What Now—Active or Passive Management?

Examining Real Alpha and Exotic Beta

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Introduction

In late 2007, we published *Practical Applications of Active and Passive Investment Management: Examining Real Alpha and Exotic Beta.* The economic environment has changed dramatically since the last study. The U.S. entered a recession in December 2007 and most major equity indices have lost more than half of their value from their peaks in October 2007.

In 2008, many well-known active portfolio managers struggled and trailed their benchmarks. Some managers believe they were unfairly punished as some investors moved money out of the markets due to panic rather than a decline in investment fundamentals, resulting in large mutual fund redemptions.

Actively managed stock funds saw net cash outflows of $221.8 billion in 2008, while passively managed index funds enjoyed net cash inflows of $17.6 billion, according to data from Lipper Inc. Significantly, U.S.-based exchange traded funds (ETFs) experienced approximately $178 billion in net inflows for the same year[1]. Over 20% of total stock fund assets were allocated to passive index funds or ETFs at the end of 2008, according to the Investment Company Institute. Active managers still represent the majority of market assets, however, passive investments have been gaining market share over the past few years.

The never-ending debate between the merits of active and passive management has become even more relevant to investors today. What approach will provide investors with vital benefits from a long-term perspective? When the recovery eventually comes and the markets bounce back, which investment approach is likely to do better?

To help answer this question, we have recently updated and enhanced this study with the latest data, broader coverage, and more robust methodology. Details of the enhancements and a comparison of results from the 2007 and 2009 studies are provided in Appendix 1.

Study Overview

I. Investments Analyzed: We analyzed 30,435 U.S. domiciled non-index mutual funds in 60 categories representing almost $4 trillion of assets as of the end of 2008. The study included all live (in operation) and obsolete mutual funds in the Morningstar database. We analyzed 9,965 obsolete funds in our study and included their historical asset base and returns during their existence when calculating category composite performance. By including obsolete funds in the population when calculating category averages, the data better reflects the reality of the category's historical returns.

Obsolete funds are usually liquidated or merged with other funds. We included obsolete funds in this study to reduce survivorship bias: the tendency for mutual funds to be excluded from a database because they no longer exist. Mutual funds with poor performance tend to be dropped by mutual fund companies, generally because of poor results or low asset accumulation. This phenomenon, which is widespread in the fund industry, results in an overestimation of the past returns of mutual funds. For example, a mutual fund family's selection of funds today will include only those that have been successful in the past. Many poorly performing funds are closed and merged into other funds thereby hiding poor performance. In our study, we took this important issue into account when analyzing past performance.

If a fund offered different share classes, we treated each share class as a different fund to capture the impact of different expense ratios on portfolio returns. Returns were analyzed net of management fees and other expenses.

II. Time Period: Mutual funds were analyzed for the period of January 1, 1994 to December 31, 2008. Every fund's behavior pattern and performance was analyzed for 13 rolling 3-year trailing periods ending December 31, 2008.

[1] www.seekingalpha.com, 7 January 09

Traditionally, the 3-, 5-, 10- and 15-year trailing periods are used to evaluate investment performance. Recent performance can have a heavy impact on returns over all time periods since the 3-year returns are also captured in the 5-, 10- and 15-year trailing periods. Our methodology avoids this redundancy by treating all trailing periods equally.

III. Index Regression: Fifty-six (56) indices were regressed against each mutual fund for each time period. **These indices were used because they represented a broad range of different asset classes, market segments, and investment strategies.** We chose these particular indices for the study, because we believe these indices to have been relevant to the style categories included in the study. Other indices could have been selected and could have produced different results.

Appendix 2 provides a complete list of indices used in the study.

IV. Framework of Analysis. The study sought to identify:

- Investment categories in which active managers provided value through their unique investment management capabilities in excess of the category's index movement, known as **Real Alpha** (asset weighted)
- Investment categories that have generated excess returns through risk premiums not correlated to the broad markets, known as **Exotic Beta** (asset weighted)
- The percentage of managers in each investment category that outperformed their respective category benchmarks, which this study refers to as the **Manager Success Rate** (non-asset weighted)
- Investment categories that were found to generate positive Real Alpha in **bull markets**, **bear markets** and **both**.

Please refer to Appendix 3 for an explanation of study's investment concepts and methodology.

Results of Analysis

I. Mutual Fund Recommendations by Investment Category

Based on the results of this study, the Mutual Fund Recommendation Table on the following pages provides:

- Recommendations on whether an **active or passive bias** has been advantageous for each mutual fund category. Note that passive investments may not currently be available for all investment categories listed.

  Investment categories that did not meet the study's criteria for either an active or passive bias are labeled "neutral," and either active or passive management could be appropriate.

- **Tactical allocation recommendations (overweight, underweight, or neutral)** which can be utilized during the portfolio construction process.

- An assessment as to how many actively managed funds consistently outperformed their category benchmarks, which this study refers to as the **Manager Success Rate**. The Manager Success Rate is provided in four ranges: 0-24%, 25-49%, 50-74% and 75-100%.

Appendix 4 provides full details behind the analysis and results of the Mutual Fund Recommendation Table.

How to Read the Mutual Fund Recommendation Table

The table is a summary of suggestions. An example is provided below. For instance, the Small Blend category is read as "active," "overweight," and "between 50-74%." That is to say, first, actively managed Small Blend mutual funds generally held an advantage over passive indices in this category. Second, the Small Blend category has historically outperformed the broad equity market by adding Exotic Beta returns, thus overweighing this category in a tactical asset allocation may enhance portfolio performance against the broad markets. Finally, between 50-74% of active Small Blend mutual funds actually outperformed their benchmarks. The number of active and obsolete Small Blend funds utilized in the analysis is provided in the last two columns.

Morningstar Category	Recommended Active/Passive Bias *based on real alpha*	Tactical Allocation Recommendation *based on exotic beta*	Manager Success Rate	Number of active funds evaluated	Number of obsolete funds evaluated
Small Blend	Active	Overweight	Between 50-74%	715	157

Past performance is no guarantee of future results.

Making the Data Useful

If only one Small Blend investment was selected to represent this category in a portfolio, the table suggests that an actively managed fund might be a better candidate than a passive index fund or ETF. However, we can also utilize the data with the goal of *optimizing* the portfolio's exposure to the small blend category, using multiple investments and incorporating an active bias rather than an all-active approach. For example, an actively managed mutual fund may be selected for 60% of the portfolio's small blend allocation (based on the Manager Success Rate range) and an ETF or index mutual fund may be selected for the remaining 40% of the allocation. **Exotic beta is only one of the many factors to consider when constructing asset allocations.**

Mutual Fund Recommendation Table

Morningstar Category	Recommended Active/Passive Bias *based on real alpha*	Tactical Allocation Recommendation *based on exotic beta*	Manager Success Rate	Number of active funds evaluated	Number of obsolete funds evaluated
Bank Loan	Neutral	Overweight	Between 25-49%	132	11
Bear Market	Passive	Underweight	Between 0-24%	85	7
Conservative Allocation	Neutral	Overweight	Between 25-49%	759	139
Convertibles	Active	Overweight	Between 25-49%	125	54
Currency	Passive	Overweight	Between 25-49%	21	0
Diversified Emerging Markets	Neutral	Overweight	Between 25-49%	440	117
Diversified Pacific/Asia	Active	Underweight	Between 50-74%	85	48
Emerging Markets Bond	Active	Overweight	Between 50-74%	126	26

Source: FundQuest

Mutual Fund Recommendation Table (continued)

Morningstar Category	Recommended Active/Passive Bias *based on real alpha*	Tactical Allocation Recommendation *based on exotic beta*	Manager Success Rate	Number of active funds evaluated	Number of obsolete funds evaluated
Europe Stock	Neutral	Overweight	Between 25-49%	234	141
Foreign Large Blend	Neutral	Neutral	Between 25-49%	1057	357
Foreign Large Growth	Neutral	Overweight	Between 25-49%	376	129
Foreign Large Value	Active	Neutral	Between 50-74%	379	60
Foreign Small/Mid Growth	Active	Overweight	Between 75-100%	170	35
Foreign Small/Mid Value	Active	Overweight	Between 50-74%	100	18
Global Real Estate	Active	Underweight	Between 25-49%	160	15
High Yield Bond	Passive	Overweight	Between 0-24%	757	248
High Yield Municipal	Neutral	Neutral	Between 25-49%	122	3
Inflation-Protected Bond	Neutral	Neutral	Between 25-49%	162	20
Intermediate Government Bond	Passive	Neutral	Between 0-24%	631	302
Intermediate-Term Bond	Neutral	Neutral	Between 0-24%	1590	567
Japan Stock	Active	Underweight	Between 25-49%	90	52
Large Blend	Passive	Overweight	Between 25-49%	2688	968
Large Growth	Passive	Neutral	Between 25-49%	2646	1012
Large Value	Passive	Overweight	Between 25-49%	1870	570
Latin America Stock	Neutral	Overweight	Between 0-24%	56	36
Long Government	Neutral	Neutral	Between 0-24%	61	32
Long-Short	Neutral	Overweight	Between 25-49%	217	51
Long-Term Bond	Neutral	Underweight	Between 0-24%	106	62
Mid-Cap Blend	Neutral	Overweight	Between 25-49%	598	168
Mid-Cap Growth	Passive	Overweight	Between 25-49%	1345	504
Mid-Cap Value	Passive	Overweight	Between 25-49%	549	139
Moderate Allocation	Neutral	Overweight	Between 25-49%	1562	465
Multisector Bond	Neutral	Overweight	Between 25-49%	301	82
Muni Single State Interm	Passive	Underweight	Between 0-24%	468	239
Muni Single State Long	Passive	Underweight	Between 0-24%	553	271

Source: FundQuest

Mutual Fund Recommendation Table (continued)

Morningstar Category	Recommended Active/Passive Bias *based on real alpha*	Tactical Allocation Recommendation *based on exotic beta*	Manager Success Rate	Number of active funds evaluated	Number of obsolete funds evaluated
Muni Single State Short	Passive	Underweight	Between 0-24%	37	22
Pacific/Asia ex-Japan Stk	Active	Overweight	Between 50-74%	192	64
Short Government	Neutral	Neutral	Between 0-24%	276	148
Short-Term Bond	Neutral	Neutral	Between 0-24%	590	193
Small Blend	Active	Overweight	Between 50-74%	715	157
Small Growth	Active	Underweight	Between 50-74%	1160	405
Small Value	Neutral	Overweight	Between 25-49%	541	140
Specialty-Communications	Neutral	Neutral	Between 50-74%	78	41
Specialty-Financial	Passive	Overweight	Between 25-49%	173	60
Specialty-Health	Active	Overweight	Between 50-74%	280	124
Specialty-Natural Res	Active	Overweight	Between 50-74%	241	27
Specialty-Precious Metals	Neutral	Overweight	Between 25-49%	83	20
Specialty-Real Estate	Neutral	Overweight	Between 25-49%	308	71
Specialty-Technology	Neutral	Neutral	Between 25-49%	501	288
Specialty-Utilities	Active	Overweight	Between 50-74%	129	44
Target-Date 2000-2014	Passive	Overweight	Between 25-49%	310	18
Target-Date 2015-2029	Passive	Overweight	Between 0-24%	474	18
Target-Date 2030+	Passive	Neutral	Between 0-24%	716	18
Ultrashort Bond	Neutral	Neutral	Between 0-24%	184	72
World Allocation	Active	Overweight	Between 50-74%	268	64
World Bond	Neutral	Neutral	Between 25-49%	387	145
World Stock	Active	Underweight	Between 25-49%	940	270

Source: FundQuest **Past performance is no guarantee of future results**

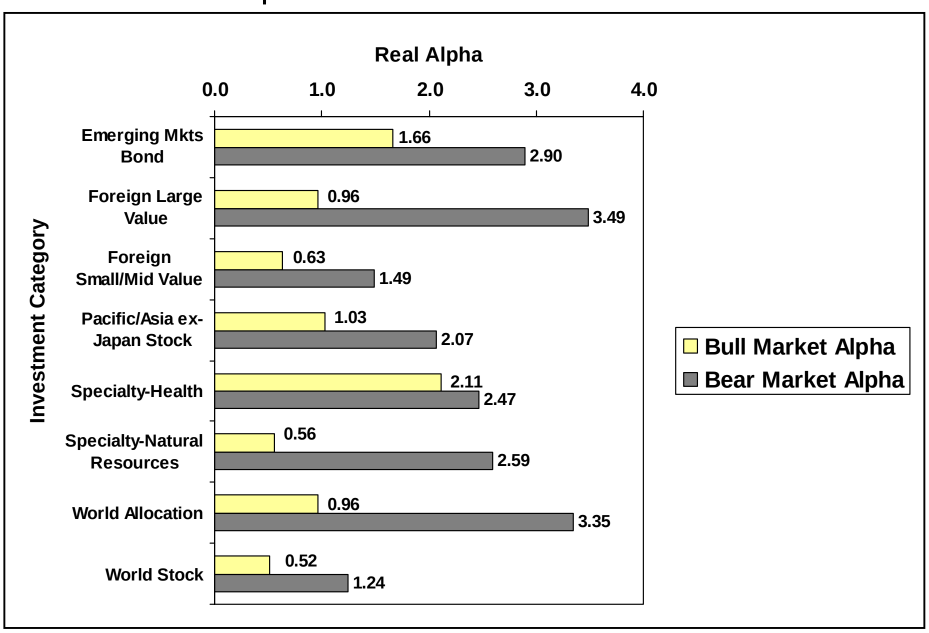
II. Evaluation of Investment Category Performance in Bull and Bear Markets

We analyzed mutual fund performance patterns in different market environments. We divided the 15-year period into two groups based on market conditions: Bull markets 1994-1999 and 2003-2007, and bear markets 2000-2002 and 2008. We calculated the asset-weighted average exotic beta and real alpha of each category for each market condition.

Generally, active managers generated more real alpha in bull markets and lower real alpha in bear markets. In aggregate bull markets, the real alpha generated by the entire universe was 0.44 higher than that in bear markets. Specifically, 38 out of 60 categories generated more real alpha in bull markets, while 24 out of 60 categories held relative strength in bear markets. We noticed that many growth categories performed better in bull markets, while some value categories generated more real alpha in bear markets. Details are provided in following chart and tables.

As shown below, eight categories generated positive real alpha (>0.5) in both bull and bear markets.

Investment Categories that Generated Positive Real Alpha in Both Bull and Bear Markets



Source: FundQuest
Past performance is no guarantee of future results

19 Categories Generated Positive Real Alpha (>0.5) in Bull Markets

Category	Bull Market Alpha
Specialty-Utilities	4.45
Foreign Small/Mid Growth	4.07
Diversified Pacific/Asia	3.22
Specialty-Precious Metals	2.29
Specialty-Health	2.11
Emerging Markets Bond	1.66
Foreign Large Blend	1.39
Small Growth	1.23
Global Real Estate	1.12
Pacific/Asia ex-Japan Stk	1.03
World Allocation	0.96
Foreign Large Value	0.96
Foreign Large Growth	0.87
Foreign Small/Mid Value	0.63
Target-Date 2000-2014	0.62
Convertibles	0.60
Specialty-Real Estate	0.60
Specialty-Natural Res	0.56
World Stock	0.52

Source: FundQuest
Past performance is no guarantee of future results

12 Categories Generated Positive Real Alpha (>0.5) in Bear Markets

Category	Bear Market Alpha
Foreign Large Value	3.49
World Allocation	3.35
Emerging Markets Bond	2.90
Specialty-Natural Res	2.59
Specialty-Health	2.49
Pacific/Asia ex-Japan Stk	2.07
Foreign Small/Mid Value	1.49
World Stock	1.24
Target-Date 2030+	0.93
Specialty-Communications	0.76
Moderate Allocation	0.75
Conservative Allocation	0.67

Source: FundQuest
Past performance is no guarantee of future results

The following table details the bull market and bear market real alpha for each investment category included in the analysis.

Bull Market and Bear Market Alpha by Investment Category

Category	Bull Market Alpha	Bear Market Alpha
Bank Loan	0.10	-3.72
Bear Market	-2.13	-5.43
Conservative Allocation	-0.21	0.67
Convertibles	0.60	-0.58
Currency	-3.33	-1.68
Diversified Emerging Mkts	-0.38	-0.06
Diversified Pacific/Asia	3.22	-1.23
Emerging Markets Bond	1.66	2.90
Europe Stock	0.03	0.48
Foreign Large Blend	1.39	0.03

Source: FundQuest

Bull Market and Bear Market Alpha by Investment Category (continued)

Category	Bull Market Alpha	Bear Market Alpha
Foreign Large Growth	0.87	-0.70
Foreign Large Value	0.96	3.49
Foreign Small/Mid Growth	4.07	-0.51
Foreign Small/Mid Value	0.63	1.49
Global Real Estate	1.12	-1.98
High Yield Bond	-0.65	-3.24
High Yield Muni	0.45	-6.07
Inflation-Protected Bond	0.20	-1.53
Intermediate Government	-0.60	-0.63
Intermediate-Term Bond	-0.12	-1.50
Japan Stock	-0.24	-6.44
Large Blend	-1.15	-0.77
Large Growth	-0.90	-1.93
Large Value	-1.17	0.02
Latin America Stock	0.14	-0.95
Long Government	-0.30	-2.13
Long-Short	0.45	-0.76
Long-Term Bond	-0.14	-1.91
Mid-Cap Blend	0.14	-1.44
Mid-Cap Growth	-0.47	-2.23
Mid-Cap Value	-1.64	-0.24
Moderate Allocation	-0.98	0.75
Multisector Bond	-0.54	0.31
Muni Single State Interm	-0.79	-0.63
Muni Single State Long	-0.75	-1.12
Muni Single State Short	-0.88	-0.53
Pacific/Asia ex-Japan Stk	1.03	2.07
Short Government	-0.42	-0.45
Short-Term Bond	-0.33	-1.22
Small Blend	0.12	0.43
Small Growth	1.23	-0.08
Small Value	-0.51	-0.61
Specialty-Communications	0.48	0.76
Specialty-Financial	-0.58	-0.89
Specialty-Health	2.11	2.49
Specialty-Natural Res	0.56	2.59
Specialty-Precious Metals	2.29	0.32
Specialty-Real Estate	0.60	-1.63
Specialty-Technology	-0.14	-0.58

Source: FundQuest

Bull Market and Bear Market Alpha by Investment Category (continued)

Category	Bull Market Alpha	Bear Market Alpha
Specialty-Utilities	4.45	-3.66
Target-Date 2000-2014	0.62	-1.29
Target-Date 2015-2029	-0.89	-1.61
Target-Date 2030+	-1.03	0.93
Ultrashort Bond	-0.12	-2.32
World Allocation	0.96	3.35
World Bond	-0.03	-0.27
World Stock	0.52	1.24

Source: FundQuest **Past performance is no guarantee of future results**

Conclusion

In this study, we again examined real alpha and exotic beta in the U.S. non-index mutual fund universe. While this 2009 study is even more robust than our 2007 study on this topic, we found that the major conclusions in our previous study still held true and results from two studies were remarkably consistent, in spite of the dramatic market downturns experienced since 2007.

Our main conclusion is that we should not paint either active or passive investments with a broad stroke. Both types of investments have their strengths and weakness. It depends on the market segments they are in: less efficient, more active. Other observations:

- Compared to the 2007 study, no categories moved from a recommended passive bias to an active one; or from a recommended active bias to a passive one. However, we did see some movements between active and neutral, or neutral and passive categories. Specifically,
  - Eight categories moved from neutral in 2007 to active in 2009.
  - Eight categories moved from active in 2007 to neutral in 2009.
  - Eight categories moved from neutral in 2007 to passive in 2009.
  - Three categories moved from passive in 2007 to neutral in 2009.
- There are managers generating positive real alpha, even in categories where active managers have historically underperformed their benchmarks. Compared to the 2007 study, we found that:
  - In nine categories, including some major equity categories, a higher percentage of active managers outperformed their benchmarks compared to before (Manager Success Rate).
  - In 10 categories, fewer active managers outperformed their benchmarks compared to before.
- Generally, active managers generated more real alpha in bull markets and less in bear markets. Nineteen (19) categories were found to have generated positive real alpha in bull markets and 12 categories generated positive alpha in bear markets. Of these, eight categories generated positive real alpha in both bull and bear markets.

- Some categories have historically provided style specific extra returns on top of the market risk premium: more exotic (less correlated to traditional investments), higher extra returns. Specifically, we recommended a tactical overweight of 32 categories and tactical underweight for 12 out of 60 categories based on exotic beta.

We don't foresee the debate between the merits of active and passive management to end anytime soon. Although passive investments have gained market share over the past few years, many see active management as more important than ever today, especially as indiscriminate selloffs have created enormous dislocations between fundamentals and valuation.

This study is designed to offer practical and actionable information, providing insight into the level of success/failure for actively versus passively managed funds in each market segment. This study can be used as a reference tool for portfolio construction and as a potential indicator for determining if either an active or passive bias, or a combination of both approaches, may be appropriate for each investment category. This study can help investors take advantage of both approaches, help them in their efforts to create optimal mixes of active and passive strategies, and ultimately may boost the efficiency of their portfolios.

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Appendix 1: Details of Enhancements to the Study and Major Changes in Results from the 2007 and 2009 Studies

Study Enhancements:

1. **Approximately 10,000 obsolete funds were added to the study to minimize survivorship bias.** The study covered 30,435 U.S. domiciled non-index mutual funds in 60 categories representing almost $4 trillion of assets as of the end of 2008. This sample included all live and obsolete U.S. non-index mutual funds in all categories in the Morningstar database. Of the 30,435 funds, 9,965 funds (or 33%) were obsolete and 20,470 (67%) funds were live.

2. **Thirteen (13) rolling 3-year trailing periods from January 1, 1994 to December 31, 2008 were analyzed to evaluate the consistency of fund performance.**

3. **Compared manager ability to generate real alpha in bull markets, bear markets and both.**

Major Changes in Results of 2007 and 2009 Studies

We found that the major conclusions in our previous study still held true. Both active and passive investments have their strengths and weakness. It depends on the category: less efficient, more active. There are managers generating positive real alpha, even in a category where active managers have historically underperformed their benchmarks. Some categories have historically provided style specific extra returns on top of the market risk premium: more exotic (less correlated to traditional investments), higher extra returns.

We found that the results from two studies were remarkably consistent, as no categories moved from passive to active; or from active to passive. However, we did see some movements between active and neutral, or neutral and passive categories.

2009 vs. 2007 Results
Active v. Passive

Recommendations by Mutual Fund Investment Category	2009 Results	2007 Results
Active -- Number of Investment Categories in which Active Mutual Funds Outperformed their benchmarks	16	15
Passive -- Number of Investment Categories in which Active Mutual Funds Underperformed their benchmarks`	18	12
Neutral -- Number of Investment Categories in which Active Mutual Funds performed in line with their benchmarks	26	31
Total	60	58

Source: FundQuest

Note that the table above includes the 2009 results for two Morningstar categories that were created since the 2007 study: Currency and Global Real Estate. We recommend incorporating a passive bias for Currency and an active bias for Global Real Estate.

Comparison of Results -- 2007 and 2009 Studies

Active Bias Recommended in both 2007 and 2009	Active Bias Recommended in 2009 (deemed Neutral in 2007)	Categories moved from Recommended Active Bias in 2007 to Neutral in 2009	Passive Bias Recommended in both 2007 and 2009	Categories moved from Neutral in 2007 to a Recommended Passive Bias in 2009	Categories moved from a Recommended Passive bias in 2007 to Neutral in 2009
Diversified Pacific/Asia	Convertibles	Bank Loan	Bear Market	Large Blend	Foreign Large Growth
Foreign Small/Mid Growth	Emerging Markets Bond	Conservative Allocation	High Yield Bond	Large Value	Long-Term Bond
Pacific/Asia ex-Japan Stk	Foreign Large Value	Diversified Emerging Mkts	Intermediate Government	Mid-Cap Value	Specialty-Technology
Small Blend	Foreign Small/Mid Value	Europe Stock	Large Growth	Muni National Long	
Specialty-Health	Japan Stock	Latin America Stock	Mid-Cap Growth	Specialty-Financial	
World Allocation	Small Growth	Small Value	Muni National Short	Target-Date 2000-2014	
World Stock	Specialty-Natural Resources	Specialty-Communications	Muni Single State Interm	Target-Date 2015-2029	
	Specialty-Utilities	Specialty-Precious Metals	Muni Single State Long	Target-Date 2030+	
			Muni Single State Short		

Source: FundQuest

1. Change in Manager Success Rate - Increases

In nine categories a higher percentage of active managers outperformed their benchmarks compared to 2007. This includes some major equity categories, such as three large cap categories, two small cap categories and two international categories.

Category	Manager Success Rate 2009	Manager Success Rate 2007
Foreign Large Blend	Between 25-49%	Between 0-24%
Foreign Large Growth	Between 25-49%	Between 0-24%
Large Blend	Between 25-49%	Between 0-24%
Large Growth	Between 25-49%	Between 0-24%
Large Value	Between 25-49%	Between 0-24%
Moderate Allocation	Between 25-49%	Between 0-24%
Small Blend	Between 50-74%	Between 25-49%
Small Growth	Between 50-74%	Between 25-49%
Specialty-Technology	Between 25-49%	Between 0-24%

Source: FundQuest

2. **Change in Manager Success Rates – Decreases**

   In 10 categories, fewer active managers outperformed their benchmarks compared to before. Most noticeably, the Diversified Emerging Markets, High Yield Municipal Bond, Latin America Stock, and Specialty-Precious Metals categories dropped two Manager Success Rate ranges or more. These categories are relatively small in the mutual fund universe and the attrition rate is high in these categories. For instance, there are only 56 funds in the Latin America Stock category and 36 of them are obsolete. Survivorship bias could have been more severe in these categories. It is not surprising that, after minimizing survivorship bias in our latest study, the Manager Success Rate range for these categories dropped significantly.

Category	Manager Success Rate 2009	Manager Success Rate 2007
Bank Loan	Between 25-49%	Between 50-74%
Diversified Emerging Mkts	Between 25-49%	Between 75-100%
High Yield Muni	Between 25-49%	Between 75-100%
Latin America Stock	Between 0-24%	Between 75-100%
Long-Short	Between 25-49%	Between 50-74%
Pacific/Asia ex-Japan Stk	Between 50-74%	Between 75-100%
Specialty-Precious Metals	Between 25-49%	Between 75-100%
Specialty-Utilities	Between 50-74%	Between 75-100%
World Allocation	Between 50-74%	Between 75-100%
World Stock	Between 25-49%	Between 50-74%

Source: FundQuest

3. **No Change in Manager Success Rates -** In 39 categories, the Manager Success Rate range remained the same.

Appendix 2: Indices Regressed Against Each Mutual Fund in Study

Citi ESBI Capped Brady	Russell 2000 Growth TR
Citi WGBI NonUSD USD	Russell 2000 TR
Credit Suisse HY	Russell 2000 Value TR
DJ Moderate Portfolio	Russell Mid Cap Growth TR
Barclays Capital Fixed Rate MBS	Russell Mid Cap Value TR
Barclays Capital Government 1-5 Yr Bd	S&P 500 TR
Barclays Capital Govt/Credit 1-5 Yr	S&P Midcap 400 TR
Barclays Capital Intermediate Treasury	MSCI AC Far East Ex Japan NR USD
Barclays Capital Municipal	MSCI AC World NR USD
Barclays Capital Municipal 10 Yr 8-12	MSCI EAFE NR USD
Barclays Capital Municipal 20 Yr 17-22	MSCI EASEA NR USD
Barclays Capital Municipal 3 Yr 2-4	MSCI EM Latin America NR USD
Barclays Capital Municipal California Exempt	MSCI EM NR USD
Barclays Capital Municipal New York Exempt	MSCI Europe NR USD
Barclays Capital US Aggregate	MSCI Japan NR USD
Barclays Capital US Credit	MSCI Pacific Ex Japan NR USD
Barclays Capital US Government	MSCI Pacific NR USD
Barclays Capital US Government Long	MSCI World Ex US NR USD
Barclays Capital US Govt/Credit 5-10 Yr	MSCI World NR USD
Barclays Capital US Govt/Credit Long	AMEX Gold Miners PR
Barclays Capital US Treasury Long	DJ US Financial
Barclays Capital US Universal	DJ US Health Care
ML Converted Bonds All Qualities	DJ US Telecommunications
USTREAS Certificate Of Deposit 6 Mon	DJ Utilities Average TR
DJ Wilshire 4500 Float Adjusted	DJ Wilshire REIT
Russell 1000 Growth TR	S&P North American Natural Resources Index
Russell 1000 TR	MSCI World/Metals&Mining USD
Russell 1000 Value TR	NYSE Arca Tech 100

Source: FundQuest

Appendix 3: Investment Concepts and Methodology

- **Real Alpha**

Real Alpha is the additional return truly stemming from the unique ability and skill set of the investment manager.

An investment category was considered to have generated positive Real Alpha if its asset-weighted Real Alpha exceeded +0.5% for the time period. If the asset-weighted average Real Alpha was below -0.5%, we consider the category to have underperformed for the time period. If the asset-weighted average Real Alpha fell between +0.5% and -0.5%, we consider the category neutral.

We recommend incorporating an active bias for investment categories deemed to have consistently generated positive Real Alpha through manager skill. Specifically, we suggest an active bias if the investment category generated positive Real Alpha over at least seven of the thirteen time periods in the study. An active bias may also be recommended if the category was in existence for less than the 15-year time period, but for which at least half of the time periods the category provided above +0.5 Real Alpha. Conversely, we recommend a passive bias for investment categories that have underperformed for at least seven of the thirteen time periods of the study.

Investment categories that fall outside of these two definitions are considered to have performed in line with their style benchmarks, and either active or passive management could be appropriate.

Real Alpha differs from Alpha (referred to here as Traditional Alpha) in that Traditional Alpha measures each investment's relative performance compared to the broad market indices such as the S&P 500, MSCI EAFE and Barclays Capital Aggregate Bond whereas Real Alpha measures each investment's relative performance compared to its best fit or category benchmark. Traditional Alpha can come from two sources: manager skill (as measured by Real Alpha) and category specific risk premium captured by managers (as measured by Exotic Beta).

- **Exotic Beta**

Exotic Beta is used to identify investment categories that may generate extra returns through risk premiums not directly correlated to the broad markets.

In terms of Exotic Beta, a category was considered to have consistently provided a specific risk premium on top of broad market returns if its asset-weighted average Exotic Beta was above +0.5% for at least seven of the thirteen time periods of the study. We recommend an overweighting of these categories that have historically obtained above market returns.

Similarly, if the asset-weighted average Exotic Beta was below -0.5% for at least seven of the thirteen time periods of the study we consider the category to have generated fewer premiums than broad market returns. We recommend an underweighting of these categories that have not historically provided above market returns.

Investment categories that fall outside of these two definitions are considered neutral.

Risk premiums vary by investment category. For example, mutual funds in an international bond category may provide a specific risk premium derived from a lack of liquidity, political instability or currency changes.

Exotic Beta is an important source of return which also provides the benefit of diversification. Measuring each investment category's Exotic Beta can help optimize a portfolio's tactical asset allocation.

- **Manager Success Rate.** Percentage of actively managed mutual funds within each category that outperformed their respective category benchmarks.

  This non-asset weighted analysis examined the number of mutual funds that outperformed their benchmarks considering the 13 time periods noted previously. In some instances the results differed from the asset weighted analysis as the size of the fund was not a factor in the results. This helps differentiate how many funds outperformed versus how much of an investment category's assets outperformed the category benchmark.

Definitions and Concepts Used in Analysis

Alpha is a portfolio measure of the difference between actual returns and expected performance, given a level of risk as measured by beta.

Portfolio return = alpha + beta * (market risk component)

In other words, Alpha is the excess return, on a risk-adjusted basis that active fund managers generate over and above their benchmark. The volatility of the residual returns is its active risk. A positive alpha figure indicates better performance than beta would predict. In contrast, a negative alpha indicates underperformance, given the expectations established by the beta. It is generally believed that positive alpha is easier to find in less efficient markets, while capturing alpha is very difficult in larger and more liquid asset classes.

Alpha can be used to directly measure the value added or subtracted by a manager. Alpha depends on two factors: 1) the assumption that market risk, as measured by beta, is the only risk measure necessary, and 2) the strength of the linear relationship between the portfolio and the benchmark, as it has been measured by R-squared. In addition, a negative alpha can sometimes result from the expenses that are present in the returns of a manager, but not in the returns of the comparison index.

Beta measures the sensitivity of a portfolio relative to the market; a portfolio with a beta of 1 will exactly track the market.

The concept of Exotic Beta was first introduced into the hedge fund world. Exotic beta refers to a premium associated with a particular asset class exposure. Some studies suggest that hedge fund returns are composed of three portions: traditional beta, exotic beta, and real alpha.

Portfolio return = real alpha + exotic beta * (particular asset class risk component) + traditional beta * (market risk component)

Traditional beta refers to the return derived from exposure to traditional stock or bond markets, while exotic beta refers to the return derived from exposure to other systematic risk factors (such as credit risk, liquidity risk, volatility risk) common to each family of hedge fund strategies.

Real alpha is the additional return truly stemming from the unique ability and skill set of the hedge fund manager. It is the active alpha that can be ported onto completely unrelated betas. Real alpha measures the manager skill.

Traditional alpha is the combination of real alpha and exotic beta. Roger Ibbotson and Peng Chen's study "The A,B,Cs of Hedge Funds" (2006) suggests that, during the time period from January 1995 through April 2006, on average, hedge funds have generated an alpha of 3.04% and returns from the betas of 5.94%. The 3.04% alpha measured here is traditional alpha, which includes the returns from exotic betas.

Recent academic analysis suggests that only a small fraction of hedge fund returns are actually accounted for by real alpha. The main sources of returns are the risk premium derived from exotic betas. Real alpha is hard to find and expensive to access, while exotic beta is relatively easy and cheap to get.

In this study, we applied the concepts of real alpha and exotic beta to the mutual fund world. We calculated the best fit alpha and traditional alpha of funds in each asset category. We believe the best fit alpha represents the real alpha, and the difference between the best fit alpha and traditional alpha reflects the return derived from the exotic beta embedded within each asset category.

Exotic beta is an important source of return, as well as providing the benefit of diversification. Measuring each asset category's exotic beta can help optimize a portfolio's tactical asset allocation.

Mathematically, **Alpha** is a regression coefficient. In calculating, we deducted the return of the 3-month T-bill from the total return of both the portfolio and benchmark. Thus, the alpha figures shown here may be lower than those published elsewhere. We believe that this calculation represents the fact that every investor has choices about where to place their money.

Let,

$R_{i,t}$ be the return of a portfolio in month t

$R_{rf,t}$ be the risk-free return (or defined by user) in month t

$R_{bm,t}$ be the return of a benchmark index in month t

$\overline{R}_i$ be the simple (monthly) mean return of a portfolio

$\overline{R}_{rf}$ be the simple (monthly) risk-free mean return

$\overline{R}_{bm}$ be the simple (monthly) benchmark index mean return

T be the number of time months

Suppose that,

$$R_i = \alpha + \beta R_{bm} + \varepsilon$$

Then, Jensen's Alpha can be calculated by,

$$JensenAlpha_M = \overline{R}_i - \overline{R}_{rf} - \beta\left(\overline{R}_{bm} - \overline{R}_{rf}\right)$$

Annualized Jensen's Alpha can be calculated by,

$$JensenAlpha_A = \left(1 + JensenAlpha_M\right)^{12} - 1$$

Traditional alpha was calculated by Morningstar for each portfolio, using a standard set of benchmarks for each asset group. In the United States, Morningstar uses the following benchmarks for alpha statistics: S&P 500 Index for U.S. stock portfolios, MSCI EAFE for international stock portfolios, Barclays Capital Aggregate Bond for taxable bond portfolios, and Barclays Capital Municipal for municipal bond portfolios.

Best fit alphas are calculated using the market index that shows the highest correlation (r-squared) between a portfolio and an index over each time period based on the best fit r-squared. The indices that were regressed against portfolios in calculations are shown in Appendix 2.

Next, we calculated the **exotic beta**.

Since,

Portfolio return = traditional alpha + traditional beta * (broad market index risk component);

Portfolio return = best fit alpha + best fit beta * (best fit index risk component);

And,
Portfolio return = best fit alpha + exotic beta * (particular asset class risk component) + traditional beta * (broad market risk component)

Then,
Return from exotic beta
= exotic beta * (particular asset class risk component)
= best fit beta * (best fit index risk component) - traditional beta * (broad market index risk component)
= traditional alpha - best fit alpha

Therefore, return from exotic beta is the difference between traditional alpha and best fit alpha.

Definition of above mentioned four indices:

<u>The S&P 500 Index</u> is a market capitalization-weighted index of 500 widely held stocks often used as a proxy for the stock market. It measures the movement of the largest issues. Standard and Poor's chooses the member companies for the 500 based on market size, liquidity and industry group representation. Included are the stocks of industrial, financial, utility, and transportation companies. Since mid 1989, this composition has been more flexible and the number of issues in each sector has varied.

<u>The MSCI EAFE Index</u> (Europe, Australasia, Far East) is a free float-adjusted market capitalization index that is designed to measure developed market equity performance, excluding the US & Canada. As of April 2002 the MSCI EAFE Index consisted of the following 21 developed market country indices: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland and the United Kingdom.

<u>The Barclays Capital Aggregate Bond Index</u> is composed of the Lehman Brothers Government/Credit Index, the Mortgage-Backed Securities Index, and the Asset-Backed Securities Index. The index includes treasury securities, government agency bonds, mortgage-backed bonds, corporate bonds, and a small amount of foreign bonds traded in U.S.

<u>The Barclays Capital Municipal Bond Index</u> is an unmanaged index considered to be generally representative of investment-grade municipal issues having remaining maturities greater than 1 year and a national scope.

You cannot invest directly in an index.

Appendix 4: Detailed Results

1. Recommended Active Categories. We recommended utilizing an active bias in 16 out of 60 categories based on real alpha. The following table is sorted descending by the second column.

Morningstar Category	Average Real Alpha over 13 Periods	Number of Periods Generating Above +0.5 Real Alpha	Number of Periods Generating Below -0.5 Real Alpha	Active vs. Passive Bias Recommendation *based on real Alpha*
Foreign Small/Mid Growth	3.60	9	1	Active
Specialty-Health	2.69	13	0	Active
Foreign Large Value	2.50	12	0	Active
World Allocation	2.33	10	0	Active
Diversified Pacific/Asia	2.30	10	3	Active
Specialty-Natural Resources	2.19	8	2	Active
Emerging Markets Bond	1.60	10	3	Active
Specialty-Utilities	1.60	8	3	Active
Pacific/Asia ex-Japan Stock	1.43	8	1	Active
World Stock	1.28	9	0	Active
Small Growth	1.21	7	3	Active
Foreign Small/Mid Value	1.16	9	1	Active
Japan Stock	0.69	7	6	Active
Small Blend	0.44	7	5	Active
Global Real Estate	0.41	5	4	Active
Convertibles	0.01	7	4	Active

Source: FundQuest

2. Recommended Passive Categories. We recommended utilizing a passive bias in 18 out of 60 categories based on real alpha. The following table is sorted ascending by the second column.

Morningstar Category	Average Real Alpha over 13 Periods	Number of Periods Generating Above +0.5 Real Alpha	Number of Periods Generating Below -0.5 Real Alpha	Active vs. Passive Bias Recommendation based on Real Alpha
Bear Market	-3.68	0	10	Passive
Currency	-2.49	5	8	Passive
High Yield Bond	-1.71	0	11	Passive
Target-Date 2015-2029	-1.27	2	9	Passive
Specialty-Financial	-1.01	2	7	Passive
Large Growth	-1.00	3	9	Passive
Mid-Cap Value	-0.93	4	9	Passive
Large Blend	-0.90	0	10	Passive
Municipal National Long	-0.85	0	10	Passive
Muni Single State Long	-0.84	0	12	Passive
Mid-Cap Growth	-0.81	3	7	Passive
Muni Single State Interm	-0.73	0	11	Passive
Muni Single State Short	-0.73	0	12	Passive
Large Value	-0.67	2	7	Passive
Intermediate Government	-0.62	0	8	Passive
Muni National Short	-0.62	0	10	Passive
Target-Date 2030+	-0.24	3	7	Passive
Target-Date 2000-2014	-0.03	4	7	Passive

Source: FundQuest

3. Recommended Overweight Categories. We recommended an overweight position in 32 out of 60 categories based on exotic beta. The following table is sorted descending by the second column.

Morningstar Category	Average Exotic Beta over 13 Periods	Number of Periods Generating Above +0.5 Exotic Beta	Number of Periods Generating Below -0.5 Exotic Beta	Tactical Allocation Recommendation based on Exotic Beta
Latin America Stock	6.60	9	4	Overweight
Specialty-Real Estate	5.95	9	4	Overweight
Emerging Markets Bond	4.47	11	2	Overweight
Specialty-Natural Resources	3.90	8	5	Overweight
Europe Stock	3.04	11	2	Overweight
Foreign Small/Mid Value	2.98	11	1	Overweight
Mid-Cap Value	2.93	9	4	Overweight
Small Value	2.44	8	5	Overweight
High Yield Bond	2.34	8	4	Overweight
Conservative Allocation	2.10	10	3	Overweight
Currency	1.96	7	4	Overweight
Diversified Emerging Markets	1.86	8	5	Overweight
Mid-Cap Blend	1.77	7	5	Overweight
Specialty-Financial	1.54	9	4	Overweight
Target-Date 2015-2029	1.53	8	3	Overweight
Small Blend	1.37	7	6	Overweight
Specialty-Utilities	1.31	7	6	Overweight
Large Value	1.25	8	4	Overweight
Long-Short	1.06	7	0	Overweight
Foreign Small/Mid Growth	1.00	8	2	Overweight
Convertibles	0.92	7	5	Overweight
Multisector Bond	0.81	8	4	Overweight
Foreign Large Growth	0.78	8	1	Overweight
World Allocation	0.77	8	4	Overweight
Moderate Allocation	0.55	9	4	Overweight
Specialty-Precious Metals	0.51	7	6	Overweight
Bank Loan	0.49	8	4	Overweight
Large Blend	0.33	8	2	Overweight

Source: FundQuest

Recommended Overweight Categories (continued)

Morningstar Category	Average Exotic Beta over 13 Periods	Number of Periods Generating Above +0.5 Exotic Beta	Number of Periods Generating Below -0.5 Exotic Beta	Tactical Allocation Recommendation based on Exotic Beta
Pacific/Asia ex-Japan Stk	0.33	7	6	Overweight
Specialty-Health	0.27	7	5	Overweight
Mid-Cap Growth	0.02	8	5	Overweight
Target-Date 2000-2014	-0.21	8	5	Overweight

Source: FundQuest

4. **Recommended Underweight Categories**. We recommended an underweight position in 12 out of 60 categories based on exotic beta. The following table is sorted ascending by the second column.

Morningstar Category	Average Exotic Beta over 13 Periods	Number of Periods Generating Above +0.5 Exotic Beta	Number of Periods Generating Below -0.5 Exotic Beta	Tactical Allocation Recommendation based on Exotic Beta
Japan Stock	-4.62	2	10	Underweight
Diversified Pacific/Asia	-4.31	4	9	Underweight
Small Growth	-1.92	5	7	Underweight
Municipal National Interm	-1.68	1	9	Underweight
Bear Market	-1.37	4	7	Underweight
Long-Term Bond	-0.87	2	8	Underweight
Muni National Long	-0.44	3	7	Underweight
Muni Single State Interm	-0.44	3	7	Underweight
Muni Single State Short	-0.43	0	7	Underweight
Muni Single State Long	-0.37	3	7	Underweight
World Stock	1.34	6	7	Underweight
Global Real Estate	3.54	6	7	Underweight

Source: FundQuest

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Note: FundQuest has built a family of funds, and a mutual fund portfolio program based on these research findings.

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