

SPECIALTY BOND FUNDS: RETURNS, EXPENSES, EFFICIENT MARKETS

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ABSTRACT: There is a reduced probability that bond mutual funds can generate economic returns that outpace bond market benchmarks. Given the relatively narrow range of outcomes (compared with equity funds), costs and net returns are inextricably interlinked. Costs are the dominant factor explaining variation in returns. After the deduction of investment management costs, bond fund investors collectively underperform market averages. Expenses are a deadweight loss to investors. Investors should exercise caution before committing investment capital to high-cost bond funds. Since investors are unlikely to foretell the best-performing specialty (sector) bond mutual funds, they should be alert to a signpost that increases the probability of identifying winners--funds that levy below-average financial intermediation expenses.

INTRODUCTION

A bond is a long-term contract under which a borrower agrees to make payments of interest and principal, on predetermined dates, to the owners of the bond. Issuing bonds is a major source of funding for governments and corporations. Bond markets are more opaque and illiquid than equity markets, with many bonds trading infrequently.

Corporate bonds, unlike Treasury bonds, are exposed to default risk. Corporate bonds are senior to stocks in the event of bankruptcy and feature protective covenants in the indenture agreement. In reference to particular companies, bonds are less risky than stocks. Since they are fixed-income securities, bonds do not provide enhanced yields prompted by prosperous corporate performance.

Specialty bond funds focus on specific market sectors, securities, or investment categories. Bank loan funds primarily invest in floating rate bank loans. Emerging market bond funds invest the majority of their assets in developing countries. High yield bond funds seek a high level of current income by concentrating their investments in lower-quality corporate bonds. Multisector bond funds diversify their assets among government, corporate, foreign, and high-yield bonds. Ultrashort bond funds reduce interest-rate risk by investing in low-duration, investment-grade debt instruments. World bond funds invest either exclusively in foreign government and corporate debt or in a combination of U.S. and non-U.S. bonds.

Most investors gain exposure to bonds through mutual funds, especially through 401(k) accounts and other retirement-savings plans. Shareholders own a

pro rata share of all of the assets of the fund and are entitled to a pro rata share of the income.

Bonds and mutual funds invested in bonds are the primary financial assets competing with stocks and equity funds. Investors should allocate a portion of their assets to bonds to diversify the ineradicable uncertainty and risk of stocks and counterweight the variability of returns—consistent with their goals, circumstances and preferences,—and produce income that is more stable and predictable than from stocks.

Individual investors—perhaps in conjunction with an advisor—and professional money managers endeavor to design optimal portfolio allocations among various asset classes. Modern portfolio theory commonly performs an essential role in drafting these blueprints of investment plans.

The efficient market hypothesis postulates that the price of a financial asset such as common stock or a bond is identical to its underlying economic value. Investment professionals are persuaded that asset price and intrinsic value (the sum of the present value of a company's future cash flows) differ.

If the efficient market hypothesis is irrefutable then sophisticated portfolio construction methodologies, such as those designed by mutual fund managers, cannot succeed in delivering market-beating performance since these managers will not consistently discover undervalued securities.

INVESTMENT COSTS

The implication of the efficient market hypothesis is that an efficient stock or bond market will likely induce relatively similar gross returns from investing, causing net returns to be highly dependent on fees and expenses. Since there is a direct relationship between low costs and high returns, low expenses are a potent advantage.

Several researchers have examined these relationships and developed a methodology that is employed analogously in this study. Their focus has been various categories of fixed-income funds, measured over various time frames, and money market funds.

Blake, Elton, and Gruber (1993) documented that high expense ratios reduced returns. Bogle (1994) concluded that higher expenses were highly correlated with relative returns. In a subsequent study, Bogle (1999) reiterated and re-emphasized the importance of selecting lower-cost bond funds. Reichenstein (1999) demonstrated that higher expenses consistently predicted lower returns for taxable bond funds. Domian and Reichenstein (2002) extended Reichenstein's analysis to municipal bond funds. They concluded that expense ratios were consistent predictors of relative returns.

Domian and Reichenstein (2011) examined taxable bond funds and reported that expense ratios predicted a smaller fraction of bond fund returns than in earlier periods. They attributed this to the credit crisis. Moreover, they downplayed some of their results as a consequence of “errors in placing funds in their proper Morningstar categories.” (p. 112). This observation referred to

research conducted by Deng, McCann, and O'Neal establishing that the linear scale used by Morningstar "understates the credit risk in bond fund portfolios" (2010, p. 61). Their analysis resulted in Morningstar correcting its metric for credit risk as of 2010.

Seminal research on money market funds funds was conducted by Domian and Reichenstein (1997). They endorsed the commodity view of money market funds (often associated with Bogle, 1994), observing that these funds "have little ability to distinguish their portfolios from those of their competitors," (p. 171) and "primarily compete based on differences in expenses." (p. 172) Bogle (2007) employed an ordinal ranking of taxable money market funds in terms of returns and expenses. He reported that "costs tell virtually the entire story in money market funds." (p. 148)

The issue of expenses as a deadweight loss for bond funds has also been studied. Reichenstein reported strong statistical evidence of a one-to-one negative relation between expense ratios and net returns.

Bogle (1999) observed, with irony, that load funds typically had higher expense ratios, compounding the detrimental impact on investment performance. Reichenstein compared both the gross returns and net returns of load funds and no-load funds. The hypothesis that average gross returns were equal for load and no-load funds received robust support.

Legendary investor Warren Buffett addressed the issue of investment costs in Berkshire Hathaway's 2005 Annual Report. He commented that "investors have had experiences ranging from mediocre to disastrous" by not choosing a low-expense path. "There have been three primary causes: first: high costs, usually because investors traded excessively or spent far too much on investment management; second, portfolio decisions based on tips and fads rather than on thoughtful, quantified evaluation of businesses; and third, a start-and-stop approach to the market marked by untimely entries (after an advance had been long underway) and exits (after periods of stagnation or decline)...they should try to be fearful when others are greedy and greedy only when others are fearful."

Costs impede investment performance. Each dollar of fees, expenses, and sales charges is not merely removed immediately from investable assets, but is a continuous hemorrhage that dispenses financial punishment by mathematically compounding the cumulative penalty of the costs imposed.

The expenses extracted from an actively managed bond fund are a significant impediment to overcome. Accelerating fees and expenses are analogous to pouring sand on the gears of investment performance. Sustainable lower costs presage competitive advantages for fixed-income and equity mutual funds.

The portfolio management business is an intensely competitive search for undervalued securities. The stock and bond markets are dominated by highly sophisticated investors. Undervalued securities are those that have become disconnected from their intrinsic values, resulting in mispricing. These pricing mistakes are market inefficiencies. Two cautionary observations offered by Marks (2012) must be recognized and acknowledged. "Mispricings are hard to profit

from...it's nearly impossible for most investors to detect instances when the consensus has done a faulty job of pricing assets, and to act on those errors." (p. 2) Also, "Risk control—and consistent success in investing—requires an understanding of the fact that high returns don't just come along for the picking; others must create them for us by making mistakes...Superior investing is all about mistakes." (p. 9)

The efficient market theory predicts that: (a) operating expenses and trading costs (bid-ask spreads and the market impact of trades) instigate a malign effect and trigger a deadweight loss that must be wholly offset in order for a fund's performance to match a benchmark; (b) security market pricing reflects all publicly available information, compromising and eclipsing fund managers' ability to exploit opportunities to deploy assets in undervalued securities; and (c) there is an inverse relationship between the net returns and expense ratios of funds.

The implication of these hypotheses is that an efficient stock or bond market will likely induce relatively similar gross returns from investing, causing net returns to be highly dependent on fees and expenses. That is, the high (sometimes hyperkinetic) level of trading among active managers and their attendant costs undercuts and shrinks the net returns to investors. "People should engage in active investing only if they're convinced that (a) pricing mistakes occur in the market they're considering and (b) they—or the managers they hire—are capable of identifying those mistakes and taking advantage of them. Unless both of these things are true, any time, effort, transactions costs and management fees expended on active management will be wasted." (Marks, 2012, p. 2)

In such an environment, once investors have determined the asset classes appropriate for their portfolio, they should be vigilant sentinels and select investment vehicles such as index funds and/or low-cost competitors. The low-cost overhead of index funds accrues a formidable and durable advantage that compounds over time and elevates the probability of earning strong relative returns. Since there is a direct relationship between low costs and high returns, low expenses are a potent advantage. "There is a strong tendency for those funds that charge the lowest fees to the investor to produce the best net results." (Malkiel, 2007, p. 309)

If the empirical evidence from this research study affirms the efficient market theory, investors would maximize their prospects of attaining a market return by being assiduously focused on funds that do not extract high operating and trading costs or impose sales charges either as a price of admission or contractual exit outlay. In addition, presuming adequate diversification and an appropriate level of risk, other decision filters should be: the integrity of management as the stewards of shareholder capital, examples of which are transparent corporate disclosure and candid communications with shareholders; and alignment of interests with shareholders.

Manifestations of the latter are rational allocation of capital, moderate asset turnover, sensitivity to tax consequences, a management team that has invested substantial personal assets in its fund and also implemented policies designed to discourage short-term speculators and market timers, and periodic

closing of funds to new investors either to inhibit asset bloat or when confronted by diminished investment opportunities.

These guiding principles would counterweight Bogle (2008, p. 96), who opined, “The mission of the fund business has turned from managing assets to gathering assets, from stewardship to salesmanship.”

The stewardship grade ratings reported by Morningstar (assigned by evaluating regulatory issues, board quality, manager incentives, fees, and corporate culture) are functional proxies for these screening variables.

An examination of specialty (sector) bond mutual fund data is warranted to highlight evidence of the currency of the theory of efficient markets.

DATA AND METHODOLOGY

The database employed in this research study is Morningstar Principia Mutual Funds Advanced, dated May 2012 (data as of April 30, 2012). Each mutual fund and exchange-traded fund in Morningstar's fund universe is classified by investment objective and 3-year, 5-year, and 10-year compound average annual total return data (geometric total returns) are itemized along with allied information such as expense ratios. To be included in this study, a fund in a particular specialty (sector) bond fund category must have at least ten years of rate of return data, as reported by Morningstar. The total number of specialty bond funds satisfying this condition is 988. Table 1 enumerates the number of funds within various classifications.

Table 1: Specialty Bond Funds

<u>Funds</u>	<u>Category</u>	<u>Number of Funds</u>	<u>No-Load Funds</u>	<u>Load</u>
	Bank Loan	71	33	38
	Emerging Market	66	40	26
	High Yield	452	266	186
	Multisector	144	77	67
	Ultrashort	76	55	21
	World	179	112	67
	Total	988	583	405

The Morningstar data do not include total returns for terminated funds. This does not appear to be an issue of concern. “Prior studies have not found survivorship bias to be a significant problem for bond funds.” (Domian and Reichenstein, 2011, p. 109)

The Morningstar database incorporates different share classes, such as those labeled “A” shares, and both retail and institutional funds. These funds were maintained in this study because of the observed differences in expense ratios. The database reports expense ratios as of the date of publication. As noted by Domian and Reichenstein, “Expense ratios are quite stable. Therefore, it is easy to predict funds that will have low actual expenses before the fact.” (2002, p. 64)

Also, “Low-cost funds tend to remain low-cost funds and high-cost funds tend to remain high-cost funds.” (2011, p. 110) Similarly, they report a “general stability of expense ratios,” (2011, p. 112) reiterating and confirming their prior observation that “Most funds maintain stable expense ratios.” (1997, p. 182) Thus, while there is some variability, this research follows their path by employing the expense ratios reported by Morningstar for each fund, which are not averaged, as close approximations of operating costs.

Specialty (sector) bond funds consist of the following categories: bank loan, emerging market, high yield, multisector, ultrashort, and world. This study will examine each of these categories over multiple time periods: 3 years, 5 years, and 10 years.

The purpose of this research study is to investigate two empirical issues that are of vital interest to individual and institutional investors.

The first issue will address the extent to which higher-cost bond funds penalize shareholders by delivering lower rates of return, on average, in comparison with lower-cost funds.

The conventional wisdom is that funds with high expenses will provide noncompetitive yields unless they increase risk. In contrast, low-fee funds (with low turnover of assets) will achieve a rate of return matching the market return as closely as can reasonably be expected. Hence index funds and other low-cost funds should garner yields superior to most actively managed funds since they are not handicapped and undermined by high costs.

This issue will be addressed for each component of the preceding bond fund categories, as classified by Morningstar, for three time frames: 3 years, 5 years, and 10 years. Expense ratio data for each fund category will be divided into three groups and an average total return computed for each group. The data will be analyzed to test the hypothesis that lower-cost funds deliver superior average total returns and that higher-cost funds provide inferior average total returns. The results of this analysis are indispensable to investment decision-making since rational, opportunistic economic agents would re-design portfolios based on information reporting whether or not the level of expenses is the best predictor of future bond fund performance.

The second issue of exploration in this research study will be to examine the proposition that expenses are a deadweight loss. Expenses do not simply reduce returns. Efficient market theory contends that there exists a roughly one-to-one inverse relationship between expenses imposed by mutual funds and their total returns. Evidence in support of this relationship was reported by Blake, Elton, and Gruber (1993). Domian and Reichenstein (2011, p. 110) declared: “If bond markets are perfectly efficient then the expense coefficient should be -1.” This prediction is more demanding and precisely formulated than the first research issue to be addressed. It tests the hypothesis that the estimated slope coefficient in a regression analysis is not statistically different from negative one (-1). That is, if the expense ratio of a fund increases by one percentage point, then the fund's total return decreases by one percentage point. Regression analyses will be performed in testing the deadweight loss hypothesis for each of the six

mentioned fund categories for three time horizons: 3 years, 5 years, and 10 years.

SALES CHARGES

The first hypothesis to be tested is that mutual fund sales charges assessed either upon purchase or redemption are a deadweight loss. Since gross returns are independent of and liberated from sales loads, and thus exclude the impact on portfolio performance, this test compares gross returns of load funds and no-load funds for each of the six specialty bond fund categories.

The null hypothesis states that average gross returns are equal for load funds and no-load funds. That is, the average gross rate of return is not shaped or influenced by an investor's decision to pay or shun sales fees. Statistical support for this contention would affirm the deadweight loss hypothesis, wherein the deadweight loss is measured by the sales charge.

Section A of Table 2 through Table 7 addresses this issue. The initial step is to compute the gross return of each fund in each category. Gross return is equal to net return plus expense ratio. After separating load funds from no-load funds, the average 3-year, 5-year, and 10-year gross returns are computed for each fund category and reported in Section A. Finally, a two-sample hypothesis test is conducted to test whether or not gross returns on load funds can be discriminated from gross returns on no-load funds.

The hypothesis that there is no statistical difference between the means, applying a 95% level of confidence, cannot be rejected in 18 out of 18 (100%) tests (three time horizons for each of the six fund categories). There is little statistical support for the alternative hypothesis that average gross returns differ between load funds and no-load funds. Load funds do not deliver superior net returns. Managers of no-load funds are equally skilled in comparison with managers of load funds. (A secondary test compared average net returns for no-load funds and load funds in each time period. These data are not as pure as above since fund-management costs are affecting net performance whereas they have no impact on gross performance. In 17 out of 18 instances the no-load funds, as a consequence of their lower expense ratios factored into this analysis, earned either statistically equal or greater net returns.)

This conclusion garners support from logic as well as quantitative evaluation. Sales charges, whether collected at purchase or sale, are shared between brokerage organizations and affiliated investment advisors. They are not distributed to mutual fund management teams and hence should not affect investment performance.

The decision to consent to a sales load when allocating risk-capital is defensible for those economic agents unschooled in investment analysis and/or unwilling to commit the requisite time, resources and energy to researching no-load fund alternatives. But many investors who are not constrained by these parameters voluntarily pay commission charges. Apparently, they have cultivated the impression that higher costs correlate with higher returns. Historical

information is viewed as an unreliable messenger. Emotional devotion to the task of outwitting the market is costumed as statistical likelihood, with insufficient regard to empirical evidence.

Table 2: Bank Loan FundsA. Gross Return

		<u>Gross Return (%)</u>			
		Fund			
	<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
	No-Load	33	15.41	3.81	5.40
	Load	38	15.28	3.79	5.50
Statistically Different Gross Return?			No	No	No

B. Net Return

		<u>Net Return (%)</u>				Expense	Combined
		Fund				Ratio	Load
	<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>		
	No-Load	33	14.29	2.69	4.28	1.12	
	Load	38	13.66	2.17	3.88	1.62	2.41
					<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Slope Coefficient (71 observations)					1.12	-3.23	-1.40
p Value					.17	1.36E-08	4.12E-06
R ²					.03	.38	.27
Slope Statistically Different from 0?					No	Yes	Yes
Slope Statistically Different from -1?					Yes*	Yes	No

*Not significantly different from -1 at a 99% level of significance.

C. Expense Ratio and Net Return

		<u>Net Return (%)</u>			
<u>Expense Category</u>	<u>Expense Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	
Low	0.88	12.77	3.64	4.70	
Middle	1.36	15.12	2.60	4.02	
High	1.91	14.02	1.01	3.49	

D. Turnover Ratio and Net Return

		<u>Net Return (%)</u>			
<u>Turnover Category</u>	<u>Turnover Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	
Low	40.92	14.47	2.43	4.07	
Middle	58.83	13.70	3.33	4.08	
High	124.63	13.68	1.51	4.06	

Table 3: Emerging Market Bond Funds

A. Gross Return

<u>Gross Return (%)</u>				
<u>Fund</u>				
<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
No-Load	40	17.43	8.65	12.02
Load	26	17.05	8.42	11.88
Statistically Different Gross Return?		No	No	No

B. Net Return

<u>Net Return (%)</u>						
<u>Fund</u>		<u>Expense Combined</u>				
<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Ratio</u>	<u>Load</u>
No-Load	40	16.37	7.59	10.96	1.05	
Load	26	15.44	6.81	10.27	1.61	3.15
		<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>		
Slope Coefficient (66 observations)		-2.42	-1.30	-1.29		
p Value		.004	.026	6.51E-05		
R ²		.12	.08	.22		
Slope Statistically Different from 0?		Yes	Yes	Yes		
Slope Statistically Different from -1?		No	No	No		

C. Expense Ratio and Net Return

<u>Net Return (%)</u>				
<u>Expense Category</u>	<u>Expense Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	0.87	16.85	7.58	11.10
Middle	1.19	15.90	7.69	10.80
High	1.75	15.28	6.59	10.17

D. Turnover Ratio and Net Return

<u>Net Return (%)</u>				
<u>Turnover Category</u>	<u>Turnover Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	39.68	17.91	7.98	11.19
Middle	87.05	14.62	7.45	10.47
High	128.64	15.50	6.44	10.41

Table 4: High Yield Bond FundsA. Gross Return

<u>Gross Return (%)</u>				
Fund				
<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
No-Load	266	18.57	6.96	8.71
Load	186	18.61	6.49	8.58
Statistically Different Gross Return?		No	No	No

B. Net Return

<u>Net Return (%)</u>							
Fund					Expense Combined		
<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Ratio</u>	<u>Load</u>	
No-Load	266	17.63	6.03	7.77	0.93		
Load	186	17.12	5.01	7.09	1.49	3.33	
			<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>		
Slope Coefficient (452 observations)			-0.75	-1.91	-0.98		
p Value			.008	7.03E-07	5.49E-09		
R ²			.02	.05	.07		
Slope Statistically Different from 0?			Yes	Yes	Yes		
Slope Statistically Different from -1?			No	Yes*	No		

*Not significantly different from -1 at a 98.5% level of significance.

C. Expense Ratio and Net Return

		<u>Net Return (%)</u>		
<u>Expense Category</u>	<u>Expense Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	0.74	17.58	6.14	7.83
Middle	1.07	17.68	6.22	7.92
High	1.67	17.00	4.48	6.73

D. Turnover Ratio and Net Return

		<u>Net Return (%)</u>		
<u>Turnover Category</u>	<u>Turnover Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	46.81	17.35	5.44	7.67
Middle	72.13	17.27	4.85	7.14
High	125.74	17.64	6.53	7.67

Table 5: Multisector Bond Funds

A. Gross Return

<u>Gross Return (%)</u>				
<u>Fund</u>				
<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
No-Load	77	15.31	7.49	8.85
Load	67	15.06	7.33	8.66
Statistically Different Gross Return?		No	No	No

B. Net Return

<u>Net Return (%)</u>						
<u>Fund</u>					<u>Expense</u>	<u>Combined</u>
<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Ratio</u>	<u>Load</u>
No-Load	77	14.40	6.59	7.95	0.90	
Load	67	13.57	5.84	7.17	1.49	3.26
Slope Coefficient (144 observations)			<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	
			-1.24	-1.08	-1.04	
p Value			.028	6.7E-05	.004	
R ²			.03	.11	.06	
Slope Statistically Different from 0?			Yes	Yes	Yes	
Slope Statistically Different from -1?			No	No	No	

C. Expense Ratio and Net Return

<u>Net Return (%)</u>				
<u>Expense</u>	<u>Expense</u>			
<u>Category</u>	<u>Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	0.76	14.74	6.84	8.23
Middle	1.08	14.06	6.20	7.50
High	1.69	13.23	5.68	7.02

D. Turnover Ratio and Net Return

<u>Net Return (%)</u>				
<u>Turnover</u>	<u>Turnover</u>			
<u>Category</u>	<u>Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	25.58	15.06	7.11	8.81
Middle	41.56	13.72	5.87	6.78
High	141.13	13.26	5.74	7.16

Table 6: Ultrashort Bond FundsA. Gross Return

		<u>Gross Return (%)</u>		
<u>Fund</u>				
<u>Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
No-Load	55	3.10	2.32	2.82
Load	21	3.66	2.65	3.06
Statistically Different Gross Return?		No	No	No

B. Net Return

		<u>Net Return (%)</u>			<u>Expense Combined</u>	
<u>Fund</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Ratio</u>	<u>Load</u>
No-Load	55	2.49	1.71	2.21	0.61	
Load	21	2.58	1.57	1.98	1.08	2.43
Slope Coefficient (76 observations)			<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	
			0.78	-0.88	-0.73	
p Value			.18	.048	.002	
R ²			.02	.05	.12	
Slope Statistically Different from 0?			No	Yes	Yes	
Slope Statistically Different from -1?			Yes	No	No	

C. Expense Ratio and Net Return

		<u>Net Return (%)</u>		
<u>Expense Category</u>	<u>Expense Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	0.40	2.49	2.14	2.49
Middle	0.70	2.27	1.36	2.01
High	1.13	2.79	1.52	1.94

D. Turnover Ratio and Net Return

		<u>Net Return (%)</u>		
<u>Turnover Category</u>	<u>Turnover Ratio</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Low	31.28	3.44	1.58	2.03
Middle	79.54	2.05	1.33	1.99
High	171.56	2.06	2.11	2.4

Table 7: World Bond Funds

<u>A. Gross Return</u>						
<u>Year</u>	<u>Gross Return(%)</u>					
	<u>Fund Category</u>	<u>N</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10</u>	
	No-Load	112	10.15	7.10	8.08	
	Load	67	9.88	7.15	8.22	
	Statistically Different Gross Return?		No	No	No	
<u>B. Net Return</u>						
<u>Fund Category</u>	<u>N</u>	<u>Net Return (%)</u>			<u>Expense Combined</u>	
		<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Ratio</u>	<u>Load</u>
No-Load	112	9.24	6.20	7.17	0.91	
Load	67	8.35	5.61	6.69	1.53	3.07
			<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	
	Slope Coefficient (179 observations)		-1.31	-0.96	-0.88	
	p Value		.004	.0002	.001	
	R ²		.04	.08	.06	
	Slope Statistically Different from 0?		Yes	Yes	Yes	
	Slope Statistically Different from -1?		No	No	No	
<u>C. Expense Ratio and Net Return</u>						
<u>Expense Category</u>	<u>Expense Ratio</u>	<u>Net Return (%)</u>				
		<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>		
Low	0.70	9.46	6.48	7.47		
Middle	1.05	8.97	5.97	6.89		
High	1.67	8.29	5.48	6.62		
<u>D. Turnover Ratio and Net Return</u>						
<u>Turnover Category</u>	<u>Turnover Ratio</u>	<u>Net Return (%)</u>				
		<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>		
Low	50.38	8.43	5.68	7.15		
Middle	94.73	9.18	5.89	7.58		
High	240.58	9.12	6.36	6.25		

Sales charges deducted from capital intended for investment are a deadweight loss--a cost penalty and unnecessary tax on economic value. They are not committed to the investment decision-making process, but rather reduce or stimulate the forfeiture of profits for bond fund shareholders who choose to travel on this toll road. Furthermore, load funds also have higher annual operating costs

(refer to the expense ratio data reported in Section B of Table 2 through Table 7), compounding the damage to wealth creation as the time frame of investing expands.

EXPENSES AND NET RETURN

Professional investment managers operate in competition with the efficient market hypothesis. They are enrolled in a challenging contest (performance derby) that demands that they repeatedly discover mispriced securities and purchase/sell these assets at prices that are beneficial to wealth creation.

In this highly competitive arena, costs of operating and trading play a decisive role in the outcome. Escalating costs compound into a brushfire that consumes the fertile, profitable opportunities that have been identified.

Efficient market theory predicts that there is an inverse relationship between a fund's annualized rate of return and its expense ratio. The initial test of this hypothesis employs bivariate regression analysis on the aforementioned data for all three time horizons and all six bond fund categories.

Consider Section B of Table 2 through Table 7. The slope coefficient is mathematically negative in 16 out of 18 (89%) regression analyses and is statistically negative in 16 of 18 (89%) regressions. Expenses decrease total return. The latter result indicates that there is less than a 5% probability that 16 of these 18 estimated slope coefficients is different from zero purely by chance.

The second investigation of the hypothesis that expenses and total returns are inversely related is strictly specified and therefore a much more demanding claim than the initial test. It asserts that expenses are a deadweight loss. An increase in the expense ratio results in a mathematically identical (one-to-one) reduction in net return. The null hypothesis states that the slope coefficients are statistically equal to negative one (-1).

The slope coefficient was statistically equal to negative one in 14 out of 18 (78%) regressions using a 95% confidence level. Increasing the confidence level to 98.5% or 99% improves the relationship to 16 out of 18 (89%). This empirical discovery that the expense ratio coefficient is repetitively indistinguishable from the hypothesized value of -1 is persuasively strong. In almost all tests, expenses inflicted approximately a one-to-one deadweight loss on bond funds' ultimate delivery of investment returns.

This conspicuously important empirical inference validates a fundamental message for investors and financial professionals: a below-average expense ratio provides a persistent advantage each year that increases the likelihood of an above-average net return.

A final issue demands empirical investigation. For bond funds classified in a particular category, do differences in expense ratios account for and explain differences in net returns?

The issue of the relationship between the net returns of bond funds and their operating expenses is examined further by segmenting each of the six fund categories into three sample groups, ranked by expense ratio.

The expense ratio data are ordered from lowest to highest, divided into thirds, and hereinafter designated the low-cost, middle-cost, and high-cost fund groups. The average expense ratio for each group in each category is computed in addition to the average annualized total return for time periods of three years, five years, and ten years.

In order to test this relationship, each of the six bond fund categories is divided into three groups of equal size and sorted and differentiated by their expense ratios. The average expense ratios for the high-cost, middle-cost, and low-cost groups are computed and compared with the calculated average net returns for each of the three groups for 3-year, 5-year, and 10-year time intervals.

The research issue under consideration is the degree to which lower expense ratios are linked with higher-return funds. More specifically, what is the degree of association and connection between higher expenses and lower returns?

Consider Section C of Table 2 through Table 7. The statistical linkage observed is very revealing. In 12 out of 18 (67%) observations the low-cost funds earned the highest average total return during 3-year, 5-year, and 10-year time periods.

Net total return decreased in 13 of 18 instances as the expense ratio increased from the low-cost group to the middle-cost group, in 16 of 18 instances as the expense ratio increased from the middle-cost group to the high-cost group, and in 16 of 18 instances as the expense ratio increased from low to high. Overall, rising expenses correlated with lower returns in 45 of 54 (83%) data sets. Investors can anesthetize their portfolio from performance deficits by astutely applying this information advantage.

Each of the results reported in this section on expenses and net return and in the preceding section on sales charges is consistent with efficient market theory. Expenses reduce net returns and constitute a deadweight loss. Furthermore, as costs increase, bond funds' performance increasingly deviates from a market rate of return.

Investors must be alert to the level of investment costs in order to avoid needlessly diminishing wealth-creation. The expected total return of lower-cost funds exceeds higher-cost funds and earns compounded returns as the investment time horizon expands. Financial planners should demonstrate due diligence by drafting a personalized investment policy document that communicates and substantiates the target allocations of stocks, bonds, and cash. It is imperative that they also provide value-added education for clients about the relationship between expenses and net returns, counseling clients not to invest in funds that extract high operating costs and sales charges. Investors and advisors can readily eliminate self-inflicted financial injury by bypassing these funds.

PORTFOLIO TURNOVER AND NET RETURN

The fifth and final hypothesis under review addresses the issue of portfolio asset turnover as a filtering strategy. Commissions, fees and bid/ask spreads are an additional thicket of costs confronted by mutual fund managers when they trade securities. These costs dissipate the power of compounding. Trading and transaction costs are not components of the expense ratio and should be scrutinized separately.

A basic contention of the efficient market hypothesis is that asset turnover activates a conspicuous cost of fund management that sacrifices net performance by inflicting a financial outlay borne by shareholders. Malkiel (2006) succinctly summarized this linkage: "low-turnover mutual funds have outperformed high-turnover mutual funds...The surest route to top-quartile performance is to buy funds with bottom-quartile turnover and expense ratios." Moreover, Malkiel asserted (2007, p. 379) "The two variables that do the best job in predicting future performance are expense ratios and turnover...The best-performing actively managed mutual funds have moderate expense ratios and low turnover." Analogously, Haslem (2003, p. 319) reports "Much of the long-term persistence in fund performance is due to persistence in expense ratios... Mutual fund expenses have at least a one-for-one negative impact on performance, and turnover also negatively impacts performance."

As validated above, mutual fund management fees and expenses are a persuasively effective indicator of bond fund performance. Another aspect to investigate is portfolio turnover.

Consider Section D of Table 2 through Table 7. In 8 out of 17 observations the low-turnover funds earned the highest average total return during 3-year, 5-year and 10-year time periods. In one case, total return earned was equal for two groups.

Net total return decreased in 13 of 18 instances as the degree of portfolio trading increased from the low-turnover group to the middle-turnover group, in 9 of 18 instances as turnover increased from the middle-turnover group to the high-turnover group, and in 11 of 17 instances (with 1 tie) as turnover increased from low to high. Overall, rising expenses correlated with lower returns in 33 of 53 (62%) data sets.

Additional examination of the hypothesis of an inverse relationship between portfolio performance and portfolio turnover was obtained from regression analyses of net returns and turnover ratios for each of the six categories and each of the three time intervals. The estimated slope coefficients were negative in 10 of 18 regressions and statistically negative 5 times; the slope coefficients were positive in 8 of 18 regressions and statistically positive 2 times.

Trading securities is expensive, a direct deduction from a fund's assets. In addition to commissions and possible market-impact costs, behavioral errors arise when trading securities. The emerging theory of behavioral finance reveals that investors (individual and professional) do not reliably implement investment decisions that are rational. This contention deviates from the coin of

the realm of economic and financial theory, namely the presumption that economic agents exhibit dependably rational behavior.

To cite one example from behavioral finance, households and fund managers are prone to trading based on recent market activity. This conduct "anchors" their buy/sell decision to criteria such as price momentum. This robotic, copycat tactic presents both opportunities (mispriced financial assets) and penalties (trading costs).

The data presented in Section D of Table 2 through Table 7 are moderately in accord with the declarations of Malkiel and Haslem, affirming that transaction costs generally reduce portfolio performance, and imparting mixed evidence that trading costs are a deadweight loss. This finding also supports Kinnel (2012) who reported little benefit to choosing lower-turnover taxable bond funds.

SUMMARY AND CONCLUSIONS

Operating expenses and fees charged by mutual funds are direct deductions against earned revenue and thus rupture net income by siphoning profits. But the relationship between costs and returns is imperfect. For example, some funds impose above-average costs but deliver above-average returns. The research presented herein investigated whether such occurrences are abnormal aberrations or routine results. The research results impart potent testimony in support of the hypothesis of the efficiency of the bond markets.

Once an asset allocation decision has been formulated, investors are more likely to profit (robust relative returns) by electing mutual funds charging low or restrained expense ratios that do not impose sales loads. Investors increase the probability of earning a lower rate of return by entrusting capital to higher-cost mutual funds. Lower expenses enable fund managers to be competitive in the investment performance derby without necessitating higher-risk strategies designed to overcome the performance deficit induced by the drag of transaction costs on net return.

Costs are a critical determinant of bond fund performance. During measurement periods of 3 years, 5 years, and 10 years, lower-cost funds tended to gravitate toward and be clustered among an Honor Roll bond funds that have earned satisfactory long-term returns.

Expenses prominently influence the ultimate total return delivered by mutual funds. However, many investors are unaware that the compounded erosion of returns precipitated by the operating expenses of mutual funds (particularly higher-cost funds) exerts a profound impact on fund performance. This research study has reinforced the principle that lower-cost bond funds outperform their more expensive peers over the long-term.

Mutual fund prospectuses, websites and promotional materials exhibit expense ratio data both in percentage terms and dollar values. It has become more difficult to conceal or camouflage expenses.

The empirical evidence and statistical barometers presented herein strongly affirm the financial scripture that low expenses play a crucial role by partially inoculating a fund from poor performance. Lower costs confer an enduring competitive advantage on bond funds. When assembling a portfolio, investors should concentrate their search for bond funds among the lower-cost funds and expand this due diligence by identifying funds within this subset whose net return exceeds the category average net return by an amount greater than their net annual expenses advantage.

Since exceeding a broad market index is a zero-sum contest before the deduction of financial intermediation costs, and an inferior outcome after withdrawing these investment expenses from the gross return, bond fund investors increase the probability of attaining their objectives by assiduously selecting investments from among the subset of low-cost funds.

The level of expenses is the best predictor of bond fund performance; expenses explain the bulk of the difference in relative performance. Investors and financial advisors can reduce the probability of sub par portfolio performance (and expand the odds of an above-average net return) by committing capital to funds that can authenticate economical expenses on their financial report card. Most higher-cost bond funds are suboptimal candidates and should be expunged from the roster of recommended funds. (This decision filter also disqualifies mutual funds that disguise their costs by exploiting the contrived marketing tactic—uncommon with bond funds—of a temporary absorption of some expenses in order to artificially boost their short-term rate of return.)

Concentrating financial capital among lower-costs funds is the antidote for the destruction of shareholder wealth that accompanies investment in funds that persistently extract high operating costs.

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