

Do enhanced index funds live up to their name?

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Abstract

Uninformed investors would expect enhanced index funds (EIFs) to live up to their name and enhance portfolio performance. This updated and thorough comparison of EIFs and pure index funds finds that EIFs, as a whole and in domestic stock fund categories, appear to have performed *worse* than their pure index funds counterpart with lower returns, higher risks and lower risk-adjusted returns. EIFs behaved more like actively managed funds, with higher expense ratios and turnover rates. Investors should be wary of sales pitches hyping the value of EIFs!

JEL classification: G29

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1. Introduction

Index investing, a strategy that attempts to approximate the performance of a broad market index, has grown significantly in recent years as investors have become less satisfied with the performance of actively managed alternatives (Baer and Gensler, 2002; Ferri, 2007; Haslem, 2003; Swedroe, 2004). In 2007, index investing funds comprised a 17% total market share of equity fund assets (10% market share by index mutual funds and 7% market share by the exchange-traded funds) (Bogle, 2007). Despite the market downturn in 2008, \$34 billion was added to index fund positions that year, taking the total invested to \$604 billion. Thirty percent of U.S. households holding mutual funds had invested in at least one index fund (Investment Company Institute, 2010).

A special group of quasi-index funds, including enhanced, leveraged, and inverse index

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funds, have evolved as a synthesis between pure index mutual funds and actively managed mutual funds (Ferri, 2007, pp. 159–160). Enhanced index funds (EIFs) are mutual funds that make adjustments to indexed portfolios in an effort to increase returns relative to the benchmark market index. According to Morningstar (2009), “Like index funds, enhanced index funds attempt to match an index’s performance. Unlike an index fund, however, enhanced index funds attempt to better the index by either adding value or reducing volatility through selective stock-picking.”

The purpose of this study is to find out if EIFs were able to enhance their performance over comparative pure index funds (PIFs). The authors first distinguish enhanced indexing from pure indexing, next review the literature on performance studies of EIFs, and then compare the operating characteristics and performance of EIFs and PIFs. Operating characteristics include expense ratios, annual turnover rates, and tax cost ratios. Performance measures include average annual returns and return percentile rank in category, risks (measured by standard deviations and betas) and risk-adjusted returns (measured by the Sharpe ratios and alphas). This study examines all available and comparable EIFs and PIFs in the United States during the 15-year period from April, 1994, to March, 2009. For study purposes and meaningful examinations, we compare only EIFs and PIFs with matching category/best fit index and time period.

2. Enhanced indexing

Where does enhanced indexing belong? Active portfolio managers seek to outperform the market using strategies defined in the prospectus. Managers of an index fund attempt to match a specified index. If enhanced indexing is to outperform the market, it must involve some active management techniques. If it is to closely track the targeted index, it must share with indexing certain techniques designed to control risk. “Risk-controlled active management” may be a more appropriate phrase, but enhanced indexing may better reflect marketing imperatives more than any desire for linguistic precision. If enhanced indexing delivers consistent excess returns with close tracking and few disappointments, investors may well prefer it to traditional forms of indexing or active management.

Two factors distinguish enhanced indexing from pure indexing. The first factor consists of the degree of active management and portfolio turnover. PIFs are passively managed portfolios, in which trades are made only when necessary to rebalance the portfolio and to realign the portfolio’s risk and return characteristics with those of the index. EIFs are actively managed portfolios in which trades are intended to rebalance the portfolio and to capture any available investment opportunities. Therefore, EIFs typically have higher turnover rates than PIFs. The second factor consists of the direction and magnitude of realized tracking error. PIFs are managed with the objective of minimizing realized tracking error, while EIFs are managed with the objective of maximizing positive realized tracking error.

How enhanced indexing accomplishes its objective varies across a spectrum of techniques. Loftus (2000), McKee (1998), Schoenfeld and Yang (2004), as well as Steinberg and Madigan (1999) discuss the major methods of enhanced equity indexing. With security-based methods, fund managers may underweight or eliminate stocks they think are overval-

ued and increase the weight of stocks they think are undervalued. Other security-based methods focus on equally weighted portfolios. Using this approach, portfolio managers place the same amount of money in each stock in the fund rather than allocating by its value in the index. With synthetic methods, funds create an index fund using derivatives such as futures, options, and equity swaps in an attempt to capture small anomalies in stock or bond market pricing and beat the market by a small margin.

3. Literature review

3.1. Index funds

Michael Jensen's (1968) classic study of mutual fund performance found that the average mutual funds produced disappointing returns. Throughout the remainder of the 20th century and into the current epoch the value of active mutual fund management continues to be hotly debated. In their comprehensive analysis of active versus passive management across investment categories over time, Fortin and Michelson (2002) found significant advantages to indexing. Only in the small company equity market and international stock market were mutual fund managers able to seek out inefficiencies and outperform the benchmark index. In all other instances, the index return was significantly greater than the average fund return. Using a technique that controls for situations where mutual funds ended up with significant alphas by luck alone, Barras, Scaillet, and Wermers (2010) find that virtually no funds exhibit persistent positive performance. Furthermore, the very small proportion of funds that beat market index, has shrunk over time.

Similar findings have been found by those studying special segments of the mutual fund market. For instance, Hartzell, Muhlhofer, and Titman (2010) find that 6.1% of real estate investment trust beat the market. When using a multi-index benchmark for risk adjustment the number of REITs providing excess return drops to only 0.7%. Similar results were observed by Chen, Ferson, and Peters (2010), who studied 1,400 bond funds over a 45 year period ending in 2007. Their research shows that bond fund manager timing is poor and that actively managed bond funds turn in significantly negative returns on an after cost basis.

3.2. Enhanced index funds

There have been several studies of EIFs. Tower and Yang (2008) compare Vanguard, the largest provider of index funds, and DFA, one of the largest providers of EIFs. The focus of their study is whether the higher returns of DFA funds are sufficient to offset higher brokerage fees, because although Vanguard funds can be bought directly, DFA funds can only be bought through an advisor who charges for the service. Over the 1999–2006 period, Tower and Yang find the DFA EIFs that mimic Vanguard's mutual funds have a geometric mean that is 2.57% greater. However, DFA EIFs trail the Vanguard benchmark in several years, and using Modigliani and Modigliani's (1997) technique for adjusting for risk, the difference drops to 0.1%.

Of course, Vanguard itself has both index and managed funds, so a reasonable question

is one of whether Vanguard's managed funds beat their index funds. Rodriguez and Tower (2008) help answer this question based on a comparison of each Vanguard managed fund to a "tracking basket" of Vanguard's index funds. Over the four-year, 2003–2006 period, they find that managed funds that are closely tracked by their tracking baskets have been beaten by the index fund. Those that are loosely based on the index, allowing more enhancement options, have beaten the index. Unfortunately, for investors, they do not find any persistent ability of managed funds to beat the market from period to period.

One might wonder why EIFs would beat PIFs. In their study of investment strategies adopted by index and EIFs, Frino, Gallagher, and Oetomo (2005) find that passive funds are more likely to overweight stocks with higher liquidity, larger market capitalization, and higher past performance (or price momentum) as they attempt to mimic the returns and risk of the underlying benchmark. Consistent with Jegadeesh and Titman (2001, 2002), their findings indicate that EIF managers are reliant on momentum trading. Studying 34,638 institutional trades during the 1999–2001 period, Frino, Gallagher, and Oetomo also find that EIFs exhibit a higher propensity to hold 'winner' stocks and to liquidate 'loser' securities. Their study of over 75% of Australian index funds, based on over 19,000 index fund trades and 14,000 EIF trades, finds that EIFs earn an excess monthly return of eight basis points.

Continuing the consideration of investment in international equity markets, active portfolio managers may be better able to piece together the sparse information and effectively evaluate the quality of management, corporate governance structures, future growth prospects, and so forth. The success of international actively managed fund observed by Fortin and Michelson (2002), which was mentioned earlier, suggests that this is one of the few equity categories where active management might benefit from less efficient markets. In a recent study, Malkiel (2010) compares the investment returns earned by 414 global equity managers to the MSCI World Index, and finds that well over half of the active managers failed to outperform the passive benchmark. Even in emerging markets, many of which are far less efficient than markets in developed countries, passive management appears to be a winning strategy. Malkiel also finds about two-thirds of the active managers of emerging-market funds were beaten by the index. He concludes that the very inefficiency of the trading in many emerging markets, with relatively large bid-ask spreads and a variety of transaction costs, makes it difficult for active managers to outperform a passive benchmark.

A wide variety of research in bond mutual funds tends to draw similar findings. As in the case for stock funds, few managers of actively managed bond funds have consistently outperformed specific benchmark indices (Thau, 2001, p. 331). However, Du, Huang, and Blanchfield (2009) examined the performance persistence of high-quality corporate bond mutual funds and found both evidence for the short-term persistence of abnormal returns and that the abnormal returns may at least partly be due to bond fund manager skills.

In their classic study using linear and nonlinear models, Blake, Elton, and Gruber (1993) examined two samples of bond funds—one sample designed to eliminate survivorship bias and a second much larger sample. Overall and for subcategories of bond funds, they find that bond funds underperform relevant indexes post expenses. They find that, on average, a percentage-point increase in expenses leads to a percentage-point decrease in performance. These authors' results are robust across a wide choice of models. The nonlinear model

weights closely match actual composition weights. The authors find no evidence of predictability using past performance to predict future performance for their unbiased sample.

Similar results have been found in international bond markets. Detzler (1999), for instance, studied the risk and return characteristics of international bond mutual funds from 1988 to 1995. Actively managed funds did not demonstrate superior performance, net of expenses, against a wide range of benchmarks, with fund expenses being negatively related to performance. International bond funds in her study did not outperform a U.S. bond index, suggesting that U.S. investors did not gain diversification benefits using international bond funds.

3.3. Are EIFs worthy of investors' money?

Mutual fund firms who manufacture and sell the funds claim that these funds are index funds that can be used to enhance returns (e.g., Neal, 1999). DiBartolomeo (2000) argues that investing in EIFs is a better alternative to investing in a combination of index and actively managed funds. In his view, compared with combination strategies, EIFs reduce transaction costs and avoid capitalization biases, while better utilizing manager forecasting skills.

Many other observers, including index purists and academics (e.g., Gutner, 1999; Haslem, 2003; McDowell, 1999; Polyak, 2000; Scott and Stumpp, 2003; Swedroe, 2004), assert that these funds are actively managed funds and do not belong in any index fund portfolio. These safe-sounding funds attempt to provide returns higher than a specified index, but not without assuming more risk. Zweig (1999) discusses three types of EIFs, but concludes that they provide “a jumble of erratic performance, higher risks, higher taxes and higher expenses.” Only two of eight large-blend EIFs exhibiting characteristics reasonably consistent with the S&P 500 Index provide enhanced returns in Riepe and Werner's (1998) study. Barbee (1998) examines EIFs and concludes that they are “hardly a no-lose proposition.” Jorion (2003) warns that EIFs may result in seriously inefficient portfolios since funds managers pay no attention to total portfolio risk. Ahmed and Nanda (2005) find that EIFs do not outperform their benchmarks. This research updates the prior studies and examines domestic stock, international stock, fixed-income, and alternative mutual funds.

Many financial websites have examined EIFs. Ryan Barnes (2007), an institutional investor at Merrill Lynch and Morgan Stanley and author of investment newsletter *Epiphany Investing*, provides an array of EIF construction techniques, evaluates expense ratios, and makes suggestions regarding EIF investment, but warns investors that as of 2007 “enhanced index funds do not have sufficient performance histories to determine whether they can really deliver.” Rob Wherry (2007), *Mutual Funds* section writer for the Wall Street Journal, describes the EIF use of equal company weighting and derivative securities to beat capitalization-based indexes. However, he urges readers to take a “wait-and-see” approach, waiting to see if EIF returns are sufficient to cover expense ratios. Murray Coleman (2009), writer for Yahoo! Finance's *IndexUniverse* column, reports that in the market collapse of 2008 many EIFs outperformed the index rivals, but warns readers that a single year is an insufficient time period to judge any investment technique. The research presented here evaluates EIF performance over as many as 15 years.

4. Data and methodology

All EIFs and PIFs in the United States with at least three years of data available on March 31, 2009, were collected from Morningstar's Principia. For study purposes and meaningful examinations, only EIFs and PIFs with matched periods (three, five, 10, and 15 years) and Morningstar categories/best fit indexes (shaded cells in Table 1) were chosen and their average measures compared for each Morningstar category/best fit index combination. Table 1 shows the breakdown of data used: 178 EIFs and 444 PIFs in 20 category/index combinations of domestic stock funds, three categories/indexes of international stock funds, two categories/indexes of fixed-income funds, and six categories/indexes of alternative funds. Seventy-five percent of the EIFs are domestic stock funds, while an ever larger 84% of the PIFs are domestic stock funds. By reviewing Table 1, one can easily see that most of the funds with 10 and 15 years of data invest in domestic stocks.

This paper empirically compares operating characteristics and performance measures of EIFs and PIFs in the U.S. investment industry. Operating characteristics collected, averaged, and reported include expense ratios, annual turnover rates, and tax cost ratios.

The expense ratio is the annual fee all mutual funds charge investors. Expense ratios are expressed as the percentage of assets deducted each fiscal year for fund expenses, including 12b-1 fees, management fees, administrative fees, operating costs, and all other asset-based costs incurred by the fund.

The turnover rate or ratio is a measure of the fund's trading activity. Turnover ratios are computed taking the lesser of purchases or sales (excluding all securities with maturities of less than one year) and dividing by average monthly net assets. A turnover ratio of 100% does not necessarily suggest all securities in the portfolio have been traded. The fund might have held 50% of all positions for the past five years and turned over the other 50% of all positions twice throughout the year. A low turnover rate would loosely indicate a buy-and-hold strategy. High turnover would indicate an investment strategy involving considerable buying and selling of securities. The turnover figure is culled directly from the financial highlights of the fund's annual report and is not calculated by Morningstar.

Morningstar's tax cost ratio measures how much a fund's annualized return is reduced by the taxes investors pay on distributions. Funds regularly distribute dividends and capital gains to their investors. Investors then must pay taxes on those distributions during the year they are received. Like an expense ratio, the tax cost ratio is usually concentrated in the range between 0% and 5%. A 0% tax cost ratio indicates the fund had no taxable distributions. A higher tax cost ratio indicates the fund was less tax efficient.

Performance measures include conventional return, risk, and risk-adjusted return measures as suggested by Bodie, Kane and Marcus (2007). Annual average returns are measured using changes in a mutual funds' net asset value (NAV). Return percentile rank in category represents the percentile rank of the fund's return in its Morningstar category over the designated time frame. Returns are ranked from highest to lowest, with the best return having a 1% (i.e., top percentile) ranking and the worst a 100% ranking. These relative figures are a good way to locate funds that outperformed or underperformed their peers during a certain time period.

Standard deviation (a statistical measurement of dispersion around an average) depicts

Table 1 Numbers of available index funds (with at least three-year data)*

Morningstar category	Best fit index	Enhanced index funds				Pure index funds			
		With 3-Year Data	With 5-Year Data	With 10-Year Data	With 15-Year Data	With 3-Year Data	With 5-Year Data	With 10-Year Data	With 15-Year Data
Domestic stock funds									
Financial	DJ Financial	8	8			1	1		
Health	DJ Healthcare	10	10			2	2		
Large blend	Mstar US Mkt TR	3	1	1		24	24	12	3
Large blend	Russ 1000	26	20	14	9	8	8	5	2
Large blend	S&P 500	21	21	18	4	179	178	141	86
Large growth	Mstar Large Growth	3	3			6	6	2	
Large growth	NYSE Tech 100	4	4	4	4	6	6		
Large growth	Russ 1000 Growth	13	13	8		11	11	3	3
Large value	Mstar Large Cap TR	3	3			2	2		
Large value	Russ 1000 Value	5	5			11	11	4	3
Mid-cap blend	Mstar Mid Cap TR	1	1	1		11	11	8	
Mid-cap blend	S&P Midcap 400	12	12	12		40	38	8	8
Mid-cap growth	S&P Midcap 400	3	3			2	2		
Miscellaneous sector	Mstar Cons Good TR	2	2			1	1		
Miscellaneous sector	Mstar Cons Srvs TR	2	2			1	1		
Natural res	Mstar Energy TR	2	2			1			
Real estate	DJ Wilshire REIT T	2	2			7	7	7	
Small blend	Mstar Small Cap TR	1	1	1	1	5	5	5	5
Small blend	Russ 2000	10	9	9		55	54	23	6
Utilities	DJ Utility	2	2			1	1	1	1
International stock funds									
Diversified emerging mkts	MSCI Em ND	1				2	2	2	
Foreign large blend	MSCI EAFE Ndr_D	8				39	38	20	6
Foreign large blend	MSCI Wd x USN	3	1	1		12	8	4	4
Fixed-income funds									
Intermediate-term bond	Barcap US Univ Bon	6	6			1	1	1	1
Long government	Barcap LT Treasury	4	4	4	4	2			
Alternative funds									
Bear-market	Barcap LT Treasury	3	2			2			
Bear-market	DJ Wilshire REIT T	1				2			
Bear-market	Mstar Hardware TR	5	5	2		2	2		
Bear-market	Russ 2000	3	3			2	2		
Bear-market	S&P 500	5	5	2		2	2	2	
Currency	AMEX Gold Miners	6				4			
	Total	178	150	77	22	444	424	248	128

*As of March 31, 2009 from Morningstar's Principia.

Funds in shaded cells are both index- and time period-matched, and are used for comparisons.

how widely a fund's returns varied over a certain period of time. Investors use the standard deviation of historical performance to predict the range of returns most likely for a given fund. When a fund has a high standard deviation, the predicted range of performance is wide, implying greater volatility. Morningstar computes the standard deviation by using the trailing monthly total returns for the appropriate time period. All monthly standard deviations are

then annualized. Standard deviation is a component in the Sharpe ratio, a risk-adjusted return measure developed by Nobel Laureate William Sharpe. The Sharpe ratio is calculated by using both the standard deviation and excess return to determine reward per unit of risk. Funds with higher Sharpe ratio had better historical risk-adjusted return performance. The Sharpe ratio over a three-year period is calculated for the past 36-month period dividing a fund's annualized excess returns over the risk-free rate by its annualized standard deviation. Standard deviation is recalculated by Morningstar on a monthly basis.

Two statistics from modern portfolio theory are also used to shed some light on funds' market risks and market-risk-adjusted returns. While standard deviation is a measure of a fund's absolute volatility, beta is a measure of a fund's sensitivity to market movements. Morningstar calculates beta by comparing a fund's excess return over Treasury bills to the market's excess return over Treasury bills. Consequently, a beta of 1.10 means that the fund has typically performed 10% better than its benchmark index in up markets and 10% worse in down markets, assuming all other factors remain constant. A low beta signifies only that the fund's market-related risk is low; it could still have a high standard deviation. Beta is particularly appropriate when used to measure the risk of a combined portfolio of mutual funds. Alpha is a measure of the difference between a fund's actual returns and its expected performance, given its level of risk as measured by beta. A positive alpha figure indicates the fund has performed better than its beta would predict. For example, an alpha of 0.86 indicates that the fund produced a return 0.86% higher than its beta would predict. In contrast, a negative alpha indicates the fund has underperformed expectations established by the fund's beta and the capital asset pricing model (CAPM).

5. Results

5.1. *Mutual fund operating characteristics*

Expense ratios, annual turnover rates and three-year tax cost ratios are summarized in Table 2. EIF values are listed in the first column for each operating characteristic and averaged at the bottom of the table. EIFs, as a whole, appear to have higher expense ratios (1.84% vs. 1.11%) than PIFs, though the difference is only statistically significant for domestic stock funds (1.81% vs. 0.93%).

As shown in Table 2, EIFs have higher expense ratios in 16 of the 20 Morningstar category/best fit index combinations of domestic stock funds than PIFs. The four exceptions where EIFs have lower expense ratios are sector funds in health (with 1 index), large value funds (2 of 2 indexes), and midcap growth funds (with 1 index).

EIFs show higher turnover rates (427.54% vs. 185.43%), as a whole, than PIFs, though results are statistically significant for only domestic stock funds (333.82% vs. 138.51%). EIFs display higher turnover rates in 16 of the 20 categories/indexes of domestic stock funds than PIFs. The four exceptions where lower turnover rates exist for PIFs are large growth funds (2 of 3 indexes), large value funds (1 of 2 indexes), and midcap growth funds (the only index in this category). International stock EIFs have a turnover rate that is, on average, over

Table 2 Mutual fund operating characteristics: expense ratio (%), annual turnover (%), and three-year tax cost ratio (%)

Morningstar category	Best fit index	Expense ratio		Annual turnover		Tax cost ratio	
		EIFs	PIFs	EIFs	PIFs	EIFs	PIFs
Domestic stock funds							
Financial	DJ Financial	2.31	0.28	502.75	20.00	0.66	0.51
Health	DJ Healthcare	2.19	2.89	337.20	4.50	0.40	1.16
Large blend	Mstar US Mkt TR	0.82	0.35	58.67	16.54	1.19	0.58
Large blend	Russ 1000	1.55	0.19	171.42	7.38	1.91	0.54
Large blend	S&P 500	1.30	0.70	129.86	21.26	0.79	0.76
Large growth	Mstar Large Growth	1.99	1.63	50.00	364.33	0.00	0.09
Large growth	NYSE Tech 100	1.72	1.11	57.00	25.17	0.00	0.12
Large growth	Russ 1000 Growth	1.36	0.99	125.46	224.82	0.20	0.40
Large value	Mstar Large Cap TR	1.96	2.05	30.00	282.00	0.17	0.18
Large value	Russ 1000 Value	0.94	1.08	148.00	129.64	1.29	1.21
Mid-cap blend	Mstar Mid Cap TR	1.20	0.29	144.00	22.45	2.04	0.93
Mid-cap blend	S&P Midcap 400	1.16	0.95	105.00	98.50	1.77	1.16
Mid-cap growth	S&P Midcap 400	1.77	2.24	736.00	1331.00	1.35	0.83
Miscellaneous sector	Mstar Cons Good TR	2.97	0.28	993.00	41.00	0.31	0.39
Miscellaneous sector	Mstar Cons Srvs TR	4.03	0.28	1327.00	12.00	0.58	0.35
Natural res	Mstar Energy TR	2.00	0.28	102.00	25.00	0.34	0.28
Real estate	DJ Wilshire REIT T	2.28	1.00	776.00	20.00	0.53	2.79
Small blend	Mstar Small Cap TR	1.15	0.28	72.00	34.00	1.30	1.08
Small blend	Russ 2000	1.38	1.02	216.00	63.55	1.44	1.47
Utilities	DJ Utility	2.12	0.70	595.00	27.00	0.60	1.56
International stock funds							
Diversified emerging mkts	MSCI Em ND	1.95	0.30	2796.00	20.00	3.87	0.52
Foreign large blend	MSCI EAFE Ndtr_D	1.60	0.78	308.25	16.31	2.85	1.15
Foreign large blend	MSCI Wd x USN	1.14	1.34	73.67	44.08	1.51	1.54
Fixed-income funds							
Intermediate-term bond	Barcap US Univ Bon	0.43	0.57	27.67	433.00	1.78	1.72
Long government	Barcap LT Treasury	1.41	0.15	1142.00	56.00	1.08	1.58
Alternative funds							
Bear-market	Barcap LT Treasury	4.02	2.22	0.00	368.00	0.90	0.47
Bear-market	DJ Wilshire REIT T	2.39	2.03			0.70	1.56
Bear-market	Mstar Hardware TR	2.00	2.24			1.16	1.56
Bear-market	Russ 2000	2.07	2.12			3.22	0.92
Bear-market	S&P 500	1.97	2.06	519.60	1299.00	0.87	0.92
Currency	AMEX Gold Miners	1.91	2.10			3.09	1.04
Averages							
Domestic stock funds		1.81	0.93	333.82	138.51	0.84	0.82
<i>t</i> -test (probability)		0.00085**		0.03161*		0.44446	
International stock funds		1.56	0.81	1059.31	26.80	2.74	1.07
<i>t</i> -test (probability)		0.14643		0.17967		0.11426	
Fixed-income funds		0.92	0.36	584.84	244.50	1.43	1.65
<i>t</i> -test (probability)		0.28522		0.36371		0.28802	
Alternative funds		2.39	2.13	259.80	833.50	1.66	1.08
<i>t</i> -test (probability)		0.22198		0.10958		0.16435	
All funds		1.84	1.11	427.54	185.43	1.22	0.95
<i>t</i> -test (probability)		0.00015**		0.04221*		0.07885	

EIFs: enhanced index funds; PIFs: pure index funds.

**, *: Significant at the 0.01, 0.05 level.

10 times the portfolio value. The highest turnover among PIFs occurs in alternative funds, though the turnover rate is under nine times. Tax cost ratios vary to a significant degree to make the difference between EIFs and PIFs insignificant.

5.2. *Mutual fund returns and risks*

Average annual returns and return percentile rank within Morningstar categories are summarized in Table 3 and Table 4, respectively. The significance of the difference between EIFs-based and PIFs-based values is provided in the second row below the averages. No T-statistics are provided in instances wherein only one Morningstar category had both EIFs and PIFs for the specified time period in Tables 3 through 6. On both return measures, during the 15-year period from April 1994 to March 2009, EIFs provided worse performance. As shown in the far right columns of Table 3, the average annualized return of domestic stock funds is about two percent higher for PIFs. EIFs in the categories of fixed-income funds have higher returns than PIFs during the most recent three years. Results are inconclusive for international stock funds and alternative funds.

During the last three years, EIFs have lower returns in 15 of the 20 Morningstar category/best fit index combinations of domestic stock funds than PIFs. The five exceptions that have higher EIF returns are large value funds (2 of 2 indexes), midcap blend funds (2 of 2 indexes), and midcap growth funds (with only one index in this category).

If a specified type of fund management technique had no impact on fund performance, we would expect the return percentile rank in category to be 50.00, or average. One would expect the PIFs to have close to this average value. For instance, across the 15-year period from April 1994 to March 2009, the return percentile rank for PIFs is 48.07. By contrast, the EIFs' return percentile rank is a low 85.13. Across all four time periods studied, the average rank value for EIFs never rises above 59.60, whereas PIFs range from 48.07 to 54.23. Domestic EIFs have had an average rank of 72.87 (near the bottom of the third quartile), while PIFs average rank is 51.70, across the four sample periods.

Standard deviations are summarized in Table 5. This study finds EIFs show higher standard deviations, as a whole, than PIFs during the past five years; and also for domestic stock funds and alternative funds in the past five years. Results are inconclusive for international stock funds and fixed-income funds. Across all time periods measured, the average standard deviation of PIFs is about 23% greater.

During the last three years, EIFs display higher standard deviations in 14 of the 20 Morningstar category/best fit index combinations of domestic stock funds than PIFs. The five exceptions that have lower standard deviations are large value funds (2 of 2 indexes), midcap blend funds (1 of 2 indexes), small blend funds (1 of 2 indexes), and midcap growth funds (the only index in this category). In one of three domestic, large growth category/best fit index combinations the EIF displays the same standard deviation as its PIF benchmark. EIFs display higher standard deviations in all three category/index combinations of alternative funds in the past five years.

Table 3 Mutual fund returns: average annual return (%)

Morningstar category	Best fit index	3-Year		5-Year		10-Year		15-Year	
		EIFs	PIFs	EIFs	PIFs	EIFs	PIFs	EIFs	PIFs
Domestic stock funds									
Financial	DJ Financial	-42.13	-29.53	-26.27	-16.03				
Health	DJ Healthcare	-10.34	-5.06	-4.36	-0.10				
Large blend	Mstar US Mkt TR	-14.73	-13.82	-5.04	-4.92	-2.74	-2.43		
Large blend	Russ 1000	-16.74	-13.00	-7.67	-4.35	-4.24	-2.44	4.94	5.79
Large blend	S&P 500	-19.23	-13.72	-8.81	-5.41	-5.22	-3.72	2.26	5.29
Large growth	Mstar Large Growth	-29.70	-17.25	-15.64	-7.78				
Large growth	NYSE Tech 100	-10.81	-10.46	-3.85	-3.42				
Large growth	Russ 1000 Growth	-15.22	-12.59	-5.51	-5.79	-2.79	-4.29		
Large value	Mstar Large Cap TR	-28.87	-28.90	-16.98	-16.92				
Large value	Russ 1000 Value	-16.08	-16.45	-5.38	-6.25				
Mid-cap blend	Mstar Mid Cap TR	-12.71	-15.38	-3.49	-3.71	6.00	1.78		
Mid-cap blend	S&P Midcap 400	-15.87	-16.40	-4.60	-4.87	3.10	2.63		
Mid-cap growth	S&P Midcap 400	-13.64	-14.28	-3.97	-4.67				
Miscellaneous sector	Mstar Cons Good TR	-15.26	-1.74	-8.54	1.15				
Miscellaneous sector	Mstar Cons Srvs TR	-24.57	-16.84	-14.92	-8.60				
Natural res	Mstar Energy TR	-16.04	-7.22						
Real estate	DJ Wilshire REIT T	-46.35	-26.16	-24.60	-9.84				
Small blend	Mstar Small Cap TR	-17.93	-16.71	-7.49	-4.97	-5.19	2.26	2.45	5.28
Small blend	Russ 2000	-22.64	-18.77	-9.45	-6.42	-0.26	2.57		
Utilities	DJ Utility	-12.57	-4.27	-1.12	3.55				
International stock funds									
Diversified emerging mkts	MSCI Em ND	-37.50	-8.54						
Foreign large blend	MSCI EAFE Ndr_D	-19.06	-14.67						
Foreign large blend	MSCI Wd x USN	-14.04	-17.86	-3.16	-5.88	-0.78	-0.87		
Fixed-income funds									
Intermediate-term bond	Barcap US Univ Bon	3.26	1.47	2.76	1.69				
Long government	Barcap LT Treasury	12.76	10.67						
Alternative funds									
Bear-market	Barcap LT Treasury	-14.31	-7.02						
Bear-market	DJ Wilshire REIT T	4.16	5.49						
Bear-market	Mstar Hardware TR	2.99	6.30	-5.64	0.58				
Bear-market	Russ 2000	6.55	11.74	-7.61	1.22				
Bear-market	S&P 500	15.02	12.36	2.60	4.46	-0.64	2.70		
Currency	AMEX Gold Miners	-0.19	0.91						
Averages									
Domestic stock funds		-20.07	-14.93	-9.35	-5.76	-1.42	-0.46	3.22	5.45
<i>t</i> -test (probability)		0.00057**		0.00116**		0.22621		0.04233*	
International stock funds		-23.53	-13.69	-3.16	-5.88	-0.78	-0.87		
<i>t</i> -test (probability)		0.21141		n.a.		n.a.			
Fixed-income funds		8.01	6.07	2.76	1.69				
<i>t</i> -test (probability)		0.02456*		n.a.					
Alternative Funds		2.37	4.96	-3.55	2.09	-0.64	2.70		
<i>t</i> -test (probability)		0.06399		0.05460		n.a.			
All funds		-14.25	-9.60	-7.86	-4.47	-1.28	-0.18	3.22	5.45
<i>t</i> -test (probability)		0.00052**		0.00051**		0.14913		0.04233*	

EIFs: enhanced index funds; PIFs: pure index funds.

**, *: Significant at the 0.01, 0.05 level

n.a.: No *t*-statistics provided in instances wherein only one Morningstar category had both EIFs and PIFs.

Table 4 Mutual fund returns: return percentile rank in category

Morningstar category	Best fit index	3-Year		5-Year		10-Year		15-Year	
		EIFs	PIFs	EIFs	PIFs	EIFs	PIFs	EIFs	PIFs
Domestic stock funds									
Financial	DJ Financial	91.75	72.00	90.38	68.00				
Health	DJ Healthcare	73.30	25.50	73.00	38.00				
Large blend	Mstar US Mkt TR	66.67	53.25	53.00	44.88	49.00	44.00		
Large blend	Russ 1000	82.65	39.00	83.55	34.50	79.00	44.20	60.89	29.50
Large blend	S&P 500	76.33	50.24	79.14	58.71	82.94	69.44	96.50	50.90
Large growth	Mstar Large Growth	99.00	49.67	99.33	56.17				
Large growth	NYSE Tech 100	22.75	19.17	34.75	27.50				
Large growth	Russ 1000 Growth	75.08	47.91	67.00	66.55	37.38	59.00		
Large value	Mstar Large Cap TR	99.00	99.00	99.00	99.00				
Large value	Russ 1000 Value	75.00	73.18	59.00	67.55				
Mid-cap blend	Mstar Mid Cap TR	23.00	52.36	35.00	39.55	12.00	56.88		
Mid-cap blend	S&P Midcap 400	59.25	46.78	56.83	44.82	38.25	44.38		
Mid-cap growth	S&P Midcap 400	40.33	47.50	51.00	60.00				
Miscellaneous sector	Mstar Cons Good TR	44.50	3.00	82.00	5.00				
Miscellaneous sector	Mstar Cons Srvs TR	96.00	67.00	96.00	83.00				
Natural res	Mstar Energy TR	83.50	6.00						
Real estate	DJ Wilshire REIT T	99.50	57.71	99.50	62.29				
Small blend	Mstar Small Cap TR	55.00	37.40	81.00	43.00	98.00	76.80	98.00	63.80
Small blend	Russ 2000	73.50	49.84	73.89	55.57	85.44	68.87		
Utilities	DJ Utility	99.00	52.00	99.00	60.00				
International stock funds									
Diversified emerging mkts	MSCI Em ND	100.00	29.00						
Foreign large blend	MSCI EAFE Ndr_D	75.50	46.10						
Foreign large blend	MSCI Wd x USN	36.33	75.08	60.00	95.88	44.00	46.25		
Fixed-income funds									
Intermediate-term bond	Barcap US Univ Bon	38.33	57.00	32.33	53.00				
Long government	Barcap LT Treasury	14.75	37.00						
Alternative funds									
Bear-market	Barcap LT Treasury	93.67	82.50						
Bear-market	DJ Wilshire REIT T	67.00	63.50						
Bear-market	Mstar Hardware TR	73.60	61.50	76.20	64.50				
Bear-market	Russ 2000	59.33	38.00	91.67	57.00				
Bear-market	S&P 500	16.20	32.50	31.40	17.00	70.00	30.50		
Currency	AMEX Gold Miners	68.00	54.25						
Averages									
Domestic stock funds		71.76	47.43	74.34	53.37	60.25	57.95	85.13	48.07
<i>t</i> -test (probability)		0.00013**		0.00040**		0.40347		0.00673**	
International stock funds		70.61	50.06	60.00	95.88	44.00	46.25		
<i>t</i> -test (probability)		0.29321		n.a.		n.a.			
Fixed-income funds		26.54	47.00	32.33	53.00				
<i>t</i> -test (probability)		0.02778*		n.a.					
Alternative funds		62.97	55.38	66.42	46.17	70.00	30.50		
<i>t</i> -test (probability)		0.10627		0.05387		n.a.			
All funds		67.03	49.19	71.00	54.23	59.60	54.03	85.13	48.07
<i>t</i> -test (probability)		0.00055**		0.00152**		0.25474		0.00673**	

EIFs: enhanced index funds; PIFs: pure index funds.

**, *: Significant at the 0.01, 0.05 level.

n.a.: No *t*-statistics provided in instances wherein only one Morningstar category had both EIFs and PIFs.

Table 5 Mutual fund risk: standard deviation (%)

Morningstar category	Best fit index	3-Year		5-Year		10-Year	
		EIFs	PIFs	EIFs	PIFs	EIFs	PIFs
Domestic stock funds							
Financial	DJ Financial	37.95	28.20	30.94	23.10		
Health	DJ Healthcare	22.02	13.77	19.55	12.89		
Large blend	Mstar US Mkt TR	18.37	18.20	15.16	15.33	16.34	16.20
Large blend	Russ 1000	20.27	17.86	16.32	14.97	16.46	16.74
Large blend	S&P 500	22.11	17.85	18.46	14.85	18.00	16.01
Large growth	Mstar Large Growth	44.19	29.42	39.38	26.21		
Large growth	NYSE Tech 100	22.04	22.04	19.59	19.58		
Large growth	Russ 1000 Growth	18.40	18.01	16.16	15.08	19.37	17.11
Large value	Mstar Large Cap TR	33.22	32.86	27.88	27.63		
Large value	Russ 1000 Value	18.76	19.04	15.73	15.89		
Mid-cap blend	Mstar Mid Cap TR	21.48	20.68	19.07	18.12	24.55	20.03
Mid-cap blend	S&P Midcap 400	20.58	22.40	17.92	19.50	17.72	19.28
Mid-cap growth	S&P Midcap 400	20.55	21.05	17.58	18.00		
Miscellaneous sector	Mstar Cons Good TR	21.94	12.62	19.23	10.76		
Miscellaneous sector	Mstar Cons Srvs TR	27.53	22.17	23.63	18.88		
Natural res	Mstar Energy TR	36.59	25.28				
Real estate	DJ Wilshire REIT T	46.35	33.72	41.10	29.11		
Small blend	Mstar Small Cap TR	21.27	21.88	18.02	19.64	17.27	20.73
Small blend	Russ 2000	24.12	22.63	21.75	20.75	22.68	20.03
Utilities	DJ Utility	25.72	16.41	22.11	14.20		
International stock funds							
Diversified emerging mkts	MSCI Em ND	61.14	30.10				
Foreign large blend	MSCI EAFE Ndr_D	24.19	21.57				
Foreign large blend	MSCI Wd x USN	22.89	22.19	20.48	18.97	19.45	17.50
Fixed-income funds							
Intermediate-term bond	Barcap US Univ Bon	3.86	4.55	3.64	4.08		
Long government	Barcap LT Treasury	22.11	12.01				
Alternative funds							
Bear-market	Barcap LT Treasury	21.11	8.82				
Bear-market	DJ Wilshire REIT T	6.66	33.30				
Bear-market	Mstar Hardware TR	41.76	21.33	37.23	19.02		
Bear-market	Russ 2000	44.30	21.21	38.88	19.22		
Bear-market	S&P 500	31.69	16.42	26.44	13.72	30.45	15.56
Currency	AMEX Gold Miners	18.92	9.22				
Averages							
Domestic stock funds		26.17	21.80	22.08	18.66	19.05	18.27
<i>t</i> -test (probability)		0.00071**		0.00223**		0.20857	
International stock funds		36.07	24.62	20.48	18.97	19.45	17.50
<i>t</i> -test (probability)		0.18166		n.a.		n.a.	
Fixed-income funds		12.99	8.28	3.64	4.08		
<i>t</i> -test (probability)		0.27171		n.a.			
Alternative funds		27.41	18.38	34.18	17.32	30.45	15.56
<i>t</i> -test (probability)		0.13901		0.00767**		n.a.	
All funds		26.52	20.54	22.76	17.90	20.23	17.92
<i>t</i> -test (probability)		0.00117**		0.00049**		0.08822	

EIFs: enhanced index funds; PIFs: pure index funds.

**, *: Significant at the 0.01, 0.05 level.

n.a.: No *t*-statistics provided in instances wherein only one Morningstar category had both EIFs and PIFs.

Table 6 Mutual fund risk-adjusted return: sharpe ratio

Morningstar category	Best fit index	3-Year		5-Year		10-Year	
		EIFs	PIFs	EIFs	PIFs	EIFs	PIFs
Domestic stock funds							
Financial	DJ Financial	-1.32	-1.20	-0.90	-0.77		
Health	DJ Healthcare	-0.56	-0.55	-0.32	-0.18		
Large blend	Mstar US Mkt TR	-0.96	-0.91	-0.47	-0.46	-0.28	-0.27
Large blend	Russ 1000	-0.97	-0.88	-0.60	-0.43	-0.37	-0.25
Large blend	S&P 500	-1.00	-0.93	-0.56	-0.51	-0.38	-0.35
Large growth	Mstar Large Growth	-0.63	-0.59	-0.30	-0.27		
Large growth	NYSE Tech 100	-0.56	-0.54	-0.26	-0.24		
Large growth	Russ 1000 Growth	-0.99	-0.85	-0.46	-0.53	-0.22	-0.36
Large value	Mstar Large Cap TR	-0.94	-0.96	-0.63	-0.64		
Large value	Russ 1000 Value	-1.02	-1.03	-0.47	-0.52		
Mid-cap blend	Mstar Mid Cap TR	-0.68	-0.86	-0.25	-0.29	0.23	0.04
Mid-cap blend	S&P Midcap 400	-0.90	-0.82	-0.35	-0.30	0.08	0.08
Mid-cap growth	S&P Midcap 400	-0.77	-0.79	-0.32	-0.35		
Miscellaneous sector	Mstar Cons Good TR	-0.80	-0.35	-0.53	-0.13		
Miscellaneous sector	Mstar Cons Srvs TR	-1.00	-0.87	-0.69	-0.55		
Natural res	Mstar Energy TR	-0.38	-0.30				
Real estate	DJ Wilshire REIT T	-1.11	-0.81	-0.51	-0.30		
Small blend	Mstar Small Cap TR	-0.98	-0.88	-0.51	-0.32	-0.40	0.06
Small blend	Russ 2000	-1.08	-0.94	-0.45	-0.35	0.00	0.07
Utilities	DJ Utility	-0.52	-0.39	-0.08	0.10		
International stock funds							
Diversified emerging mkts	MSCI Em ND	-0.46	-0.26				
Foreign large blend	MSCI EAFE Ndr_D	-0.88	-0.78				
Foreign large blend	MSCI Wd x USN	-0.69	-0.93	-0.20	-0.39	-0.10	-0.15
Fixed-income funds							
Intermediate-term bond	Barcap US Univ Bon	-0.01	-0.40	-0.09	-0.34		
Long government	Barcap LT Treasury	0.50	0.63				
Alternative funds							
Bear-market	Barcap LT Treasury	-0.79	-1.18				
Bear-market	DJ Wilshire REIT T	0.14	0.23				
Bear-market	Mstar Hardware TR	0.19	0.24	-0.06	-0.05		
Bear-market	Russ 2000	0.28	0.47	-0.10	-0.01		
Bear-market	S&P 500	0.48	0.58	0.10	0.16	0.03	0.04
Currency	AMEX Gold Miners	-0.09	-0.22				
Averages							
Domestic stock funds		-0.86	-0.77	-0.46	-0.37	-0.17	-0.12
<i>t</i> -test (probability)		0.00343**		0.00259**		0.26931	
International stock funds		-0.68	-0.66	-0.20	-0.39	-0.10	-0.15
<i>t</i> -test (probability)		0.44720		n.a.		n.a.	
Fixed-income funds		0.25	0.12	-0.09	-0.34		
<i>t</i> -test (probability)		0.35242		n.a.			
Alternative funds		0.04	0.02	-0.02	0.03	0.03	0.04
<i>t</i> -test (probability)		0.43455		0.07480		n.a.	
All funds		-0.60	-0.55	-0.38	-0.32	-0.14	-0.11
<i>t</i> -test (probability)		0.07317		0.02731*		0.29009	

EIFs: enhanced index funds; PIFs: pure index funds.

**, *: Significant at the 0.01, 0.05 level.

n.a.: No *t*-statistics provided in instances wherein only one Morningstar category had both EIFs and PIFs.

5.3. *Mutual fund risk-adjusted returns*

Sharpe ratios are summarized in Table 6. This study finds EIFs possess significantly lower Sharpe ratios, as a whole during the past five years, from April 2004 to March 2009. Though negative, the Sharpe ratios of domestic stock PIFs are significantly higher at the 0.01 level. Results are inconclusive for international stock funds, fixed-income funds, and alternative funds.

During the last three years, EIFs yield lower Sharpe ratios in 16 of the 20 category/index combinations of domestic stock funds than PIFs. The four exceptions that have higher Sharpe ratios are large value funds (2 of 2 indexes), midcap blend funds (1 of 2 indexes), and midcap growth funds (the only best fit index). Domestic stock funds almost always had the lowest Sharpe ratio, across sample periods and fund type.

5.4. *Mutual fund market risks and risk-adjusted returns*

Three-year betas and alphas calculated using standard market surrogates are summarized in Table 7's first set of columns. This study finds EIFs possess higher betas and lower alphas, as a whole and for domestic stock funds, than PIFs. EIFs tend to have betas that are about 20% higher than the market index. Results are inconclusive for international stock funds.

The second set of columns in Table 7 present betas and alpha combinations wherein the best fit index is used as the market surrogate. Here one can again see that the PIFs provide lower betas and higher alphas. The domestic stock fund and all stock fund betas and alphas are significant at the 0.01 level. EIF alphas are about 2.5% lower than alphas of their PIF benchmark.

During the last three years, EIFs yield higher betas in 14 of the 20 Morningstar category/best fit index combinations of domestic stock funds than PIFs. The five exceptions that have lower betas are large value funds (1 of 2 indexes), midcap blend funds (2 of 2 indexes), midcap growth funds (1 of 1 index), and small blend funds (1 of 2 indexes). One large growth fund combination, out of three possible best fit indexes, displays the same betas. During the same three years, EIFs yield lower alphas in 13 of the 20 combinations of domestic stock funds than PIFs. The seven exceptions that have higher alphas are sector funds in health care, midcap growth and natural resources funds (for the only best fit index in each case), large growth funds (1 of 3 indexes), large value funds (2 of 2 indexes), and midcap blend funds (1 of 2 indexes).

6. **Conclusion**

EIFs are designed to build upon the basic principles of index investing (i.e., tracking an index and keeping expenses low) through effective selection and weighting of securities (or derivatives thereof). Past research comparing the performance of EIFs and PIFs has reported a variety of EIFs success. This updated and thorough comparison of EIFs and PIFs finds that EIFs, on the whole, exhibit generally higher expense ratios and annual turnover rates than PIFs. EIFs, as a whole and in domestic stock fund categories, appear to have performed

Table 7 Mutual fund market-related performance: three-year betas and alphas (%)

Morningstar category	Best fit index	Against standard index				Against best fit index			
		Beta		Alpha		Beta		Alpha	
		EIFs	PIFs	EIFs	PIFs	EIFs	PIFs	EIFs	PIFs
Domestic stock funds									
Financial	DJ Financial	1.73	1.39	-22.49	-11.85	1.31	0.99	-4.94	0.30
Health	DJ Healthcare	0.92	0.57	2.62	1.39	1.25	0.79	-1.01	-0.82
Large blend	Mstar US Mkt TR	1.04	1.02	-1.23	-0.36	1.02	1.01	-1.51	-0.64
Large blend	Russ 1000	1.10	1.01	-2.17	0.25	1.09	0.99	-2.25	0.14
Large blend	S&P 500	1.25	1.01	-2.54	-0.57	1.25	1.01	-2.54	-0.57
Large growth	Mstar Large Growth	2.26	1.49	7.87	5.81	2.28	1.51	4.97	3.96
Large growth	NYSE Tech 100	1.12	1.11	5.22	5.47	1.08	1.08	2.01	2.35
Large growth	Russ 1000 Growth	0.99	0.99	-2.49	0.37	1.00	0.99	-4.42	-1.59
Large value	Mstar Large Cap	1.84	1.82	-2.14	-2.76	1.90	1.88	-3.31	-3.91
	TR								
Large value	Russ 1000 Value	1.04	1.05	-2.71	-2.90	0.99	1.00	-0.92	-1.13
Mid-cap blend	Mstar Mid Cap	1.12	1.13	3.08	-0.05	0.99	0.99	3.53	0.27
	TR								
Mid-cap blend	S&P Midcap 400	1.12	1.22	-0.82	0.46	0.99	1.08	-2.77	-1.60
Mid-cap growth	S&P Midcap 400	1.08	1.11	1.19	1.05	0.98	1.01	-0.47	-0.55
Miscellaneous sector	Mstar Cons Good	1.13	0.62	0.39	5.38	1.47	0.83	-7.37	1.28
	TR								
Miscellaneous sector	Mstar Cons Srvs	1.44	1.16	-4.77	-1.01	1.48	1.19	-7.94	-3.63
	TR								
Natural Res	Mstar Energy TR	1.40	0.96	8.32	7.44	1.50	1.03	-5.81	-2.17
Real estate	DJ Wilshire REIT	2.17	1.50	-17.18	-3.55	1.34	0.99	-13.58	0.41
	T								
Small blend	Mstar Small Cap	1.16	1.19	-2.47	-0.38	0.97	1.00	-1.80	0.38
	TR								
Small blend	Russ 2000	1.28	1.21	-6.01	-2.44	1.10	1.04	-5.02	-1.49
Utilities	DJ Utility	1.07	0.74	3.50	5.22	1.56	0.92	-6.86	-2.55
International stock funds									
Diversified emerging	MSCI Em ND	2.74	1.36	17.63	14.98	1.98	1.00	-13.81	-0.40
	mkts								
Foreign large blend	MSCI EAFE	1.15	1.02	-2.21	0.34	1.15	1.02	-2.21	0.34
	Ndtr_D								
Foreign large blend	MSCI Wd x USN	1.08	1.05	2.34	-2.79	1.08	1.05	1.77	-3.39
Averages									
Domestic stock funds		1.31	1.12	-1.74	0.35	1.28	1.07	-3.10	-0.58
<i>t</i> -test (probability)		0.00121**		0.01575*		0.00108**		0.00376**	
International stock funds		1.66	1.14	5.92	4.18	1.40	1.02	-4.75	-1.15
<i>t</i> -test (probability)		0.17935		0.26081		0.16726		0.28636	
All stock funds		1.36	1.12	-0.74	0.85	1.29	1.06	-3.32	-0.65
<i>t</i> -test (probability)		0.00152**		0.03948*		0.00057**		0.00485**	

EIFs: enhanced index funds; PIFs: pure index funds.

**, *: Significant at the 0.01, 0.05 level.

worse than their PIFs counterpart with lower returns, higher risks and lower risk-adjusted returns. Although EIFs in fixed-income funds appear to have performed *better* than their PIFs counterpart with regard to returns, risk measures and risk-adjusted return results were

inconclusive. Results are also inconclusive for international stock funds and alternative funds.

EIFs are a hybrid between actively managed funds and PIFs. Their explicit objective is to outperform a benchmark index while maintaining a low tracking error. Uninformed investors would expect EIFs to live up to their name and enhance portfolio performance. Our results, based on 15-year data from Morningstar, however, suggest that EIFs have mostly lower returns, much higher risks, and end up with lower risk-adjusted returns. EIFs behaved more like actively managed funds, with higher expense ratios and turnover rates. In short, investors should be wary of sales pitches hyping the value of EIFs!

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