

## **Does Index Investing Work Well in Sector Funds?**

C. Edward Chang, George S. Swales, Jr. and Tsu-Hong Yen

### **Introduction**

Index investing is a strategy that attempts to approximate the performance of a broad market index. Index investing has grown significantly in recent years in the U.S. and other developed countries as investors have become less satisfied with the performance of actively managed alternatives (Baer and Gensler, 2002; Ferri, 2002; Swedroe, 2004; Woolley and Bird, 2003). The first index mutual fund was created in 1976. The second index fund didn't see the light of day until eight years later. During the first several years, it was proclaimed a flawed concept: "why would an investor settle for average returns?" After three decades, the market share of index funds constitutes 17% of equity fund assets: 10% by classic index mutual funds and 7% by the exchange-traded funds (Bogle, 2007).

The growing popularity of sector investing has led to a proliferation of sector investment vehicles in recent years. For example, from 1998 to 2003, the number of actively managed Information Technology funds has nearly tripled, while the number of Financials and Healthcare funds doubled (Edwards and Dash, 2003). Index-based sector investing vehicles have also proliferated, with a number of sector mutual funds and exchange-traded funds now available. The debate on the merits of active and index investing is relatively new for sector investing, unlike the old debate for broad-based size (large-, mid-, or small-cap) or style (value, growth or blend) segments of the market. The new debate for sector investing assumes importance in light of increasing interest in sector investing and a growing number of active and passive investment options.

This paper contributes to the debate by examining characteristics, risk and performance measures of all available vehicles for index investing in U.S. sector funds. In this study, funds used in index investing include not only sector index mutual funds (hereafter "sector index funds"), but also their recently emerging close substitutes --- sector exchange-traded funds (hereafter "sector ETFs"). Enhanced index funds, a hybrid between actively-managed funds and passive index funds, are not included because these funds have behaved more like actively-managed funds (Chang and Swales, 2006). Our results would help shed light on the following two issues. First, how do sector index funds perform compared with average of all sector mutual funds, and thus actively-managed funds? Second, how well do sector ETFs perform?

### **Pros and Cons of Equity Index Investing**

Broad-based index funds have several advantages. By their very nature, index funds ensure widely diversified assets. They typically cost less to operate than actively managed equity funds because they have lower turnover and transaction costs, and require no research into

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individual stocks. Consequently, index fund expense ratios are generally lower than those of actively managed equity funds. Other factors being equal, this could increase an index fund investor's return. For investors wishing to minimize taxes, the lower turnover rate of index funds reduces the likelihood of capital gain distributions. Most studies (see Haslem (2003, pp. 308-311) for a recent review) find that actively managed mutual funds under perform passively managed portfolios. Fund net returns are negatively related to expenses. Moreover, the higher portfolio turnover, the lower fund net returns relative to benchmark indices (Madlem, 1999, p. 20).

There are some potential drawbacks to index investing. The index fund manager cannot react to trends within market sectors by shifting assets from one to another. Index funds offer no opportunity to outperform their indices. Diversification cannot protect against loss in a declining market. Though equity index funds boast extensive diversification within their own universe, they can be limiting on a broader scale. For example, an index fund including only U.S. stocks does not offer the diversity or performance opportunity of a portfolio that includes international stocks, bonds, and money market investments. This paper investigates how well index investing works on a narrower scale – sector funds.

The percentage of conventional mutual funds that focus on a single sector or industry is about 6%. By contrast, more than 40% of all ETFs are sector or industry funds (Culloton, 2006). The history of sector mutual funds shows investors tend to misuse them. They chase hot returns and then dump the funds when they cool off (O'Neal, 2000). Academic research shows that investors are generally "horrible" market timers (Spence, 2002). Usually the narrower the sector funds, the higher are their costs. Many sector funds are concentrated in a handful of firms (Madlem, 1999, p. 21), because they are composed of slices of market-cap-weighted equity indexes. Khorana and Nelling (1997) find that sector funds tend to be less diversified than other equity funds, and they exhibit larger total risk, but do not entail greater systematic risk.

### **Data and Methodology**

Sector mutual funds are defined by Morningstar as domestic equity mutual funds that specialize in a particular sector of the market, including communications, financials, health care, natural resources, precious materials, real estate, technology, utilities, and convertible bond. Sector mutual funds with at least three-year data available on June 30, 2006, were collected from Morningstar and Yahoo! Finance. Table I shows of 1,034 sector mutual funds, only twelve were index funds. These twelve sector index funds were supplemented with 27 sector ETFs for investigation of index investing. In order to make meaningful comparisons, we choose to compare funds with matching category and duration (time period), and not all available funds. Average expense ratios and turnover rates were calculated for these categories as were Morningstar return, risk and star ratings. Conventional return, risk, and risk-adjusted return measures as suggested by Simons (1998) are calculated. All these measures were contrasted in two panels. The first panel is to compare sector index funds and average of all sector mutual funds. The second panel is to compare sector ETFs and average of all sector mutual funds.

### Findings

Expense ratios and annual turnover rates are shown in Table II. Most sector index funds have lower expense ratios and annual turnover rates than actively-managed sector mutual funds. An exception is the only sector index fund (CNCRX) in the health care category, which has an exceptionally high expense ratio (4.45%). Sector ETFs have even lower expense ratios and annual turnover rates than both sector index funds and actively-managed sector mutual funds.

Morningstar's proprietary return, risk and star (or risk-adjusted return) ratings are shown in Table III. Morningstar rates mutual funds from one to five stars based on how well they have performed (after adjusting for risk and accounting for sales charges) in comparison to similar funds. Within each Morningstar category, the top 10% of funds receive five stars, the next 22.5% four stars, the middle 35% three stars, the next 22.5% two stars, and the bottom 10% receive one star. Funds are rated for up to three time periods (three-, five-, and ten-years) and these ratings are combined to produce an overall rating. Return and risk ratings are done in the same manner.

Using overall ratings, this study finds sector index funds exhibit statistically insignificantly higher return (3.06), lower risk (2.94), and lower risk-adjusted return (2.81) than the average of all sector mutual funds. Exceptions are (1) real estate sector index funds exhibiting lower return and higher risk, and (2) technology sector index funds exhibiting higher return, lower risk and higher risk-adjusted return. This study also finds sector ETFs exhibit statistically significantly lower return (2.64), similar risk (3.01) and lower risk-adjusted return (2.67). Only financials sector ETFs performed differently with higher return, higher risk, and higher risk-adjusted return.

Plus-or-minus return for sector index funds in each category over the past fifteen-year period and annualized returns for sector ETFs over the past three- and five-year period are shown in Table IV. We use NAV returns for sector mutual funds and market returns for sector ETFs. This study finds sector index funds underperformed or performed only as well as the average of all sector mutual funds in their respective category. Some exceptions are sector index funds in the category of health care over the past three-year period. Real estate sector index funds have underperformed their category average over the past ten-year period. Sector ETFs exhibit significantly lower market returns than the average of all sector mutual funds in their respective category over both three-year and five-year periods. Exceptions are financials sector ETFs over the past 3-year period and real estate ETFs over the past 5-year period, which had slightly higher returns.

Table V shows results of standard deviations (total or stand-alone risk) over the past three-, five- and ten-year periods. Both sector index funds and sector ETFs have mixed and statistically insignificant results, compared with the average of all sector mutual funds in their respective category. Real estate sector index funds exhibit higher risk over the five-year period, but lower risk during the ten-year period. Moreover, technology sector index funds exhibit lower risk over the ten-year period. With the exception of the health care sector, sector ETFs exhibit higher risk than sector index funds.

Additional three-, five- and ten-year results of systematic or market risk, measured by beta coefficients, and risk-adjusted returns, measured by Alphas, is shown in Table VI and Table VII. Sector index funds exhibit significantly lower market risk and insignificantly higher risk-adjusted return than the average of all sector mutual funds. Sector ETFs exhibit statistically significantly lower market risk for the 3-year period and lower risk-adjusted return for the 5-year period than the average of all sector mutual funds.

### **Conclusion**

The authors of this study find sector index funds and sector ETFs have lower expense ratios and lower turnover rates than the average of actively-managed sector mutual funds in their respective category. Pure sector investing is for the active investor and is not a buy-and-hold technique. Unlike their counterparts for broad-based size or style segments of the market, sector index funds have at best performed only as well as the average of actively-managed sector mutual funds with lower risk and comparable return and risk-adjusted return. As newcomers, sector ETFs have had a good start, with the lowest expense ratios and turnover rates. Sector ETFs, however, have underperformed the average of actively-managed sector mutual funds with similar or lower risk, and statistically significantly lower return and risk-adjusted return since their inceptions.

Table I  
Number of Available Sector Funds as of June 30, 2006

## Panel I.A: Number of All Sector Mutual Funds

Morningstar Category	With 3-Year Data	With 5-Year Data	With 10-Year Data	With 15-Year Data
Specialty-Communications	41	41	11	5
Specialty-Financials	126	112	18	13
Specialty-Health Care	191	156	27	12
Specialty-Natural Resources	96	83	38	20
Specialty-Real Estate	205	152	47	6
Specialty-Technology	282	243	36	16
Specialty-Utilities	93	79	49	18
Total Number of Funds	1,034	866	226	90

## Panel I.B: Number of Sector Index (Mutual) Funds

Morningstar Category	With 3-Year Data	With 5-Year Data	With 10-Year Data	With 15-Year Data
Specialty-Communications				
Specialty-Financials				
Specialty-Health Care	1			
Specialty-Natural Resources				
Specialty-Real Estate	6	5	2	
Specialty-Technology	4	4	1	
Specialty-Utilities	1	1	1	1
Total Number of Funds	12	10	4	1

Note: Sector index (Mutual) Funds are part of All Sector Mutual Funds

## Panel I.C: Number of Sector Exchange-Traded Funds

Morningstar Category	With 3-Year Data	With 5-Year Data	With 10-Year Data	With 15-Year Data
Specialty-Communications	2	1		
Specialty-Financials	4	3		
Specialty-Health Care	4	3		
Specialty-Natural Resources	4	2		
Specialty-Real Estate	3	3		
Specialty-Technology	8	4		
Specialty-Utilities	2	2		
Total Number of Funds	27	18		

Note: Sector Exchange-Traded Funds are not part of All Sector Mutual Funds

Table II  
Expense Ratio (%) and Annual Turnover (%)

Panel II.A: Sector Index Funds vs. Average of All Sector Mutual Funds

Morningstar Category	Expense Ratio		Annual Turnover	
	Sector IFs	Average	Sector IFs	Average
Specialty-Health Care	4.45	1.82	2.00	129.46
Specialty-Real Estate	0.87	1.56	15.50	87.91
Specialty-Technology	1.29	1.89	13.75	179.33
Specialty-Utilities	0.80	1.45	20.00	98.48
Average	1.85	1.68	12.81	123.80
T-test (probability)	0.423372499		0.007490604***	

\*\*\* Significant at the 0.01 level.

Panel II.B: Sector ETFs vs. Average of All Sector Mutual Funds

Morningstar Category	Expense Ratio		Annual Turnover	
	Sector ETFs	Average	Sector ETFs	Average
Specialty-Communications	0.63	1.65	18.00	254.32
Specialty-Financials	0.53	1.72	7.75	177.61
Specialty-Health Care	0.50	1.82	6.75	129.46
Specialty-Natural Resources	0.50	1.54	6.25	146.78
Specialty-Real Estate	0.40	1.56	19.67	87.91
Specialty-Technology	0.50	1.89	15.00	179.33
Specialty-Utilities	0.43	1.45	4.50	98.48
Average	0.50	1.66	11.13	153.41
T-test (probability)	0.000000417***		0.000244205***	

\*\*\* Significant at the 0.01 level.

Table III  
Morningstar Return, Risk, and Star Ratings

Panel III.A: Sector Index Funds vs. Average of All Sector Mutual Funds (3.00)

Morningstar Category	Return Rating		Risk Rating		Star Rating	
	Sector IFs	Average	Sector IFs	Average	Sector IFs	Average
Specialty-Health Care	3.00	3.00	3.00	3.00	2.00	3.00
Specialty-Real Estate	2.50	3.00	3.50	3.00	2.50	3.00
Specialty-Technology	3.75	3.00	2.25	3.00	3.75	3.00
Specialty-Utilities	3.00	3.00	3.00	3.00	3.00	3.00
Average	3.06	3.00	2.94	3.00	2.81	3.00
T-test (probability)	0.412000503		0.412000503		0.324994477	

Panel III.B: Sector ETFs vs. Average of All Sector Mutual Funds

Morningstar Category	Return Rating		Risk Rating		Star Rating	
	Sector ETFs	Average	Sector ETFs	Average	Sector ETFs	Average
Specialty-Communications	2.00	3.00	1.50	3.00	2.50	3.00
Specialty-Financials	3.25	3.00	3.50	3.00	3.25	3.00
Specialty-Health Care	2.25	3.00	2.50	3.00	2.25	3.00
Specialty-Natural Resources	2.00	3.00	2.25	3.00	2.25	3.00
Specialty-Real Estate	3.00	3.00	4.67	3.00	2.67	3.00
Specialty-Technology	3.00	3.00	3.13	3.00	2.75	3.00
Specialty-Utilities	3.00	3.00	3.50	3.00	3.00	3.00
Average	2.64	3.00	3.01	3.00	2.67	3.00
T-test (probability)	0.064569770*		0.492979561		0.028025512**	

\*\* Significant at the 0.05 level.

\* Significant at the 0.10 level.

Table IV  
Return Plus/Minus Category Average (%) and Average Annual Return (%)

Panel IV.A: Sector Index Funds vs. Category Average (Return Plus/Minus =0)

Morningstar Category	Return Plus/Minus Category Average			
	3-Year	5-Year	10-Year	15-Year
Specialty-Health Care	0.31			
Specialty-Real Estate	-1.25	-1.21	-0.33	
Specialty-Technology	-0.62	3.41		
Specialty-Utilities	-0.65	1.26	0.84	-0.02
Average	-0.55	1.15	0.26	-0.02
T-test (probability)	0.092*	0.239	0.369	

\* Significant at the 0.10 level.

Panel IV.B: Average Annual Return - Sector ETFs vs. Average of All Sector Mutual Funds

Morningstar Category	3-Year		5-Year	
	Sector ETFs	Average	Sector ETFs	Average
Specialty-Communications	10.65	16.86	-4.83	-1.06
Specialty-Financials	14.12	14.06	5.69	7.48
Specialty-Health Care	4.11	8.39	-1.35	1.70
Specialty-Natural Resources	32.42	34.11	15.25	19.12
Specialty-Real Estate	26.77	25.75	19.29	19.26
Specialty-Technology	9.22	10.26	-4.80	-4.53
Specialty-Utilities	17.09	18.16	3.95	4.30
Average	16.34	18.23	4.74	6.61
T-test (probability)	0.047387148**		0.013784318**	

\*\* Significant at the 0.05 level.

Table V  
Standard Deviation (%)

Panel V.A: Sector Index Funds vs. Average of All Sector Mutual Funds

Morningstar Category	3-Year		5-Year		10-Year	
	Sector IFs	Average	Sector IFs	Average	Sector IFs	Average
Specialty-Health Care	11.95	10.87				
Specialty-Real Estate	16.02	15.14	14.49	14.11	13.99	14.28
Specialty-Technology	15.20	18.66	26.27	30.13	30.35	33.63
Specialty-Utilities	8.60	8.62	14.78	14.21	15.35	14.02
Average	12.94	13.32	18.51	19.48	19.90	20.64
T-test (probability)	0.371189323		0.285720318		0.31791434	

Panel V.B: Sector ETFs vs. Average of All Sector Mutual Funds

Morningstar Category	3-Year		5-Year	
	Sector ETFs	Average	Sector ETFs	Average
Specialty-Communications	9.99	16.46	23.85	26.28
Specialty-Financials	9.38	10.07	14.15	13.53
Specialty-Health Care	10.46	10.87	16.57	13.91
Specialty-Natural Resources	19.36	20.10	20.12	21.91
Specialty-Real Estate	16.48	15.14	15.02	14.11
Specialty-Technology	19.01	18.66	29.09	30.13
Specialty-Utilities	9.63	8.62	15.33	14.21
Average	13.47	14.27	19.16	19.15
T-test (probability)	0.225420766		0.496011686	

Table VI  
Beta Coefficients

Panel VI.A: Sector Index Funds vs. Average of All Sector Mutual Funds

Morningstar Category	3-Year		5-Year		10-Year	
	Sector IFs	Average	Sector IFs	Average	Sector IFs	Average
Specialty-Health Care	0.56	0.76				
Specialty-Real Estate	0.93	0.92	0.42	0.42	0.26	0.30
Specialty-Technology	1.69	1.90	1.76	1.92	1.59	1.67
Specialty-Utilities	0.46	0.52	0.68	0.75	0.41	0.57
Average	0.91	1.03	0.95	1.03	0.75	0.85
T-test (probability)	0.061364002*		0.119821727		0.059041448*	

\* Significant at the 0.10 level.

Panel VI.B: Sector ETFs vs. Average of All Sector Mutual Funds

Morningstar Category	3-Year		5-Year	
	Sector ETFs	Average	Sector ETFs	Average
Specialty-Communications	0.82	1.62	1.34	1.59
Specialty-Financials	0.91	1.00	0.93	0.83
Specialty-Health Care	0.73	0.76	0.85	0.69
Specialty-Natural Resources	1.10	1.16	0.76	0.81
Specialty-Real Estate	0.96	0.92	0.44	0.42
Specialty-Technology	1.94	1.90	1.93	1.92
Specialty-Utilities	0.28	0.52	0.64	0.75
Average	0.96	1.13	0.98	1.00
T-test (probability)	0.098240872*		0.375142201	

\* Significant at the 0.10 level.

Table VII  
Alpha (%)

Panel VII.A: Sector Index Funds vs. Average of All Sector Mutual Funds

Morningstar Category	3-Year		5-Year		10-Year	
	Sector IFs	Average	Sector IFs	Average	Sector IFs	Average
Specialty-Health Care	1.78	-0.30				
Specialty-Real Estate	13.20	13.96	15.09	16.02	10.25	9.95
Specialty-Technology	-6.40	-7.04	-1.96	-4.42	4.68	-0.84
Specialty-Utilities	10.17	10.20	3.50	2.12	4.81	3.08
Average	4.69	4.21	5.54	4.57	6.58	4.06
T-test (probability)	0.241513906		0.217156686		0.12373943	

Panel VII.B: Sector ETFs vs. Average of All Sector Mutual Funds

Morningstar Category	3-Year		5-Year	
	Sector ETFs	Average	Sector ETFs	Average
Specialty-Communications	1.19	0.82	-5.90	-1.56
Specialty-Financials	3.50	2.70	3.11	4.92
Specialty-Health Care	-4.06	-0.30	-3.16	-0.39
Specialty-Natural Resources	18.34	19.16	13.13	16.71
Specialty-Real Estate	14.67	13.96	16.13	16.02
Specialty-Technology	-8.27	-7.04	-4.97	-4.42
Specialty-Utilities	11.50	10.20	2.07	2.12
Average	5.27	5.64	2.92	4.77
T-test (probability)	0.294970373		0.016151989**	

\*\* Significant at the 0.05 level.

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