the risk-free rate, same for all funds in a particular category

- Geometric excess return over the risk-free rate

- Europe: Different categories are paired with different risk-free rates

- The annualized geometric mean of these excess returns is known as Morningstar Return

\[ ER_t = \frac{1+LR_t}{1+RF_t} - 1 \]

\[ \text{Morningstar Return} = \left[ \prod_{t=1}^{T} (1+ER_t) \right]^{\frac{12}{T}} - 1 \]

<table>
<thead>
<tr>
<th></th>
<th>Total Return 3 Yr</th>
<th>Load-Adj Return 3 Yr</th>
<th>Morningstar Return 3 Yr</th>
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<tr>
<td>Focus Fund A</td>
<td>34.43</td>
<td>31.80</td>
<td>29.40</td>
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<tr>
<td>Growth Fund Inv</td>
<td>23.30</td>
<td>23.30</td>
<td>21.06</td>
</tr>
</tbody>
</table>
4. Adjust for risk and calculate **Morningstar Risk-Adjusted Return**: expected utility theory to model how investors trade off return and risk (i.e. Certainty Equivalent)

\[
MRAR(2) = \left[ \frac{1}{T} \sum_{t=1}^{T} \left( 1 + ER_t \right)^{-2} \right]^{\frac{12}{2}} - 1
\]

*Morningstar Risk = Morningstar Return – Morningstar Risk-Adj Ret

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### Morningstar Rating in Four Steps (4/4)

<table>
<thead>
<tr>
<th>Total Return 3 Yr</th>
<th>Load-Adj Return 3 Yr</th>
<th>Morningstar Return 3 Yr</th>
<th>Morningstar Risk-Adj Return 3 Yr</th>
<th>Morningstar Risk 3 Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Fund A</td>
<td>34.43</td>
<td>31.80</td>
<td>29.40</td>
<td>26.37</td>
</tr>
<tr>
<td>Growth Fund Inv</td>
<td>23.30</td>
<td>23.30</td>
<td>21.06</td>
<td>17.11</td>
</tr>
</tbody>
</table>
Categories and Morningstar Rating

- Pull all funds in a category with data for the time period being measured (3-year, 5-year, or 10-year)
- Assign fractional weights to each share class in a multi-share fund
- Rank all funds in category on MRAR in descending order
- Assign stars based on bell curve distribution

![Bar chart showing star ratings and distribution]

- ★: 10%
- ★★: 22.5%
- ★★★: 35%
- ★★★★: 22.5%
- ★★★★★: 10%
## Individual Star Rating assignment

<table>
<thead>
<tr>
<th>Name</th>
<th>Ticker</th>
<th>Mstar Risk-Adjusted Ret 5 Yr</th>
<th>Fractional Weight 5 Years</th>
<th>Cumulative Weight</th>
<th>Mstar Rating 5 Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Inv Lifetime 2020 Instl</td>
<td>PLWIX</td>
<td>6.339</td>
<td>0.17</td>
<td>0.175</td>
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<tr>
<td>Principal Inv LifeTime 2020 Pfd</td>
<td>PTBPX</td>
<td>6.061</td>
<td>0.17</td>
<td>0.335</td>
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<td>Principal Inv LifeTime 2020 Sel</td>
<td>PTBUX</td>
<td>5.931</td>
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<td>0.504</td>
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<td>Principal Inv LifeTime 2020 AdvPfd</td>
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<td>0.674</td>
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<td>Principal Inv LifeTime 2020 J</td>
<td>PLFJX</td>
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<td>0.17</td>
<td>0.834</td>
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<td>Principal Inv LifeTime 2020 AdvSel</td>
<td>PTBNX</td>
<td>5.548</td>
<td>0.17</td>
<td>1.004</td>
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<tr>
<td>Fidelity Freedom 2020</td>
<td>FFDFX</td>
<td>4.691</td>
<td>1.00</td>
<td>2.003</td>
<td></td>
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<tr>
<td>Barclays Global Investors LP 2020 I</td>
<td>STLCX</td>
<td>3.963</td>
<td>0.50</td>
<td>2.503</td>
<td></td>
</tr>
<tr>
<td>Barclays Global Investors LP 2020 R</td>
<td>LPRCX</td>
<td>3.592</td>
<td>0.50</td>
<td>3.003</td>
<td></td>
</tr>
<tr>
<td>Wells Fargo Advantage DJ Target 2020 Adm</td>
<td>WFLPX</td>
<td>2.774</td>
<td>0.20</td>
<td>3.203</td>
<td></td>
</tr>
<tr>
<td>NestEgg Dow Jones U.S. 2020 I</td>
<td>NETWX</td>
<td>2.621</td>
<td>1.00</td>
<td>4.202</td>
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<tr>
<td>Wells Fargo Advantage DJ Target 202 A LW</td>
<td>STTRX.LW</td>
<td>2.472</td>
<td>0.20</td>
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<td>Wells Fargo Advantage DJ Target 202 C</td>
<td>WFLAX</td>
<td>1.773</td>
<td>0.20</td>
<td>4.601</td>
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<td>Wells Fargo Advantage DJ Target 202 B</td>
<td>STP8X</td>
<td>1.465</td>
<td>0.20</td>
<td>4.801</td>
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<td>Wells Fargo Advantage DJ Target 202 A</td>
<td>STTRX</td>
<td>1.265</td>
<td>0.20</td>
<td>5.00</td>
<td></td>
</tr>
</tbody>
</table>

- **Cumulative weight**

  | 10% of 5  | 0.5 | 0.5 |
  | 22.5% of 5 | 1.125 | 1.625 |
  | 35% of 5   | 1.75  | 3.375 |
  | 22.5% of 5 | 1.125 | 4.5  |
  | 10% of 5   | 0.5   | 5    |

Count off funds until 0.5 is reached but not exceeded. These funds receive 5 stars.

If a fund fails on the breakpoint it will start the next rating group.

Continue counting off funds until the total number reaches but does not exceed 1.625.
The additional funds receive 4 stars.

Continue counting off funds until the total number reaches but does not exceed 3.375.
The additional funds receive 3 stars.

Continue counting off funds until the total number reaches but does not exceed 4.5.
The additional funds receive 2 stars.

The remaining funds receive one star.
Why did the fund’s rating go down?

- Reached 5- / 10-yrs anniversary
- Edge of a breakpoint (small range of returns for a category = few basis points make the difference)
- Difference in share classes rating can occur
  - Different fees
  - Different time periods
- What affects the rating the most?
  - Risk
  - Costs
  - Return

Rating Analysis Report in Direct:
Morningstar Rating: Example

Fund A and Fund B have the following excess returns. Their compounded return is the same, but Fund B has provided less regular returns than Fund A.

The MRAR calculations

<table>
<thead>
<tr>
<th></th>
<th>Fund A (%)</th>
<th>Fund B (%)</th>
<th>(1 + r_c)^(-2) Fund A</th>
<th>(1 + r_c)^(-2) Fund B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>0.50</td>
<td>0.10</td>
<td>0.9901</td>
<td>0.9980</td>
</tr>
<tr>
<td>Feb</td>
<td>1.00</td>
<td>2.00</td>
<td>0.9803</td>
<td>0.9612</td>
</tr>
<tr>
<td>Mar</td>
<td>0.50</td>
<td>-0.90</td>
<td>0.9901</td>
<td>1.0182</td>
</tr>
<tr>
<td>Apr</td>
<td>1.00</td>
<td>0.50</td>
<td>0.9803</td>
<td>0.9901</td>
</tr>
<tr>
<td>May</td>
<td>0.50</td>
<td>3.82</td>
<td>0.9901</td>
<td>0.9277</td>
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<tr>
<td>Jun</td>
<td>1.00</td>
<td>0.60</td>
<td>0.9903</td>
<td>0.9881</td>
</tr>
<tr>
<td>Jul</td>
<td>0.50</td>
<td>0.70</td>
<td>0.9901</td>
<td>0.9861</td>
</tr>
<tr>
<td>Aug</td>
<td>1.00</td>
<td>0.00</td>
<td>0.9903</td>
<td>1.0000</td>
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<tr>
<td>Sep</td>
<td>0.50</td>
<td>-0.20</td>
<td>0.9901</td>
<td>1.0040</td>
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<tr>
<td>Oct</td>
<td>1.00</td>
<td>-1.50</td>
<td>0.9803</td>
<td>1.0307</td>
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<tr>
<td>Nov</td>
<td>0.50</td>
<td>1.00</td>
<td>0.9901</td>
<td>0.9803</td>
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<tr>
<td>Dec</td>
<td>1.00</td>
<td>3.00</td>
<td>0.9903</td>
<td>0.9426</td>
</tr>
</tbody>
</table>

Compounded 9.38 9.38

SUM 11.8222 11.8270
SUM/12 0.9852 0.9856

((SUM/12)^(-6)-1) is MRAR 9.37% 9.10%
Example

- Italy Equity
- AcomeA
How Star Rating predicts success

What can we say about future (relative) performance?

- 2005 – “Rating the Star Rating”
- “Rating was directionally right [...] however the amount of outperformance was often modest”

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Morningstar Rating 6-30-02</th>
<th>3-Yr Return (%)</th>
<th>3-Yr Return % Rank</th>
<th>3-Yr Std Dev*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Equity</td>
<td>★★★★★★</td>
<td>10.1</td>
<td>43</td>
<td>14.1</td>
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<tr>
<td></td>
<td>★★★★★</td>
<td>9.3</td>
<td>49</td>
<td>14.0</td>
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<tr>
<td></td>
<td>★★★★</td>
<td>9.2</td>
<td>50</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>★★★</td>
<td>9.0</td>
<td>53</td>
<td>15.2</td>
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<tr>
<td></td>
<td>★</td>
<td>8.1</td>
<td>54</td>
<td>17.3</td>
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<tr>
<td>International Equity</td>
<td>★★★★★★</td>
<td>15.3</td>
<td>43</td>
<td>15.9</td>
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<tr>
<td></td>
<td>★★★★★</td>
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<td>★</td>
<td>16.7</td>
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<tr>
<td>Taxable Bond</td>
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<td>7.4</td>
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<td></td>
<td>★★★★</td>
<td>6.1</td>
<td>50</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>★★</td>
<td>5.4</td>
<td>57</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>★</td>
<td>5.7</td>
<td>58</td>
<td>7.3</td>
</tr>
</tbody>
</table>

How Star Rating predicts success

What can we say about future (relative) performance?

- 2010 – “How Expense Ratios and Star Ratings Predict Success”

- We took a snapshot of star ratings and expense ratios from 2005 through 2008 and then tracked their progress through March 2010 in terms of Total Return, Subsequent Star Rating and Success Ratio

- The success ratio tells you what percentage of funds in a given group survived and outperformed their peers – no survivorship bias

- The star rating helped investors make better decisions in every example measured by the success ratio. In general, 5-star mutual funds beat 1-star funds, although there were exceptions. Stars guided investors to better results in 59 out of 70 (84%) observations.

- In that 2005 class, fully 53% of 5-star international equity funds survived and outperformed, whereas a mere 13% of 1-star funds survived and outperformed.
How Star Rating predicts success

What can we say about future (relative) performance?

Takeaway

« If there's anything in the whole world of mutual funds that you can take to the bank, it's that expense ratios help you make a better decision. In every single time period and data point tested, low-cost funds beat high-cost funds.»

« For the 2005 group, we found that 48% of domestic-equity funds in the cheapest quintile survived and outperformed versus 24% in the priciest quintile. Put another way, funds in the cheapest quintile of domestic equity were twice as likely to succeed as those in the priciest quintile »

► The cheapest quintile from 2005 in domestic equity returned an annualized 3.35% versus 2.02% for the most expensive quintile over the ensuing five years.
How Star Rating predicts success

**What can we say about future (relative) performance?**

- **2014 – Mutual Funds’ Five-Star Curse**, WSJ, Sept. 7, 2014

  - “of funds that had a five-star overall rating as of July 2004, 37% had lost one star 10 years later. But 31% lost two stars, 14% dropped three, and 3% lost four. Only 58, or 14%, of the 403 funds that had five stars in July 2004 carried the same rating through July 2014, Morningstar says.”

  - “Some mutual funds aren’t good at adapting their strategy to their growth, says Russel Kinnel, director of fund research at Morningstar”

- Past performance is no guarantee of future returns

- Change in the team/manager

- A fund’s star rating can change because of new categories, new funds being added to the category, funds changing categories

---

**Yesteryear’s Stars Go Down a Notch (or More)**

The 10 biggest five-star mutual funds from 2004, and their ratings now

<table>
<thead>
<tr>
<th>Fund</th>
<th>Star Rating in 2004</th>
<th>Rating Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Funds’ Growth Fund of America</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>Pimco Total Return (Institutional class)</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>American Funds’ Income Fund of America</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>Fidelity Contrafund</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>American Funds’ American Balanced</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>Dodge &amp; Cox Stock</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>Fidelity Low-Priced Stock</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>Vanguard Wellington Fund Investor</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>American Funds’ Capital World Growth &amp; Income</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
<tr>
<td>Vanguard GNMA Fund Investor</td>
<td>★★★★★</td>
<td>★★★</td>
</tr>
</tbody>
</table>

Source: Morningstar | The Wall Street Journal
How Star Rating predicts success

**What can we say about future (relative) performance?**

▶ *The Fund Winner Curse Is an Optical Illusion*

John Rekenthaler, Vice President of Research for Morningstar.

<table>
<thead>
<tr>
<th>Star Rating Distribution</th>
<th>Overall Fund Universe (July 2004)</th>
<th>Former 5-Star Funds (July 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-stars</td>
<td>10%</td>
<td>14%</td>
</tr>
<tr>
<td>4-stars</td>
<td>23%</td>
<td>37%</td>
</tr>
<tr>
<td>3-stars</td>
<td>35%</td>
<td>31%</td>
</tr>
<tr>
<td>2-stars</td>
<td>23%</td>
<td>14%</td>
</tr>
<tr>
<td>1-star</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Average Rating</strong></td>
<td>3.0</td>
<td>3.4</td>
</tr>
</tbody>
</table>

On average...

- The State of the drunk at his AVERAGE position is ALIVE.
- But the AVERAGE state of the drunk is DEAD.
Manager Research Services

**Moving Beyond Past Performance**

- **Morningstar Rating**

  ![Stars](image)

  - *Achievement Test*
Manager Research Services
Sharpening The Focus On Investment Fundamentals

Morningstar Analyst Rating

- Gold
- Silver
- Neutral
- Bronze
- Negative

- Aptitude Test
Manager Research
History of Qualitative Work

Since 1986, Morningstar has provided independent qualitative research on managed products. The Morningstar Analyst Rating is supported by a consistent global methodology.
The Morningstar Analyst Rating is: **Independent, Forward Looking, Not a Market Call**

Source: Morningstar, Inc. For illustrative purposes only.
Morningstar Analyst Rating: Objective

- Identify those funds which we believe should be able to outperform a relevant benchmark and/or peer group, within the context of the level of risk taken, over the longer term (i.e. full market cycle).

- Help investors and fund selectors understand the suitability of funds for an intended purpose and give them clear expectations for the likely behaviour of funds in different market environments.

- The Analyst Rating does not express a view on a given asset class or peer group; rather, it seeks to evaluate each fund within the context of its objective, an appropriate benchmark, and peer group.

- Independence
- Benefit of investors, not fund companies
- Coverage: investors’ needs, analysts’ discretion
Manager Research

Five Pillars of the Morningstar Analyst Rating

Our five-pillar research framework reinforces a consistent, long-term investment process and gives advisors the resources they need to provide justified recommendations that are well suited to client needs.

<table>
<thead>
<tr>
<th>People</th>
<th>Process</th>
<th>Parent</th>
<th>Performance</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Quality/Experience</td>
<td>Security Selection/Idea Generation</td>
<td>Structure/Ownership</td>
<td>Rolling Risk-Adjusted Returns vs. Style Benchmark</td>
<td>Expense Ratio Relative to Peer Group</td>
</tr>
<tr>
<td>Team Depth</td>
<td>Valuation Discipline</td>
<td>Organization Stability/Financial Strength</td>
<td>Downside Statistics</td>
<td></td>
</tr>
<tr>
<td>Team Continuity</td>
<td>Portfolio Construction/Risk Management</td>
<td>Culture/Stewardship</td>
<td>Attribution</td>
<td></td>
</tr>
<tr>
<td>Alignment of Interests</td>
<td>Capacity</td>
<td>Regulatory/Compliance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 decades of fund research wrapped in 5 key areas crucial to predicting future success
People

- Experience & skills
- Stability
- Fit & structure
- Manager workload
- Decision making
- Communication
- Alignment of interests
Process

- Clear, sensible, repeatable and sustainable?
- Portfolio construction in relation to the fund’s objective
- Investment philosophy
- Key «edge»
- Fit of process with available resources
- Expectations for performance, bias
Parent

- **Stewardship**: the careful and responsible management of something entrusted to one's care (Merriam Webster)

- Manager retention rate

- The degree to which the management company's and fund board's interests are aligned with fund shareholders

- The degree to which shareholders can expect their interests to be protected from potentially conflicting interests of the management company.

- Regulatory compliance
Manager Research

Stewardship Grade and Parent Pillar Methodology

We prefer funds within strong parent organizations focused on responsible stewardship of investor assets. Although other factors may have more immediate impact, they would not be sustainable without the firm’s backing.

<table>
<thead>
<tr>
<th>Corporate Culture</th>
<th>Manager Incentives</th>
<th>Fees</th>
<th>Regulatory History</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stewardship or Salesmanship?</strong></td>
<td><strong>Are Managers’ Interests Aligned?</strong></td>
<td><strong>Are the Strategies a Good Value?</strong></td>
<td><strong>Does the Firm Comply with Regulations?</strong></td>
</tr>
<tr>
<td>What defines the firm’s corporate culture?</td>
<td>Do managers invest meaningfully in the strategies they run?</td>
<td>Are the strategies priced competitively relative to similar peers?</td>
<td>Has the firm violated industry regulations?</td>
</tr>
<tr>
<td>Is the firm’s primary interest asset gathering or care of capital?</td>
<td>Are managers paid to deliver strong long-term returns?</td>
<td></td>
<td>If so, how has the firm made right?</td>
</tr>
<tr>
<td>Is the investment staff stable and talented?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the firm focus on known strengths or unproven trends?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Performance

- We do not believe past performance is necessarily predictive of future results
- Smaller weight in our evaluation process
- Is the fund delivering? How? Why?
  - Performance attribution and contribution
- Expectations vs reality
- Risks?
- Behavior under different market conditions
- What has driven results?
Price

- Fees compared with similar offerings
- Which quintile do they land?
- Performance fee:
  - Structure
  - HWM?
  - Benchmark appropriate?
Thought Leadership example: Active vs Passive

Active/Passive Barometer – US funds, June 2015

### Exhibit 1  Active Funds’ Success Rate by Category (%)

<table>
<thead>
<tr>
<th>Category</th>
<th>1-Year</th>
<th>3-Year</th>
<th>5-Year</th>
<th>10-Year (Lowest Cost)</th>
<th>10-Year (Highest Cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Large Blend</td>
<td>32.7</td>
<td>35.6</td>
<td>25.1</td>
<td>21.6</td>
<td>29.7</td>
</tr>
<tr>
<td>U.S. Large Value</td>
<td>21.3</td>
<td>49.0</td>
<td>25.4</td>
<td>38.2</td>
<td>68.3</td>
</tr>
<tr>
<td>U.S. Large Growth</td>
<td>42.3</td>
<td>26.0</td>
<td>12.2</td>
<td>16.9</td>
<td>38.9</td>
</tr>
<tr>
<td>U.S. Mid Blend</td>
<td>36.5</td>
<td>34.5</td>
<td>23.8</td>
<td>13.7</td>
<td>21.7</td>
</tr>
<tr>
<td>U.S. Mid Value</td>
<td>20.9</td>
<td>34.8</td>
<td>13.5</td>
<td>54.4</td>
<td>68.2</td>
</tr>
<tr>
<td>U.S. Mid Growth</td>
<td>48.0</td>
<td>37.0</td>
<td>31.1</td>
<td>26.8</td>
<td>47.1</td>
</tr>
<tr>
<td>U.S. Small Blend</td>
<td>40.7</td>
<td>35.5</td>
<td>37.1</td>
<td>38.9</td>
<td>35.7</td>
</tr>
<tr>
<td>U.S. Small Value</td>
<td>25.2</td>
<td>22.0</td>
<td>47.7</td>
<td>48.4</td>
<td>52.2</td>
</tr>
<tr>
<td>U.S. Small Growth</td>
<td>51.4</td>
<td>40.8</td>
<td>30.2</td>
<td>24.4</td>
<td>33.8</td>
</tr>
<tr>
<td>Foreign Large Blend</td>
<td>47.0</td>
<td>44.8</td>
<td>52.8</td>
<td>40.2</td>
<td>58.5</td>
</tr>
<tr>
<td>Diversified Emerging Markets</td>
<td>58.2</td>
<td>70.4</td>
<td>65.8</td>
<td>36.6</td>
<td>47.4</td>
</tr>
<tr>
<td>Intermediate Term Bond</td>
<td>47.9</td>
<td>73.0</td>
<td>69.7</td>
<td>42.4</td>
<td>54.9</td>
</tr>
</tbody>
</table>

Source: Morningstar. Data and calculations as of 12/31/14.
Thought Leadership example: Costs
Thought Leadership example: Manager Ownership

Manager investment levels from 2009 and then track five-year performance from that point on.

Funds grouped by top manager investment range and then determined the % who survived and outperformed their category peers (Success rate).

Takeaway: Invest with managers who eat their own cooking.

<table>
<thead>
<tr>
<th>Broad Group</th>
<th>Bucket</th>
<th>Success Rate (%)</th>
<th>Success Rate MRAR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Equity</td>
<td>$0</td>
<td>28.99</td>
<td>23.63</td>
</tr>
<tr>
<td></td>
<td>$1-$10,000</td>
<td>28.74</td>
<td>26.44</td>
</tr>
<tr>
<td></td>
<td>$10,001-$50,000</td>
<td>29.65</td>
<td>23.26</td>
</tr>
<tr>
<td></td>
<td>$50,001-$100,000</td>
<td>33.52</td>
<td>25.14</td>
</tr>
<tr>
<td></td>
<td>$100,001-$500,000</td>
<td>36.52</td>
<td>29.97</td>
</tr>
<tr>
<td></td>
<td>$500,001-$1,000,000</td>
<td>31.86</td>
<td>27.43</td>
</tr>
<tr>
<td></td>
<td>$1,000,001 or greater</td>
<td>39.08</td>
<td>33.19</td>
</tr>
<tr>
<td>Intl Equity</td>
<td>$0</td>
<td>31.52</td>
<td>26.08</td>
</tr>
<tr>
<td></td>
<td>$1-$10,000</td>
<td>52.17</td>
<td>43.48</td>
</tr>
<tr>
<td></td>
<td>$10,001-$50,000</td>
<td>34.69</td>
<td>24.49</td>
</tr>
<tr>
<td></td>
<td>$50,001-$100,000</td>
<td>48.57</td>
<td>34.29</td>
</tr>
<tr>
<td></td>
<td>$100,001-$500,000</td>
<td>45.71</td>
<td>37.14</td>
</tr>
<tr>
<td></td>
<td>$500,001-$1,000,000</td>
<td>43.75</td>
<td>37.50</td>
</tr>
<tr>
<td></td>
<td>$1,000,001 or greater</td>
<td>67.86</td>
<td>50.00</td>
</tr>
</tbody>
</table>

This fund is a strong choice for the patient investor.

**Manager Research**

**Global Fund Report: Due Diligence Report**

13 Jun, 2016 | Returns have picked up once again at Aberforth UK Small Companies. While the very long-term record here is strong, the fund’s value 5 stars mean it’s suitable for investors seeking a diversified portfolio. The performance is impressive, with annualised returns of 7.76% over the past 10 years. In the short term, the fund has performed well, as seen by the positive performance over the past 12 months.

Check manager’s track record for more information.

---

**Manager's Commentary**

The fund’s manager, David Ross, has been with the company since 2001 and is known for his focus on small-cap stocks. He has a strong track record and is respected in the industry for his ability to pick winners. The fund’s performance has been consistently strong, with returns above the benchmark over the past few years.

---

**Performance Chart**

The performance chart shows the fund’s annualised returns over the past 10 years, with comparisons to the benchmark index. The chart indicates that the fund has outperformed the benchmark consistently.

---

**Risk Analysis**

The risk analysis section provides information on the fund’s volatility, correlation with the benchmark, and other risk metrics. This helps investors understand the potential risks associated with investing in the fund.

---

**Manager Insights**

The manager insights section includes the manager’s comments on the current market conditions, trends, and his investment strategies. This provides valuable insights into the manager’s perspective on the market and his approach to managing the fund.

---

**Conclusion**

In summary, Aberforth UK Small Companies is a strong choice for investors seeking a diversified portfolio with proven performance. The manager’s focus on small-cap stocks and his strong track record make this fund a solid option for long-term investors. However, as with any investment, it’s important to review the fund’s performance and risk characteristics before making a decision.

---

**Further Reading**

For more information, please visit the fund’s official website or contact the fund administrator directly.
Manager Research

Global Scope/Local Expertise

115
Analysts

4,000
Funds

$10 Trillion
In Invested Assets
Manager Research
Independent, Team-Driven Model

Our analyst team works collectively to determine ratings. The process includes extensive holdings- and returns-based research, manager interviews, and a ratings committee to ensure consistency and rigorous peer review. Coverage is determined independently.

Pre-meeting evaluation
Manager Interview
Manager Research

**Hallmarks of the Morningstar Qualitative Approach**

- Heavily data-driven
- Holdings-based emphasis
- Stewardship
- Global Leverage
- Long-term, patient
Manager Research
Thematic Thought Leadership and Event-Driven Notes

White Papers & Research Studies

Pimco Research Notes
Manager Research Services
Global Scale, Local Expertise

Applying our global research process and resources

- 115 Analysts
- Lead / local
- Globally consistent process

USA/Canada
1390 Funds

Europe
1419 Funds

India
88 Funds

Australasia
418 Funds
In practice, our coverage is skewed towards positively rated funds as we prefer to dedicate analysts to funds we believe will be of interest to our research clients, but there is no set distribution across the rating scale.

**Manager Research**

**Distribution of EMEA Analyst Ratings**

US Open-End & Closed-End Universe; Data as of 4/24/2015.
Manager Research
Global Team Statistics

Our analysts each have, on average, more than a decade of industry experience across a wide range of sectors and investment types.

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Analysts</th>
<th>Average Industry Experience (Years)</th>
<th>Average Morningstar Experience (Years)</th>
<th>Number of CFAs</th>
<th>Number of Advanced Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>44</td>
<td>12.2</td>
<td>8.5</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>Asia/Pacific</td>
<td>30</td>
<td>9.8</td>
<td>4.0</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>EMEA</td>
<td>28</td>
<td>11.6</td>
<td>5.5</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Total/Average</td>
<td>102</td>
<td>11.2</td>
<td>6.0</td>
<td>32</td>
<td>55</td>
</tr>
</tbody>
</table>

As of 3/31/15
Analyst Rating Performance Reporting 2015-Q4
Alpha 12M Rolling Window – EMEA

Average Annualized Alpha 12M Rolling (%), Benchmark: Category Average

-1.11 0.38 0.85 0.83 1.28

Negative Neutral Bronze Silver Gold

Number of Funds

174 1115 1301 907 194

Negative Neutral Bronze Silver Gold

Source: Morningstar, Inc. as of 2015-12-31
Analyst Rating Performance Reporting 2015-Q4
Alpha 36M Rolling Window – EMEA

Average Annualized Alpha 36M Rolling (%), Benchmark: Category Average
- EMEA Funds 2002-03 to 2015-12

-1.06 0.50 0.85 0.83 1.41
Negative Neutral Bronze Silver Gold

Number of Funds

111 754 1008 798 171
Negative Neutral Bronze Silver Gold

Source: Morningstar, Inc. as of 2015-12-31
Analyst Rating Performance Reporting 2015-Q4
Alpha 60M Rolling Window – EMEA

Average Annualized Alpha 60M Rolling (%), Benchmark: Category Average

- EMEA Funds 2002-03 to 2015-12

Source: Morningstar, Inc. as of 2015-12-31
Manager Research
Moving to a Strategy Level Lens…

- Morgan Stanley Emerging Markets Debt
- Luxembourg Open-End Fund
- Insurance Product Fund
- United States Open-End Fund
- Separate Account
- Australia Open-End Fund