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# **Management Fee Provisions and Performance in the U.S. Mutual Fund Industry**

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## ABSTRACT

This paper examines the extent to which generous portfolio management compensation is commensurate to long-term mutual fund performance, over the course of five to ten years. If the relationship between the compensation provision and historical performance exists, the maximum percent management fees as disclosed on the fund prospectuses could be employed as a covariance factor for a model of portfolio pricing. The results indicate that there is relationship between portfolio net assets and this compensation provision. The results do not support the hypothesis that a relationship exists between the size of the maximum percent management fee and long term fund performance. This suggests that management compensation provisions are determined for reasons outside of the manager's history of results. Our evidence confirms that there are relations between aggregate portfolio expenses and diversification to fund performance.

*Keywords:* mutual fund fees, management expense fee

## INTRODUCTION

Portfolio manager compensation creates compelling discussion in the investment community. Much of this discussion cruxes upon the relationship of performance incentives – whether implicit or explicit, the manager’s compensation, and funds’ performance. By convention, most fund investors favor those with below-average expense ratios, and as such the industry has trended in this direction for many years. Evidence of this trend is published in the 2013 Investment Company Institute (ICI) Factbook, which reported a decline of greater than 20 percent in average expense ratios on an asset-weighted basis over a twenty year period. As that measure is asset-weighted, it removes the economies of scale factor. Further evidence:

In 1990, equity fund investors on average incurred expenses of 99 basis points—or 99 cents for every \$100 invested. By contrast, expense ratios averaged 77 basis points for equity fund investors in 2012. (Investment Company Institute, 2013)

In fact, equity funds with expense ratios in the lowest quartile managed 72 percent of equity funds’ total net assets. The downward pressure on expenses may be symptomatic of a market which prefers passive over actively managed funds. But, it also implies that mutual fund investors do not believe large management compensation fees have a relation to desired objective alignment, required return, and degree of risk aversion. Little existing empirical evidence examines the relationship between management fees and fund returns.

In this paper, we investigate if there is association between the maximum percent management fee as disclosed on the SAI, and the respective fund return, doing so cross-sectionally by fund objective. Otherwise stated, we examine if a generous compensation structure is warranting superior performance relative to peers sharing the same fund objective. Our paper serves to test the commonly accepted hypothesis that high quality portfolio managers are rewarded appropriately.

The paper is organized as follows. Section I discusses the industry practice surrounding management expense fees. Section II discusses prior research. Section III discusses our research methodology and linear models. Section IV discusses results. Section V discusses conclusions.

## I. INDUSTRY PRACTICE SURROUNDING MANAGEMENT EXPENSE FEES

There are many ways in which the mutual fund industry structures its management fee compensation plans. Details to the fees' composition can be found in the SEC Statement of Additional Information. We will examine these differences. The simplest model is a fixed salary, referred to as the collar. However, the most common fee structure includes a variable component called a performance fee, which rewards for excess returns beyond a contractual hurdle rate. The hurdle rate is commonly the benchmark return for open-ended funds, but typically based on the fund's assets under management (AUM) for closed-end funds. In the fund industry, the performance fee is preferable to an exclusive base collar because of contract theory. Investors prefer portfolio managers who are incentivized, as it provides for the alignment of interests (Drago, Lazzari & Navone, 2010). According to Ma, Tang, and Gomez (2013), "98% of our sample funds disclose that their portfolio managers have variable compensation (i.e., salary plus bonus) as opposed to fixed salaries" (p. 2). Figure 1 (below) is a graphic taken from the StatPro Group, a private firm which specializes in portfolio analysis. The graph taken demonstrates how the size of the performance fee is a function of the slope, namely the participation rate, which activates only after the hurdle rate has been achieved (Bacon, 2010). Note that the participation rate is a percent of the difference between either the AUM or the excess returns and the hurdle rate itself, not the total annualized change. However, the participation rate does reward for the total annualized return when the hurdle rate is a proxy for the risk-free-rate (Drago, Lazzari & Navone, 2010). The average evaluation period of performance fees are three years, on a rolling

window basis (Ma, Tang, & Gomez, 2013). Figure 1 demonstrates the most common compensation structure, an asymmetrical performance fee system (bonus plan). Alternatively, a symmetric structure (fulcrum fee) exists where management is punished for underperformance, as depicted in figure 2. Typically the collar is significantly lower on the asymmetric fee structure, which makes these structures more attractive to investors (Bacon, 2010).

Figure 1

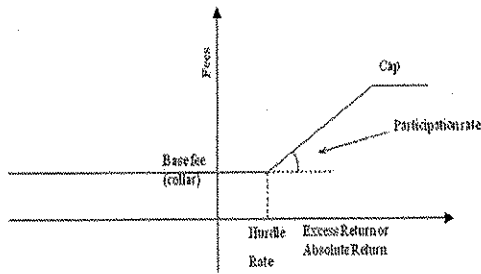
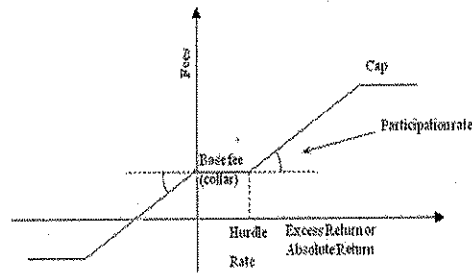


Figure 2



Similarly, participation rates, hurdle rates, and caps do vary greatly from fund to fund. Equation 1 (below) is the most representative model of the total management compensation. Likewise, percent management fees as reported on fund prospectuses and SAIs are modeled by equation 2.

$$(1) \quad (MF) = \begin{cases} C_0, & R_f < \text{Hurdle Rate} \\ C_0 + R_p(R_f - R_h - K), & \text{Cap Rate} > R_f \geq \text{Hurdle Rate} \\ C_1, & R_f > \text{Cap Rate} \end{cases}$$

Where MF is the total management fee expense.  $C_0$  is the base fee or collar, which is the focus of our study.  $R_p$  is the participation rate.  $R_f$  is the fund's realized and unrealized return on assets for the period.  $K$  is the return required to earn the right to the performance fee, which is often zero.  $C_1$  is a fixed component called the compensation cap, which can only be received by out earning a contracted compensation cap rate.

$$(2) \quad (\%MF) = \{MF / \text{Daily Average AUM}$$

%MF is the percent management fee expense. The numerator is the result of equation 1 and the denominator consists of the daily average net assets under management for the desired period of measure. It's important to note that in practicality, fund administrators determine the reported percent management fee (%MF) by application of a table disclosed on the fund's SAI. The table consists of downward-scaling percent values as the dependent variable, and tiers of change in net assets for the independent variable. The grading of these percentiles is downward to the growth of net assets. As such, an inverse relationship exists between growth of the total management fee expense and the reported percent management fee because of a denominator effect in equation 2. This inverse relationship is critical to understand as our study concerns the percent maximum management fee. Although the percent maximum management fee constitutes the highest compensation pro-rata of net assets, it is the lowest compensation a manager will receive on an absolute basis, due to the graded-scale. A research study committed by the SEC Division of Investment Management testifies to the existence of this inverse relationship:

In a sample of the 100 largest mutual funds, most funds have some type of fee breakpoint arrangement that automatically reduces the management fee rate as the asset-size of the individual fund or the fund family increases. Most funds in the sample with management fee breakpoints, however, have assets above the last breakpoint. (U.S. Securities Exchange Commission, 2000)

Further discussion of our research method will follow in section III.

## II. PRIOR RESEARCH

A study by Drago, Lazzari, and Navone (2010) examined the determinants and rationale behind performance fee incentives in the free contracting environment of the Italian mutual fund industry. The research incorporated a sample of 970 funds, managed by 51 various firms. More specifically, the study examined the generally accepted hypothesis that performance fees are an economically efficient solution to secure the best portfolio managers and align incentives in an asymmetric information environment. The study finds little support for the hypothesis and determined that:

They appear to emerge mainly as the product of strategic pricing by asset managers wishing to ease market competition, leverage on investors' sentiment, and hedge their cost structure. Alternatively, fears that managers may opportunistically alter funds' investment policies to maximize the option value embedded in the incentives provisions appear unjustified. (p. 1)

A study committed by Ma, Tang, and Gomez (2013), examined the compensation structures of portfolio managers. The research included a hand-picked selection of over 4,000 mutual funds' compensation structures. This research included the study of performance incentives' effect on performance, and the extent to which performance incentives are utilized in the United States mutual fund industry. The research findings supported the conclusion that performance-based compensation based on fund returns is correlated with better overall fund performance. Alternative performance structures, such as those which are based upon AUM have not shown significant correlation to fund performance.

Both of these studies were concerned primarily with the incentive fee component of management compensation, particularly examining the effectiveness of various pay structures and the extent to which they influence better fund returns. Our study expands upon this subject by examining the management fee structure as a whole, as opposed to the performance incentive



in isolation. Our examination of the maximum percent management fee provides a broader study, determining if greater overall compensation has correlation with better fund returns, relative to the fund categorization. Like prior studies, we were interested in finding causation of superior fund returns in connection to management compensation. Unlike prior studies, we examined if managers earning higher compensation outright execute better decisions, regardless of the explicit or implicit performance incentive component. Likewise, we examine the performance of funds which provide the smallest percent management fee. These funds are typically passive, following the underlying benchmark index. By examining the management fee as a whole we can move beyond discussion of agency conflict, opportunistic decision-making, interest-alignment, and competitive pricing, by way of testing the overarching hypothesis that fund administrators are paying portfolio managers commensurate to their performance expectations.

### III RESEARCH METHODOLOGY

Our reference universe consists of 6,357 mutual funds with inception dates of no earlier than 2002, providing us a 10 year period of data. Our data accounts for 5,831,823 million in assets, an average of 917 million AUM, managed by a total of 330 investment companies.

We built our database using the Value Line Mutual Funds Survey for Windows, a provider of one of the most comprehensive mutual fund screeners. Their database spans over 13,000 mutual funds. Value Line screening options included scores of performance metrics for a variety of reference periods. They are also the only screener that we know to provide the maximum percent management fee. The screener provided us with confidence in the reliability of the data as it is updated on a monthly rolling basis.

When determining our fund universe, we eliminated objective categories such as emerging markets, European equity, foreign equity, global, international bond, and pacific equity. In doing

so, the investment companies in our analysis should have invested the majority of assets in the United States securities markets. Similarly, we eliminated funds chartered outside of the United States. This provides our regressions with comparable observations.

Our fund universe utilizes 38 of Value Line's fund objectives. For the purposes of our research we condensed these into eight categories. Refer to Table 1 on the following page. When determining our categorization, we combined value and blend equity categorizations with growth, and labelling it as such. Our rationale in doing so is that both investing strategies have the end-goal of meeting or beating the S&P 500 benchmark. Furthermore, these investment strategies spanned multiple Value Line categories which, if left unconsolidated, would have diluted our regression samples.

It's important to note we've eliminated category 5, Large Cap, from our research. The category accounted for 2,282 observations. These observations were already accounted for within categories 1,2,4,6,7, and 8 because Category 5 is a subgroup of them. Including category 5 would have resulted in redundant sampling. Total observations would not equal the sample size. We are uncertain as to why Value Line Mutual Fund Survey stratifies it this way, especially because category 6, Small Cap, stands for itself. This could potentially be oversight in their database. Category 5 is intentionally omitted and unsubstituted because it's a significant departure from the consistency of the sample. However we included the category's regression data in the very last section of the appendix.

We consolidated Value Line fixed income objectives, despite their varied end-goals and benchmarks. Our rationale for doing so is primarily for efficiency, and because the majority of high maximum percent management fees in fixed income are a product of high-yield funds. By consolidating all to a fixed income as a group, the regression sample is provided the

heterogeneity necessary for a regression model. Munis funds were separated from the group because of their investment goal and objective is intrinsically different from other fixed income.

Table 2 provides the number and share of sample observations and respective AUM.

Table 1)

Code	Objective Name	Our Label	Obj/Pec
0	UNLABELLED		
1	ASSET ALLOCATION	Balanced	AA
1	BALANCED	Balanced	BA
1	FLEXIBLE	Balanced	FL
2	ADJUSTABLE RATE	Fixed Income	AJ
2	AAA	Fixed Income	CG
2	HIGH YIELD	Fixed Income	CH
2	CONVERTIBLE	Fixed Income	CV
2	DIVERSIFIED BOND	Fixed Income	DB
2	GOVT MORTGAGE	Fixed Income	GM
2	GOVT	Fixed Income	GS
2	HIGH YIELD	Fixed Income	HY
2	INCOME	Fixed Income	IN
2	INSURED	Fixed Income	IS
2	INTERMEDIATE TERM	Fixed Income	IT
2	SHORT TERM	Fixed Income	ST
3	MUNI NATIONAL	Fixed Income Munis	MB
3	MUNI CALI	Fixed Income Munis	MC
3	MUNI SINGLE STATE	Fixed Income Munis	MS
3	MUNI NY	Fixed Income Munis	MY
4	GROWTH	Growth	AG
4	GROWTH	Growth	GR
4	GROWTH	Growth	GW
X	LARGE CAP BLEND		LB
X	LARGE CAP GROWTH		LG
X	LARGE CAP VALUE		LV
6	SMALL CAP BLEND	Growth Small Cap	SB
6	SMALL COMPANY	Growth Small Cap	SC
6	SMALL CAP GROWTH	Growth Small Cap	SG
6	SMALL CAP VALUE	Growth Small Cap	SV
7	GROWTH/INCOME	Growth/Income	GI
8	ENERGY/NATURAL RESOURCES	Sectors	EN
8	FINANCIAL SRVCE	Sectors	FS
8	HEALTH	Sectors	HL
8	OTHER SPECIALTY	Sectors	OT
8	PRECIOUS METAL	Sectors	PM
8	REAL ESTATE	Sectors	RE
8	TECHNOLOGY	Sectors	TC
8	UTILITIES	Sectors	UT
X	EMERGING MARKETS		EM
X	EUROPEAN EQUITY		EU
X	FOREIGN EQUITY		FO
X	GLOBAL		GL
X	INTERNATIONAL BOND		IB
X	JAPAN		JP
X	NON JAPAN		NJ
X	PACIFIC EQUITY		PB

Table 2)

Group	Label	Observations	Percent	Total AUM (millions)	Percent
1	Balanced	624	10%	691,957	12%
2	Fixed Income	1513	24%	1,762,177	30%
3	Fixed Income Munis	978	15%	482,973	8%
4	Growth	1519	24%	1,164,348	20%
6	Growth Small Cap	739	12%	391,056	7%
7	Growth/Income	491	8%	1,124,376	19%
8	Sectors	493	8%	214,936	4%
		6357	100%	5,831,823	100%

To test our hypothesis that portfolio managers are compensated commensurate to their long-term performance, we developed several linear regression models to test the relationship. We created a new factor, modeled by  $\phi$ , to alter the CAPM model. Equations are as follows:

$$(3) \quad \phi = \frac{COV(m_a, m_b)}{VAR(m_b)}$$

$$(4) \quad E(R_i) = R_f + \beta_i \phi_i (E(R_m) - R_f)$$

Equation 3 is the expression used to represent the hypothesis. Where  $m_a$  is the maximum percent management fee, as referenced in equation 2, and  $m_b$  is the average maximum percent management fee charged by funds in the same category and applying the same underlying benchmark index. The equation is the same model that determines  $\beta$ , beta, in sensitivity analysis.

In equation 4, we took the CAPM model, and modified it with our new  $\phi$  factor. Where  $E(R_i)$  is the expected return on the fund portfolio.  $R_f$  is the risk-free-rate of interest.  $\beta_i$  is the sensitivity of the portfolio's expected returns to the benchmark's expected return.  $E(R_m)$  is the expected return on the market, and the expression  $(E(R_m) - R_f)$  represents the market risk premium. Generally, the CAPM model assumes that the portfolio has eliminated unsystematic risk because of diversification, hence the use of beta to account for the appropriate measure of systemic risk. Note that under the original CAPM model and the present altered form of equation 4, an investor's required return should price in the fund expenses as that is accounted for under the market risk premium. The market risk premium varies from investor to investor based on risk tolerance and investing style, and the CAPM model is essentially the cost of capital. Our alteration using  $\phi$  stands a significant modifier because we are signaling that the fund return is not just in part the investor's expense preferences, but also in part a function of how generous the compensation structure is.

To test the validity of the above equations, we produced several linear regressions to analyze the likelihood of  $\phi$  correlation to fund returns. Microsoft Excel's Data Analysis Pack provided the results. Analysis did not necessitate the need for dummy variables because of our decision to decompose into several regressions. Assume the maximum percent management fee is the independent variable when no other is mentioned. The tests are as follows:

I) Load Adjusted Return versus Maximum Management Fee:  $LAR = a + b(\%MF)$

Load Adjusted Return (LAR) is the dependent variable. Its reference period is segmented as follows: 'Since Inception', '10 Years', '5 Years', '1 Year'. This is the most direct method to validate our suggested hypothesis.

II) Beta 5 Years versus Maximum Management Fee:  $\beta = a + b(\%MF)$

This test examines whether compensation size may influence the degree to which portfolio managers align or wander from the underlying benchmark.

III) Alpha 5 Years versus Maximum Management Fee:  $\alpha = a + b(\%MF)$

This test examines whether compensation size influences the value a portfolio manager adds to a fund. This variable may serve as a better test than test I because of its specificity.

IV) Load Adjusted Return versus Multi-variable Costs:

$$LAR = a + b(Load_{max}) + c(RedFee) + d(12B1) + e(\%MF)$$

Load Adjusted Return is the dependent variable. Its reference period is segmented as follows: '10 Years', '5 Years'. Independent variables comprise of: Maximum Load Charge, Redemption Fee, 12B-1 Fee, Maximum Management Fee. This test examines the hypothesis that funds' cost structure is inversely related to returns.

V) 1 Year Load Adjusted Return versus Turnover Ratio:  $LAR = a + b(\text{Turnover})$

1 Year Load Adjusted Return is the dependent variable. The turnover ratio is the independent variable. This test provides insight as to the effect transaction frequency has on performance. It may suggest whether compensating portfolio managers highly is merited. Only a 1 year reference period can be applied in this test because the turnover ratio is an annual measure.

VI) 5 Year Load Adjusted Return versus 5 Year Sharpe Ratio:  $LAR = a + b(\text{Sharpe})$

5 Year Load Adjusted Return is the dependent variable. The Sharpe ratio is the independent variable. The test will serve as reference to understand the extent to which portfolio managers will assume excess risk, applying a 5 year reference period.

VII) Fund Size versus Maximum Management Fee:  $NA = a + b(\%MF)$

Net Assets is the dependent variable. The test should provide insight as to the extent economies of scale influence the compensation structure.

VIII) Load Adjusted Return versus Expense Ratio:  $LAR = a + b(MER)$

Load Adjusted Return is the dependent variable. Its reference period is segmented as follows: '1 Year', '5 Years'. Expense Ratio is the independent variable. This test examines how operating efficiency may in affect fund performance. An inverse correlation could imply that high management fees are mostly unwarranted.

We chose our dependent variable in most tests to be the Load-Adjusted Return because it's the most organic measure of a fund's performance, because the measure downward adjusts returns for sales loads, the 12b-1 fee, and the management fee.

#### IV RESULTS

Only results which we define as statistically significant are explained. Our definition of statistical significance must include the following qualifications: i)  $t \text{ stat} \geq 2$ , ii)  $P\text{-value} \leq 5\%$ , iii)  $\text{Adjusted R-Square} \geq .07$ . These thresholds were determined by our judgment to be reasonable, albeit the Adjusted R-Square is a very low hurdle. All regression results are provided in the appendix.

Test I) 23 of the 28 regressions resulted in qualifying  $t$  stats values. Overall, this suggests that generous management compensation is potentially driver of superior fund performance.

Similarly, these regressions'  $P$ -values were very close to zero, suggesting little support for the null-hypothesis. However, in many regressions the management fee coefficient provided a negative slope. This is observed in predominantly equity categorizations: growth, sectors, growth/income, and balanced. As such, it suggests that higher management compensation in fact drives lower returns.

Additionally, 25 of the regressions failed to qualify the Adjusted R-Square threshold. A low coefficient of determination suggests high variability between management compensation and the return. Therefore, the regressions provide little explanation for the relationship as the line of fit holds little predictive value.

Of the categories we tested, fixed income was statistically significant at the 10 and 1 year reference period. Growth/Income qualified at the 5 year reference period. We deem these as insignificant because the overall test has provided little explanatory power of a relationship.

Test II) None of the seven regressions qualified as statistically significant because of failure to make the Adjusted R-Square threshold. Like test 1, a qualifying  $t$  stat and  $P$ -value on six of the

seven regressions suggests that generous management compensation is potentially a driver for higher beta. But this is refuted by evidence of near-zero coefficients, some negative, and some positive. The results of this test are overall similar to the prior in that high variability between maximum management fee and Beta values provide for little correlation. This test supports the null hypothesis that manager compensation does not influence decisions to follow or break from underlying portfolio benchmarks. The lack of predictive trends can be explained by further stratification within our seven categories. Many funds use different benchmarks for which Beta is calculated and not just the commonly accepted S&P 500 index. Within an equity category such as Growth/Income or Small Cap, some funds may demonstrate either low or high Beta by the inherent nature of their investing strategy.

It's notable that although excluded from our research for reasons expressed in the prior section, category 5 large cap, qualified by our definition as statistically significant. However, we deem this finding statistically insignificant because of the tendency for R square to be artificially raised by high observation values. This category consists of the highest observation set of 2,282. Test III) Six categories failed to meet the R square threshold. Four of the seven categories failed to qualify the t stat and P-value thresholds. The coefficients of the categories were similarly unpredictable, but of larger values. For example, the munis fund regression determined a max management fee's coefficient of -2.61, a steep inverse slope. This counterintuitively suggests that greater compensation plans provide poorer quality portfolio management, as such is signaled by our dependent variable, alpha factor. The coefficient was 3.17 for fixed income for which there is no logical explanation for this sign difference.

Category 7, Growth/Income qualified as statistically significant. Its coefficient of -3.61 is much steeper than in prior tests, which suggests management fee size strongly affects the fund's



alpha factor. But we deem category 7 as statistically insignificant because of the conflicting slopes between the various categorizations. Ultimately the null hypothesis that alpha and management fee have no correlation is supported.

Test IV) Ten of the fourteen regressions failed to meet the R square threshold. Category 7 with reference periods of 10 and 5 years qualified, as did Category 3 at 10 years, and 2 at 10 years. The overall t stat and P-value data qualified for the various expenses. Broadly the expense coefficients provided slopes that were near zero. The stronger regressions were those with 10 year reference periods, as they provided negative slopes which are consistent with the hypothesis fund expenses negatively impact returns. The lesser 5 year periods are likely an insufficient period to support the inverse relationship between fund expenses and returns.

We noted the F-stat values ranged from 1.8 to 47 on these multi-variable regressions, with uniformly zero significance F factors. This suggests a wide degree to the extent which all fund expenses together have an effect on fund returns. Discussion of the statistically significant categories follows. Category 7, which is growth/income, had F-stat factors of 18 and 14 for its five and ten year reference periods, respectively. Category 3, munis, had a stronger F-stat of 27 and Category 2, fixed income, had the highest of 47.

The overall consistency in ten year expense coefficients, coupled with statistically significant categories lead us to concede to the validity of the fund expenses hypothesis.

Test V) Category 2, fixed income, is the only regression of seven to pass the R square, t stat, and P-value thresholds and as such is statistically significant. However, the turnover ratio coefficient is near zero in all seven regressions. The result of test V supports for the null hypothesis, that a portfolio manager's decision to commit high transaction frequency has no correlation to its return. This finding is unusual; as the investment community generally accepts the notion that a

high portfolio turnover suggests inefficiencies and reduced fund returns relative to peers. It's important to note that the reference period of this test was only 1 year.

Test VI) The test determined that all 5 year load adjusted returns are positively correlated to the Sharpe ratio. The only categories which failed to be statistically significant are groups 2 and 3, which are fixed income and munis, respectively. The correlation suggests that a greater 5 year load adjusted return is directly proportionate to how well diversified the portfolio is. While this test has proven statistical significance and is a proven principle of investing, it serves little for the purpose to our paper. If this test was repeated again, a multivariable analysis that included management fee would have been more appropriate in linking the test for purposes of our analysis.

Test VII) Fund categories 3, 7, and 8 qualified as statistically significant. Those categories are munis, growth/income, and sectors, respectively. Five of eight regressions did not qualify because of the adjusted r square threshold. However, all regressions demonstrated strong t-stats. The weakest t-stat is -2.13, as demonstrated by category 1, balanced. Most t-stats had magnitudes greater than -4. P-values were near zero for all regressions.

We also had committed a regression to all fund categories, spanning the complete 6,357 observations. This regression had a strong t-value of -10.48 and P-value of near zero; however it did not provide the r square correlation coefficient we seek as it was only .0168. Regardless, the regression exhibited a very steep inverse slope coefficient. According to this regression's line of best fit, for every 1% rise in the maximum management fee the net assets would drop 2,278 million.

The test demonstrates the extent to which economies of scale dominate in the mutual fund industry. Larger firms, possessing greater net assets, can compensate managers at lower

percentages of net asset changes. More importantly, this relationship implies that the maximum percent management fee may not be the best measure for the purpose of our paper. By examining the maximum percent management fee, we are essentially analyzing a contractual provision. The measure is more directly examined by total compensation paid data which is disclosed on a fund's proxy statement.

Test VIII) Categories 3 and 7, which are munis and income/growth, qualified as statistically significant. The reference period of these qualified regressions were 1 year, 5 years, for category 7 and 1 year for category 3. Eleven of the fourteen regressions failed to qualify as statistically significant because of low R squared values. We deemed all 1 year regressions as statistically insignificant because of wide variability in the independent slope, the management expense ratio coefficient, ranged widely from positive and negative figures. The reference period is too small to provide reliable regression data which accounts for the cross-category inconsistency. This leaves the test with only one statistically significant regression

With respect to regressions with 5 year reference periods, like prior tests, the t-stat values and P-values exceeded the thresholds. However, the MER coefficient was fairly low, indicative of little trend and predictive value for the 5 year reference period regressions. The largest coefficient was -1.57, belonging to the growth category. The regression implies that for as the operating expenses to AUM ratio increases 1%, the 5 year load-adjusted annualized return of will drop 1.57%, according the line of best fit. While most of the results failed to be statistically significant, the test suggests validity that an inverse relationship exists between MER, and thusly management fee provisions, to fund returns.

## V CONCLUSIONS

The regression analysis committed has provided little support that portfolio managers are compensated commensurately to their history of performance. Likewise, there is no evidence suggesting that our model's  $\phi$  factor, representing management fee covariance, could be integrated into the capital asset pricing model. The null hypothesis which consists that the provisional maximum percent management compensation and fund performance are uncorrelated stands. Our examination of the subject was could have improved in several areas:

- 1) Broadly defined categorizations comprised funds of differing sub-objectives. These funds track different benchmarks and possess varying sub-objectives within the categories set. The lack of stratification created incomparability of fund returns within our designated category, contributing to the very low adjusted R square values. It is possible stronger statistical analysis could have been achieved by further segmentation as funds data points would consolidate closer the line of best fit. Additionally, the exclusion of fund category 5 added unnecessary heterogeneity to the regressions as these observations were included in all other equity categorizations.
- 2) The independent variable maximum percent management expense provided our study research into the relationship between generous contractual provisions. The magnitude of that provision is determined by fund administrators and directors. Ultimately our study analyzed these parties' perception of a portfolio managers worth, which is an accurate means to test our hypothesis. However, a method which could provide greater statistical significance would be to analyze total compensation of managers as directly disclosed on fund proxy statements. This is because the maximum percent management fee varies inversely with fund size.

3) The study did not take into account rollover in the position of portfolio manager.

Research assumes the same portfolio manager has managed the funds since inception.

4) Management fee provisions have a wide variety of structures. While closed ended funds may apply the fee on basis of NAV change, open ended funds may use alternative measures. Our study included passive index strategy funds as well. Many of these funds do not charge a management fee.

Research did support the hypothesis that an inverse relationship exists between aggregate fund expenses and MER to the fund's performance. However it did not support the commonly accepted notion that high turnover implies poor fund performance. We assert this anomaly is the result of statistical insignificance resulting from the lack of stratification.

Despite reaching different conclusions concerning performance incentives, the research committed by Drago, Lazzari, and Navone (2010) and Ma, Tang, and Gomez (2013) provided strong statistical significance because of their stratification, and choice to examine one component of the management fee structure. This study would greatly benefit from a similar methodology.

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**Load Adjusted Return versus Maximum Management Fee**

Load Adjusted Return is the dependent variable. The variable is segmented as follows: 'Since Inception', '10 Years', '5 Years', '1 Year'.

Maximum Management Fee is the independent variable. All regressions are indexed in column A in the following format: [Fund Category]-[Return Timespan]

**Inception**

Regression Statistics	
Multiple R	0.114955939
R Square	0.013214868
Adjusted R Square	0.011628397
Standard Error	2.500597167
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	52.08564943	52.08564943	8.329724044	0.004035437
Residual	622	3889.357411	6.252986192		
Total	623	3941.443061			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.310103097	0.164195809	32.3400648	2.4064E-135	4.987657792	5.632548401	4.987657792	5.632548401
X Variable 1	0.954107818	0.330584242	2.886126131	0.004035437	0.304911367	1.603304269	0.304911367	1.603304269

**1-10Yr**

Regression Statistics	
Multiple R	0.012550303
R Square	0.00015751
Adjusted R Square	-0.001449954
Standard Error	2.10599641
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.43459273	0.43459273	0.097986716	0.754364092
Residual	622	2758.707388	4.435220881		
Total	623	2759.141981			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.588719142	0.138285282	40.41441771	3.9394E-176	5.317156548	5.860281736	5.317156548	5.860281736
X Variable 1	-0.087152458	0.278417186	-0.3130283	0.754364092	-0.633904016	0.459599099	-0.633904016	0.459599099

**1-5Yr**

Regression Statistics	
Multiple R	0.007908829
R Square	6.25496E-05
Adjusted R Square	-0.001545067
Standard Error	2.524858823
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.248036832	0.248036832	0.038908275	0.843694931
Residual	622	3965.195311	6.374912076		
Total	623	3965.443348			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.318133272	0.165788893	26.04597443	1.0893E-101	3.992559492	4.643707052	3.992559492	4.643707052
X Variable 1	-0.065841012	0.333791684	-0.197251806	0.843694931	-0.721336192	0.589654167	-0.721336192	0.589654167

## 1-1Yr

Regression Statistics	
Multiple R	0.036248029
R Square	0.00131392
Adjusted R Square	-0.000291685
Standard Error	5.537783258
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	25.09585974	25.09585974	0.818333199	0.366018191
Residual	622	19074.901	30.66704341		
Total	623	19099.99686			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	8.691503994	0.363625462	23.90235254	4.58336E-90	7.977421681	9.405586307	7.977421681	9.405586307
X Variable 1	0.662276663	0.732106675	0.904617709	0.366018191	-0.775423613	2.09997694	-0.775423613	2.09997694

## 2Inception

Regression Statistics	
Multiple R	0.113624428
R Square	0.012910511
Adjusted R Square	0.012257242
Standard Error	2.171749936
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	93.21182069	93.21182069	19.76293109	9.40648E-06
Residual	1511	7126.628153	4.716497785		
Total	1512	7219.839974			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.613149443	0.164309598	28.0759585	6.2912E-140	4.29085038	4.935448506	4.29085038	4.935448506
X Variable 1	1.51477002	0.340738355	4.445551831	9.40648E-06	0.846399734	2.183140305	0.846399734	2.183140305

## 2-10Yr

Regression Statistics	
Multiple R	0.319500547
R Square	0.1020806
Adjusted R Square	0.101486345
Standard Error	2.057016387
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	726.851725	726.851725	171.7790998	2.99293E-37
Residual	1511	6393.519104	4.231316416		
Total	1512	7120.370829			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.32302734	0.155629122	14.92668799	4.21957E-47	2.017755336	2.628299343	2.017755336	2.628299343
X Variable 1	4.229939134	0.322737148	13.1064526	2.99293E-37	3.596878851	4.862999417	3.596878851	4.862999417



2-5Yr

Regression Statistics	
Multiple R	0.157005568
R Square	0.024650748
Adjusted R Square	0.024005249
Standard Error	2.743780205
Observations	1513

## ANOVA

	df	SS	MS	F	Significance F
Regression	1	287.4968264	287.4968264	38.18865985	8.24368E-10
Residual	1511	11375.30634	7.528329811		
Total	1512	11662.80317			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.33009746	0.20758809	16.04185221	1.3405E-53	2.92290611	3.737288811	2.92290611	3.737288811
X Variable 1	2.660282349	0.430487479	6.179697391	8.24368E-10	1.815865997	3.504698701	1.815865997	3.504698701

2-1Yr

Regression Statistics	
Multiple R	0.332246663
R Square	0.110387845
Adjusted R Square	0.109799088
Standard Error	6.811205174
Observations	1513

## ANOVA

	df	SS	MS	F	Significance F
Regression	1	8698.271033	8698.271033	187.4929794	2.56819E-40
Residual	1511	70099.09156	46.39251592		
Total	1512	78797.36259			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-6.255677579	0.515320094	-12.13940161	1.99958E-32	-7.266496094	-5.24485906	-7.266496094	-5.244859063
X Variable 1	14.63280798	1.068649208	13.69280758	2.56819E-40	12.53661491	16.72900104	12.53661491	16.72900104

3Inception

Regression Statistics	
Multiple R	0.111445829
R Square	0.012420173
Adjusted R Square	0.011408308
Standard Error	1.226676842
Observations	978

## ANOVA

	df	SS	MS	F	Significance F
Regression	1	18.46994391	18.46994391	12.27454052	0.000480012
Residual	976	1468.622408	1.504736074		
Total	977	1487.092352			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.783727775	0.178741111	21.16876054	3.78904E-82	3.432966656	4.134488894	3.432966656	4.134488894
X Variable 1	1.402253494	0.400243151	3.503504035	0.000480012	0.616817313	2.187689674	0.616817313	2.187689674

3-10Yr

Regression Statistics	
Multiple R	0.17643724
R Square	0.031130099
Adjusted R Square	0.030137405
Standard Error	0.764654944
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	18.33563114	18.33563114	31.35919186	2.78737E-08
Residual	976	570.6644507	0.584697183		
Total	977	589.0000818			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.370922576	0.111419136	21.27931212	7.58186E-83	2.152273935	2.589571216	2.152273935	2.589571216
X Variable 1	1.397145622	0.249493504	5.599927844	2.78737E-08	0.907540179	1.886751065	0.907540179	1.886751065

3-5Yr

Regression Statistics	
Multiple R	0.176464722
R Square	0.031139798
Adjusted R Square	0.030147113
Standard Error	0.9816808
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	30.2304831	30.2304831	31.36927583	2.77338E-08
Residual	976	940.5684614	0.963697194		
Total	977	970.7989445			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.707974938	0.143042333	18.93128341	2.53703E-68	2.427269014	2.988680862	2.427269014	2.988680862
X Variable 1	1.793974585	0.320305237	5.600828138	2.77338E-08	1.16540837	2.422540799	1.16540837	2.422540799

3-1Yr

Regression Statistics	
Multiple R	0.146196337
R Square	0.021373369
Adjusted R Square	0.020370678
Standard Error	1.546547927
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	50.98383932	50.98383932	21.31600288	4.41472E-06
Residual	976	2334.40704	2.391810492		
Total	977	2385.390879			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-3.304364672	0.225350056	-14.66325208	3.81469E-44	-3.746591071	-2.86213827	-3.746591071	-2.862138274
X Variable 1	-2.329753704	0.504611479	-4.616925695	4.41472E-06	-3.320002037	-1.33950537	-3.320002037	-1.33950537

## 4Inception

Regression Statistics	
Multiple R	0.07954552
R Square	0.00632749
Adjusted R Square	0.005672465
Standard Error	4.218239225
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	171.8842848	171.8842848	9.659925116	0.001918287
Residual	1517	26992.80346	17.79354216		
Total	1518	27164.68774			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.281212607	0.302097253	24.10221392	6.1752E-109	6.688640084	7.87378513	6.688640084	7.87378513
X Variable 1	-1.321059527	0.425045583	-3.108042007	0.001918287	-2.154798766	-0.48732029	-2.154798766	-0.487320288

## 4-10Yr

Regression Statistics	
Multiple R	0.091380943
R Square	0.008350477
Adjusted R Square	0.007696786
Standard Error	3.277999146
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	137.2638946	137.2638946	12.77434511	0.00036241
Residual	1517	16300.58734	10.7452784		
Total	1518	16437.85123			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.706794007	0.234760165	32.82837192	4.9428E-179	7.246305135	8.16728288	7.246305135	8.16728288
X Variable 1	-1.180544766	0.330303471	-3.574121586	0.00036241	-1.828444605	-0.53264493	-1.828444605	-0.532644928

## 4-5Yr

Regression Statistics	
Multiple R	0.110216768
R Square	0.012147736
Adjusted R Square	0.011496548
Standard Error	4.170686184
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	324.4919666	324.4919666	18.65472807	1.66825E-05
Residual	1517	26387.64347	17.39462325		
Total	1518	26712.13543			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.390740053	0.298691651	21.39577733	5.68326E-89	5.804847717	6.976632389	5.804847717	6.976632389
X Variable 1	-1.815123905	0.420253961	-4.319111954	1.66825E-05	-2.639464237	-0.99078357	-2.639464237	-0.990783573

4-1Yr

Regression Statistics	
Multiple R	0.131475855
R Square	0.017285901
Adjusted R Square	0.0166381
Standard Error	7.95103196
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1686.931323	1686.931323	26.68396756	2.71389E-07
Residual	1517	95903.08531	63.21890923		
Total	1518	97590.01663			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	19.79697007	0.569428328	34.76639479	2.8496E-195	18.68001989	20.91392026	18.68001989	20.91392026
X Variable 1	-4.138595706	0.80117576	-5.165652675	2.71389E-07	-5.710125195	-2.56706622	-5.710125195	-2.567066217

6Inception

Regression Statistics	
Multiple R	0.08996298
R Square	0.008093338
Adjusted R Square	0.006747467
Standard Error	3.136973475
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	59.17605906	59.17605906	6.013458888	0.014428047
Residual	737	7252.524103	9.840602583		
Total	738	7311.700162			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.56925483	0.407064034	18.59475216	1.4146E-63	6.770111599	8.36839806	6.770111599	8.36839806
X Variable 1	1.247215587	0.508603514	2.452235488	0.014428047	0.248731267	2.245699907	0.248731267	2.245699907

6-10Yr

Regression Statistics	
Multiple R	0.010720871
R Square	0.000114937
Adjusted R Square	-0.001241759
Standard Error	2.448010031
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.507696231	0.507696231	0.084718363	0.77108412
Residual	737	4416.659043	5.992753111		
Total	738	4417.166739			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	9.099681936	0.317661863	28.64581176	7.0835E-122	8.476051975	9.723311896	8.476051975	9.723311896
X Variable 1	-0.115523538	0.396900552	-0.29106419	0.77108412	-0.894713942	0.663666867	-0.894713942	0.663666867

6-5Yr

Regression Statistics	
Multiple R	0.019748976
R Square	0.000390022
Adjusted R Square	-0.000966301
Standard Error	3.427596678
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	3.378356742	3.378356742	0.287558415	0.59195123
Residual	737	8658.584791	11.74841898		
Total	738	8661.963148			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.869414812	0.44477626	17.692974	1.19317E-58	6.996235391	8.742594233	6.996235391	8.742594233
X Variable 1	-0.298003431	0.55572281	-0.536244734	0.59195123	-1.388991788	0.792984927	-1.388991788	0.792984927

6-1Yr

Regression Statistics	
Multiple R	0.088987631
R Square	0.007918798
Adjusted R Square	0.006572691
Standard Error	6.891656376
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	279.4002464	279.4002464	5.882738652	0.015529208
Residual	737	35003.76165	47.49492761		
Total	738	35283.16189			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	22.93593591	0.894284083	25.64725947	3.4818E-104	21.18028812	24.6915837	21.18028812	24.6915837
X Variable 1	-2.710078698	1.11735744	-2.425435765	0.015529208	-4.903661425	-0.51649597	-4.903661425	-0.51649597

7Inception

Regression Statistics	
Multiple R	0.151772572
R Square	0.023034914
Adjusted R Square	0.02103703
Standard Error	2.771475689
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	88.56019198	88.56019198	11.5296574	0.000740711
Residual	489	3756.046896	7.681077496		
Total	490	3844.607088			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	8.058085624	0.295482283	27.27096036	3.07E-100	7.477514033	8.638657215	7.477514033	8.638657215
X Variable 1	-1.813940424	0.53421345	-3.395534921	0.000740711	-2.863577477	-0.76430337	-2.863577477	-0.764303371

7-10Yr

Regression Statistics	
Multiple R	0.178486677
R Square	0.031857494
Adjusted R Square	0.029877652
Standard Error	1.569421587
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	39.63331704	39.63331704	16.09093119	6.982E-05
Residual	489	1204.448133	2.463084117		
Total	490	1244.08145			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.337143931	0.167324677	43.8497422	1.4442E-171	7.008379875	7.665907986	7.008379875	7.665907986
X Variable 1	-1.213483723	0.302512529	-4.011350295	6.982E-05	-1.807868532	-0.61909891	-1.807868532	-0.619098913

7-5Yr

Regression Statistics	
Multiple R	0.311547456
R Square	0.097061817
Adjusted R Square	0.095215318
Standard Error	3.080446325
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	498.8001224	498.8001224	52.56531359	1.63701E-12
Residual	489	4640.194136	9.489149562		
Total	490	5138.994258			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.515906895	0.328423344	22.88481328	2.4766E-79	6.870611816	8.161201974	6.870611816	8.161201974
X Variable 1	-4.304939181	0.593768823	-7.250194038	1.63701E-12	-5.471592244	-3.13828612	-5.471592244	-3.138286118

7-1Yr

Regression Statistics	
Multiple R	0.108153364
R Square	0.01169715
Adjusted R Square	0.009676081
Standard Error	5.456025799
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	172.2866816	172.2866816	5.787604899	0.016509802
Residual	489	14556.65837	29.76821752		
Total	490	14728.94505			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	19.8607322	0.581696951	34.14274763	1.5494E-131	18.71779828	21.00366612	18.71779828	21.00366612
X Variable 1	-2.530052875	1.051671633	-2.405744147	0.016509802	-4.59640578	-0.46369997	-4.59640578	-0.463699971

## 8Inception

Regression Statistics	
Multiple R	0.187699961
R Square	0.035231275
Adjusted R Square	0.03326637
Standard Error	5.564845369
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	555.2554667	555.2554667	17.93026222	2.73628E-05
Residual	491	15205.04445	30.96750398		
Total	492	15760.29992			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	10.49082948	0.983194826	10.6701431	4.79477E-24	8.559041187	12.42261778	8.559041187	12.42261778
X Variable 1	-5.516521487	1.302782732	-4.234414035	2.73628E-05	-8.07623841	-2.95680456	-8.07623841	-2.956804564

## 8-10Yr

Regression Statistics	
Multiple R	0.144759855
R Square	0.020955416
Adjusted R Square	0.018961435
Standard Error	4.011180594
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	169.0907047	169.0907047	10.50933662	0.001268451
Residual	491	7899.97875	16.08956976		
Total	492	8069.069455			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	10.30581319	0.708693907	14.5419808	4.24965E-40	8.913366279	11.69826009	8.913366279	11.69826009
X Variable 1	-3.0442391	0.93905517	-3.241810701	0.001268451	-4.889301481	-1.19917672	-4.889301481	-1.199176718

## 8-5Yr

Regression Statistics	
Multiple R	0.073402565
R Square	0.005387936
Adjusted R Square	0.00336225
Standard Error	7.702538964
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	157.8040139	157.8040139	2.659807694	0.103554411
Residual	491	29130.59129	59.32910649		
Total	492	29288.3953			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.04218684	1.360881741	1.50063505	0.134092728	-0.631683435	4.716057116	-0.631683435	4.716057116
X Variable 1	2.940884142	1.803236944	1.630891687	0.103554411	-0.602128832	6.483897115	-0.602128832	6.483897115

8-1Yr

Regression Statistics	
Multiple R	0.073129698
R Square	0.005347953
Adjusted R Square	0.003322185
Standard Error	18.43130389
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	896.8297162	896.8297162	2.639963187	0.104847661
Residual	491	166799.0648	339.7129629		
Total	492	167695.8945			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.019650789	3.256435968	1.848539584	0.065125356	-0.378618124	12.4179197	-0.378618124	12.4179197
X Variable 1	7.010901857	4.314941898	1.624796352	0.104847661	-1.467127154	15.48893087	-1.467127154	15.48893087

**Not included in study:**

5-10Yr

Regression Statistics	
Multiple R	0.068977061
R Square	0.004757835
Adjusted R Square	0.004321325
Standard Error	2.062051043
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	46.34621481	46.34621481	10.89972266	0.000976623
Residual	2280	9694.684267	4.252054503		
Total	2281	9741.030482			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.217472358	0.102009658	60.94984	0	6.017430908	6.417513807	6.017430908	6.417513807
X Variable 1	0.542539097	0.164332445	3.301472801	0.000976623	0.220282351	0.864795842	0.220282351	0.864795842

5-5Yr

Regression Statistics	
Multiple R	0.007231474
R Square	5.22942E-05
Adjusted R Square	-0.000386279
Standard Error	3.328560043
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.321064534	1.321064534	0.119237055	0.729895295
Residual	2280	25260.83128	11.07931196		
Total	2281	25262.15234			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.897579237	0.164663855	29.74289197	1.4972E-164	4.574672595	5.220485878	4.574672595	5.220485878
X Variable 1	0.091597985	0.265265213	0.34530719	0.729895295	-0.428588423	0.611784394	-0.428588423	0.611784394



5-1Yr

Regression Statistics	
Multiple R	0.115389213
R Square	0.013314671
Adjusted R Square	0.012881914
Standard Error	8.946480194
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	2462.583757	2462.583757	30.76710268	3.2459E-08
Residual	2280	182490.0779	80.03950786		
Total	2281	184952.6617			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	12.47110126	0.442582346	28.17803595	3.7964E-150	11.60319507	13.33900746	11.60319507	13.33900746
X Variable 1	3.95475342	0.712977968	5.546810136	3.2459E-08	2.556600061	5.352906778	2.556600061	5.352906778

5Inception

Regression Statistics	
Multiple R	0.112604511
R Square	0.012679776
Adjusted R Square	0.012246741
Standard Error	3.338013762
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	326.2606051	326.2606051	29.28116768	6.9151E-08
Residual	2280	25404.5258	11.14233588		
Total	2281	25730.7864			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.994761741	0.16513153	42.35872908	9.788E-290	6.670937986	7.318585497	6.670937986	7.318585497
X Variable 1	-1.43948195	0.266018615	-5.411207599	6.9151E-08	-1.961145784	-0.91781812	-1.961145784	-0.917818117

**Beta 5 Years versus Maximum Management Fee**

Beta 5 Years is the dependent variable.

Maximum Management Fee is the independent variable. All regressions are indexed in column A in the following format: [Fund Category]

1

Regression Statistics	
Multiple R	0.080067779
R Square	0.006410849
Adjusted R Square	0.004813439
Standard Error	0.252616849
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.25610835	0.25610835	4.013276774	0.045576669
Residual	622	39.69309934	0.063815272		
Total	623	39.94920769			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.69422474	0.016587489	41.85231069	4.8615E-183	0.661650474	0.726799005	0.661650474	0.726799005
X Variable 1	-0.066903722	0.033396482	-2.003316444	0.045576669	-0.132487241	-0.0013202	-0.132487241	-0.001320203

2

Regression Statistics	
Multiple R	0.014378055
R Square	0.000206728
Adjusted R Square	-0.000454948
Standard Error	0.555567323
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.096433502	0.096433502	0.312431311	0.576274882
Residual	1511	466.3777805	0.30865505		
Total	1512	466.474214			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.773276889	0.042032944	18.39692435	2.31167E-68	0.690827789	0.855725989	0.690827789	0.855725989
X Variable 1	0.048722008	0.087166157	0.558955554	0.576274882	-0.12225748	0.219701495	-0.12225748	0.219701495

3

Regression Statistics	
Multiple R	0.259332925
R Square	0.067253566
Adjusted R Square	0.066297883
Standard Error	0.34232553
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	8.246698457	8.246698457	70.37226607	1.7058E-16
Residual	976	114.3742861	0.117186769		
Total	977	122.6209846			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.615818256	0.049880819	12.34579279	1.21635E-32	0.517932258	0.713704253	0.517932258	0.713704253
X Variable 1	0.936987506	0.11169482	8.388817919	1.7058E-16	0.717797864	1.156177147	0.717797864	1.156177147

4

Regression Statistics	
Multiple R	0.116459567
R Square	0.013562831
Adjusted R Square	0.012912576
Standard Error	0.309259615
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1.99486227	1.99486227	20.8577038	5.34698E-06
Residual	1517	145.0881695	0.095641509		
Total	1518	147.0830317			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.121665395	0.022148218	50.64359665	0	1.078221024	1.165109766	1.078221024	1.165109766
X Variable 1	-0.142318304	0.031162157	-4.567023517	5.34698E-06	-0.203443779	-0.08119283	-0.203443779	-0.081192829

6

Regression Statistics	
Multiple R	0.061119076
R Square	0.003735541
Adjusted R Square	0.002383758
Standard Error	0.232050829
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.148803332	0.148803332	2.7634169	0.096867263
Residual	737	39.68567163	0.053847587		
Total	738	39.83447497			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.223009572	0.030111682	40.61578456	3.1272E-190	1.163894679	1.282124464	1.163894679	1.282124464
X Variable 1	-0.062542443	0.037622845	-1.662352821	0.096867263	-0.136403161	0.011318276	-0.136403161	0.011318276

7

Regression Statistics	
Multiple R	0.208927077
R Square	0.043650524
Adjusted R Square	0.041694799
Standard Error	0.119013967
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.316138623	0.316138623	22.31935765	3.02165E-06
Residual	489	6.926354656	0.014164324		
Total	490	7.242493279			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.932797368	0.012688734	73.51382271	1.8175E-266	0.907866199	0.957728537	0.907866199	0.957728537
X Variable 1	0.108378347	0.022940437	4.724336741	3.02165E-06	0.063304356	0.153452338	0.063304356	0.153452338

8

Regression Statistics	
Multiple R	0.020422445
R Square	0.000417076
Adjusted R Square	-0.001618734
Standard Error	0.310271336
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.019722476	0.019722476	0.204869887	0.65101832
Residual	491	47.26773635	0.096268302		
Total	492	47.28745882			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.15752203	0.054818625	21.11548814	6.76678E-71	1.049813999	1.265230061	1.049813999	1.265230061
X Variable 1	-0.032877563	0.072637443	-0.452625548	0.65101832	-0.175596136	0.109841011	-0.175596136	0.109841011

**Not included in study:**

5

Regression Statistics	
Multiple R	0.297620406
R Square	0.088577906
Adjusted R Square	0.088178159
Standard Error	0.220956068
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	10.81813928	10.81813928	221.5851763	6.72381E-48
Residual	2280	111.3132113	0.048821584		
Total	2281	122.1313506			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.78500184	0.010930696	71.81627257	0	0.763566691	0.80643699	0.763566691	0.80643699
X Variable 1	0.262120018	0.017608803	14.88573735	6.72381E-48	0.227589067	0.296650969	0.227589067	0.296650969

**Alpha 5 Years versus Maximum Management Fee**

Alpha 5 Years is the dependent variable.

Maximum Management Fee is the independent variable. All regressions are indexed in column A in the following format: [Fund Category]

1

Regression Statistics	
Multiple R	0.061378931
R Square	0.003767373
Adjusted R Square	0.002165713
Standard Error	2.033636575
Observations	624

## ANOVA

	df	SS	MS	F	Significance F
Regression	1	9.727807029	9.727807029	2.352167575	0.1256174
Residual	622	2572.391541	4.135677719		
Total	623	2582.119348			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.192047008	0.133533944	-1.438188692	0.150883458	-0.454278996	0.070184979	-0.454278996	0.070184979
X Variable 1	0.412330904	0.268851062	1.533677794	0.1256174	-0.115634842	0.940296649	-0.115634842	0.940296649

2

Regression Statistics	
Multiple R	0.179757442
R Square	0.032312738
Adjusted R Square	0.03167231
Standard Error	2.848802787
Observations	1513

## ANOVA

	df	SS	MS	F	Significance F
Regression	1	409.4755474	409.4755474	50.45488272	1.87134E-12
Residual	1511	12262.78843	8.115677321		
Total	1512	12672.26398			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.307599806	0.215533857	-1.427153074	0.153742388	-0.730377058	0.115177445	-0.730377058	0.115177445
X Variable 1	3.174864477	0.446965077	7.103160052	1.87134E-12	2.298126736	4.051602218	2.298126736	4.051602218

3

Regression Statistics	
Multiple R	0.187451419
R Square	0.035138034
Adjusted R Square	0.034149446
Standard Error	1.341843223
Observations	978

## ANOVA

	df	SS	MS	F	Significance F
Regression	1	63.99788883	63.99788883	35.5436557	3.48167E-09
Residual	976	1757.330198	1.800543235		
Total	977	1821.328086			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.057331857	0.195522195	-0.293224291	0.769413052	-0.441024134	0.32636042	-0.441024134	0.32636042
X Variable 1	-2.610216714	0.437819922	-5.961850023	3.48167E-09	-3.469393459	-1.75103997	-3.469393459	-1.751039968

4

Regression Statistics	
Multiple R	0.022348127
R Square	0.000499439
Adjusted R Square	-0.000159428
Standard Error	2.67637295
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	5.429728041	5.429728041	0.758027243	0.384084349
Residual	1517	10866.22878	7.162972167		
Total	1518	10871.6585			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.628641165	0.191673557	-3.279749048	0.001062552	-1.004614406	-0.25266792	-1.004614406	-0.252667924
X Variable 1	-0.234797431	0.269681362	-0.8706476	0.384084349	-0.763785245	0.294190383	-0.763785245	0.294190383

6

Regression Statistics	
Multiple R	0.051306779
R Square	0.002632386
Adjusted R Square	0.001279105
Standard Error	2.332255655
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	10.58069103	10.58069103	1.945188634	0.163526481
Residual	737	4008.849916	5.439416439		
Total	738	4019.430607			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.018188396	0.302641193	-0.060098877	0.952093177	-0.612329957	0.575953166	-0.612329957	0.575953166
X Variable 1	0.527382272	0.378133074	1.394700195	0.163526481	-0.214964044	1.269728587	-0.214964044	1.269728587

7

Regression Statistics	
Multiple R	0.325266951
R Square	0.105798589
Adjusted R Square	0.103969956
Standard Error	2.465223606
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	351.6138878	351.6138878	57.85666348	1.45743E-13
Residual	489	2971.813111	6.077327426		
Total	490	3323.426999			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.89121024	0.262831062	3.390810177	0.000753296	0.374792652	1.407627828	0.374792652	1.407627828
X Variable 1	-3.614404503	0.475182089	-7.606356781	1.45743E-13	-4.548055139	-2.68075387	-4.548055139	-2.680753867

8

Regression Statistics	
Multiple R	0.029512987
R Square	0.000871016
Adjusted R Square	-0.00116387
Standard Error	5.614346898
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	13.49226151	13.49226151	0.428041881	0.513257654
Residual	491	15476.75753	31.52089109		
Total	492	15490.24979			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-1.537374667	0.991940738	-1.549865439	0.121818107	-3.486346994	0.41159766	-3.486346994	0.41159766
X Variable 1	0.859926372	1.314371507	0.654249097	0.513257654	-1.722560259	3.442413002	-1.722560259	3.442413002

**Not included in study:**

5

Regression Statistics	
Multiple R	0.061648832
R Square	0.003800579
Adjusted R Square	0.003363649
Standard Error	2.637689335
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	60.51813797	60.51813797	8.698377874	0.003217343
Residual	2280	15862.88347	6.957405029		
Total	2281	15923.40161			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.236449701	0.130486483	-1.812062794	0.070107995	-0.492334346	0.019434944	-0.492334346	0.019434944
X Variable 1	-0.619964302	0.210207181	-2.949301252	0.003217343	-1.032181635	-0.20774697	-1.032181635	-0.20774697

**Load Adjusted Return versus Multi-variable Costs**

Load Adjusted Return is the dependent variable. The variable is segmented as follows: '10 Years', '5 Years'.

Maximum Load Charge, Redemption Fee, 12B-1 Fee, Maximum Management Fee comprise the independent variables.

All regressions are indexed in column A in the following format: [Fund Category]-[Return Timespan]

**1 - 5Yr**

Regression Statistics	
Multiple R	0.263076531
R Square	0.069209261
Adjusted R Square	0.063194458
Standard Error	2.441892703
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	274.4454037	68.61135092	11.50648872	5.13276E-09
Residual	619	3690.997944	5.962839975		
Total	623	3965.443348			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.000160936	0.201440373	24.82203974	6.29543E-95	4.604571569	5.395750303	4.604571569	5.395750303
% Max Load	-0.181483014	0.046657123	-3.88971723	0.000111226	-0.273108449	-0.08985758	-0.273108449	-0.08985758
% Redemption Fee	-0.702168481	0.194718851	-3.606063196	0.000335929	-1.084558097	-0.319778865	-1.084558097	-0.319778865
% 12B-1 Fee	-0.907545475	0.254089574	-3.571754097	0.000382139	-1.406527542	-0.408563409	-1.406527542	-0.408563409
% Maximum Management Fee	0.135392316	0.330212584	0.410015616	0.681936355	-0.513080407	0.783865039	-0.513080407	0.783865039

**1-10Yr**

Regression Statistics	
Multiple R	0.269380915
R Square	0.072566077
Adjusted R Square	0.066572966
Standard Error	2.033214455
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	200.22011	50.05502749	12.10824854	1.75547E-09
Residual	619	2558.921871	4.133961019		
Total	623	2759.141981			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.101368616	0.167727057	36.37677016	7.6807E-156	5.771985586	6.430751646	5.771985586	6.430751646
% Max Load	-0.102861815	0.038848528	-2.647766115	0.008308978	-0.179152701	-0.02657093	-0.179152701	-0.02657093
% Redemption Fee	-0.74267572	0.162130458	-4.580729186	5.60473E-06	-1.061068127	-0.424283313	-1.061068127	-0.424283313
% 12B-1 Fee	-0.682296161	0.211564821	-3.224998165	0.001326065	-1.097767958	-0.266824363	-1.097767958	-0.266824363
% Maximum Management Fee	0.12445107	0.274947789	0.452635284	0.650969982	-0.415492438	0.664394579	-0.415492438	0.664394579

**2-5Yr**

Regression Statistics	
Multiple R	0.181777772
R Square	0.033043159
Adjusted R Square	0.030478286
Standard Error	2.734666356
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	385.3758546	96.34396364	12.88296462	2.5733E-10
Residual	1508	11277.42732	7.478400077		
Total	1512	11662.80317			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.463924459	0.212273284	16.3182309	2.97809E-55	3.047542272	3.880306646	3.047542272	3.880306646
% Max Load	0.020124928	0.042531059	0.473181907	0.636151889	-0.063301376	0.103551231	-0.063301376	0.103551231
% Redemption Fee	0.398083723	0.14892214	2.673099673	0.007596454	0.105967235	0.690200211	0.105967235	0.690200211
% 12B-1 Fee	-0.589314077	0.190988323	-3.085602662	0.002068349	-0.963944996	-0.214683157	-0.963944996	-0.214683157
% Maximum Management Fee	2.592021208	0.444295674	5.834000548	6.61101E-09	1.720518204	3.463524213	1.720518204	3.463524213



2-10Yr

Regression Statistics	
Multiple R	0.333264999
R Square	0.111065559
Adjusted R Square	0.108707643
Standard Error	2.048733655
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	790.8279683	197.7069921	47.10326647	2.37621E-37
Residual	1508	6329.542861	4.19730959		
Total	1512	7120.370829			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.410456635	0.15902906	15.15733434	2.06701E-48	2.098515035	2.722398236	2.098515035	2.722398236
% Max Load	0.056922585	0.03186305	1.786476314	0.074223005	-0.00557801	0.11942318	-0.00557801	0.11942318
% Redemption Fee	0.216788902	0.111568199	1.943106588	0.052189162	-0.002056399	0.435634203	-0.002056399	0.435634203
% 12B-1 Fee	-0.443261889	0.143082977	-3.097935881	0.001984706	-0.723924637	-0.162599142	-0.723924637	-0.162599142
% Maximum Management Fee	4.177268017	0.332853585	12.54986637	1.9598E-34	3.524362944	4.830173089	3.524362944	4.830173089

3-5Yr

Regression Statistics	
Multiple R	0.269619809
R Square	0.072694842
Adjusted R Square	0.068882693
Standard Error	0.961877056
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	70.57207548	17.64301887	19.06925682	4.1165E-15
Residual	973	900.226869	0.925207471		
Total	977	970.7989445			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.797192209	0.141223953	19.80678311	1.27223E-73	2.520053608	3.07433081	2.520053608	3.07433081
% Max Load	-0.016250599	0.018134473	-0.896116435	0.370412224	-0.05183778	0.019336582	-0.05183778	0.019336582
% Redemption Fee	-0.186383824	0.080102747	-2.326809385	0.020179921	-0.34357786	-0.029189787	-0.34357786	-0.029189787
% 12B-1 Fee	-0.418710419	0.090982047	-4.602121307	4.7351E-06	-0.59725405	-0.240166788	-0.59725405	-0.240166788
% Maximum Management Fee	2.132091316	0.323228669	6.596232089	6.91201E-11	1.497785738	2.766396894	1.497785738	2.766396894

3-10Yr

Regression Statistics	
Multiple R	0.319618305
R Square	0.102155861
Adjusted R Square	0.098464826
Standard Error	0.737227851
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	60.16981045	15.04245261	27.67675601	8.65488E-22
Residual	973	528.8302714	0.543504904		
Total	977	589.0000818			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.437340058	0.108240685	22.51778116	1.03968E-90	2.224927989	2.649752126	2.224927989	2.649752126
% Max Load	0.020153278	0.013899113	1.449968586	0.14738953	-0.007122413	0.047428968	-0.007122413	0.047428968
% Redemption Fee	-0.221209839	0.061394516	-3.60308794	0.000330381	-0.341690748	-0.10072893	-0.341690748	-0.10072893
% 12B-1 Fee	-0.318428794	0.069732924	-4.566405328	5.59734E-06	-0.455273037	-0.181584551	-0.455273037	-0.181584551
% Maximum Management Fee	1.608675462	0.247737666	6.493463386	1.33549E-10	1.122513811	2.094837114	1.122513811	2.094837114

4-5Yr

Regression Statistics	
Multiple R	0.205715547
R Square	0.042318886
Adjusted R Square	0.039788685
Standard Error	4.110567913
Observations	1519

## ANOVA

	df	SS	MS	F	Significance F
Regression	4	1130.427818	282.6069546	16.72550307	2.0101E-13
Residual	1514	25581.70761	16.89676857		
Total	1518	26712.13543			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.089036032	0.311499777	22.75775633	7.5599E-99	6.478019217	7.700052847	6.478019217	7.700052847
% Max Load	-0.148153926	0.050072763	-2.958772713	0.003136623	-0.246373259	-0.049934593	-0.246373259	-0.049934593
% Redemption Fee	0.381860143	0.200833199	1.901379577	0.057442006	-0.012080625	0.77580091	-0.012080625	0.77580091
% 12B-1 Fee	-1.80668414	0.277462095	-6.51146292	1.00972E-10	-2.350934947	-1.262433333	-2.350934947	-1.262433333
% Maximum Management Fee	-1.811646803	0.422765497	-4.285228613	1.94063E-05	-2.640914898	-0.982378708	-2.640914898	-0.982378708

4-10Yr

Regression Statistics	
Multiple R	0.183364463
R Square	0.033622526
Adjusted R Square	0.031069349
Standard Error	3.239164352
Observations	1519

## ANOVA

	df	SS	MS	F	Significance F
Regression	4	552.6820861	138.1705215	13.16889784	1.50865E-10
Residual	1514	15885.16914	10.4921857		
Total	1518	16437.85123			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	8.186428501	0.245464616	33.35074778	2.5886E-183	7.704941776	8.667915226	7.704941776	8.667915226
% Max Load	-0.06674719	0.039457786	-1.691610106	0.090926129	-0.144144904	0.010650525	-0.144144904	0.010650525
% Redemption Fee	0.073942331	0.15825836	0.46722543	0.640405835	-0.236486524	0.384371186	-0.236486524	0.384371186
% 12B-1 Fee	-1.32464895	0.218642617	-6.058512143	1.7305E-09	-1.753523462	-0.895774437	-1.753523462	-0.895774437
% Maximum Management Fee	-1.103245016	0.333143	-3.311625986	0.000949402	-1.756715706	-0.449774325	-1.756715706	-0.449774325

6-5Yr

Regression Statistics	
Multiple R	0.191238671
R Square	0.036572229
Adjusted R Square	0.031321942
Standard Error	3.371861412
Observations	739

## ANOVA

	df	SS	MS	F	Significance F
Regression	4	316.787301	79.19682526	6.965757319	1.6621E-05
Residual	734	8345.175847	11.36944938		
Total	738	8661.963148			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	8.628610394	0.462170957	18.6697374	6.03268E-64	7.721275814	9.535944974	7.721275814	9.535944974
% Max Load	-0.186810312	0.059130832	-3.159270837	0.001646516	-0.302896031	-0.070724592	-0.302896031	-0.070724592
% Redemption Fee	0.145192074	0.196252427	0.739823073	0.459643909	-0.240090928	0.530475076	-0.240090928	0.530475076
% 12B-1 Fee	-1.445541403	0.322225288	-4.486120291	8.41658E-06	-2.078134477	-0.812948329	-2.078134477	-0.812948329
% Maximum Management Fee	-0.440901562	0.55130093	-0.799747539	0.424115823	-1.523216213	0.64141309	-1.523216213	0.64141309

6-10Yr

Regression Statistics	
Multiple R	0.140926237
R Square	0.019860204
Adjusted R Square	0.014518843
Standard Error	2.428666476
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	87.72583406	21.93145852	3.718191541	0.005262481
Residual	734	4329.440905	5.898420851		
Total	738	4417.166739			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	9.484151003	0.332890048	28.49034103	8.1251E-121	8.830620858	10.13768115	8.830620858	10.13768115
% Max Load	-0.038331867	0.042590442	-0.900011009	0.368409571	-0.121945474	0.045281741	-0.121945474	0.045281741
% Redemption Fee	0.03192078	0.141355659	0.225818904	0.821405137	-0.24558882	0.30943038	-0.24558882	0.30943038
% 12B-1 Fee	-0.875724981	0.232090724	-3.773201135	0.000174162	-1.33136577	-0.420084193	-1.33136577	-0.420084193
% Maximum Management Fee	-0.174062902	0.397088113	-0.438348306	0.661262794	-0.953626765	0.605500962	-0.953626765	0.605500962

7-5Yr

Regression Statistics	
Multiple R	0.362938453
R Square	0.131724321
Adjusted R Square	0.124578019
Standard Error	3.030049685
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	676.930527	169.2326317	18.43251553	4.09674E-14
Residual	486	4462.063731	9.181201093		
Total	490	5138.994258			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	8.110225171	0.352229136	23.02542393	7.22158E-80	7.418145227	8.802305115	7.418145227	8.802305115
% Max Load	-0.169278983	0.064857649	-2.610008004	0.009333389	-0.296715	-0.041842966	-0.296715	-0.041842966
% Redemption Fee	0.238569579	0.30781322	0.775046566	0.438689071	-0.366239433	0.843378591	-0.366239433	0.843378591
% 12B-1 Fee	-1.390661297	0.359458502	-3.868767296	0.000124294	-2.096945914	-0.684376681	-2.096945914	-0.684376681
% Maximum Management Fee	-4.088555809	0.590707098	-6.921460439	1.41865E-11	-5.249210887	-2.927900731	-5.249210887	-2.927900731

7-10Yr

Regression Statistics	
Multiple R	0.323263184
R Square	0.104499086
Adjusted R Square	0.097128708
Standard Error	1.514046764
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	130.0053746	32.50134364	14.17825349	5.93662E-11
Residual	486	1114.076076	2.292337604		
Total	490	1244.08145			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.777439362	0.176000871	44.18977774	2.3877E-172	7.431622789	8.123255936	7.431622789	8.123255936
% Max Load	-0.101107804	0.032407889	-3.119851588	0.001916965	-0.164784677	-0.037430931	-0.164784677	-0.037430931
% Redemption Fee	-0.022805066	0.15380725	-0.148270423	0.882190854	-0.325014344	0.279404212	-0.325014344	0.279404212
% 12B-1 Fee	-0.994022395	0.17961322	-5.534238475	5.11937E-08	-1.34693672	-0.641108071	-1.34693672	-0.641108071
% Maximum Management Fee	-1.036351129	0.295162873	-3.511116146	0.000487813	-1.616304017	-0.456398241	-1.616304017	-0.456398241

8-5Yr

Regression Statistics	
Multiple R	0.122218183
R Square	0.014937284
Adjusted R Square	0.006863
Standard Error	7.68899925
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	437.4890831	109.3722708	1.849982379	0.118071346
Residual	488	28850.90622	59.12070947		
Total	492	29288.3953			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.655773678	1.396329506	1.901967742	0.057763911	-0.087786297	5.399333654	-0.087786297	5.399333654
% Max Load	-0.200242632	0.16372739	-1.223024634	0.221910671	-0.521940278	0.121455014	-0.521940278	0.121455014
% Redemption Fee	0.090278628	0.560215425	0.161149843	0.872042076	-1.010453407	1.191010663	-1.010453407	1.191010663
% 12B-1 Fee	-1.666060549	0.858995731	-1.939544619	0.053010977	-3.353847205	0.021726107	-3.353847205	0.021726107
% Maximum Management Fee	3.239174072	1.807590549	1.791984403	0.073754857	-0.312446847	6.790794991	-0.312446847	6.790794991

8-10Yr

Regression Statistics	
Multiple R	0.193691358
R Square	0.037516342
Adjusted R Square	0.029627132
Standard Error	3.989316543
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	302.7219722	75.68049304	4.755398942	0.000900777
Residual	488	7766.347483	15.91464648		
Total	492	8069.069455			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	10.68496583	0.724463642	14.74879513	5.5996E-41	9.261512814	12.10841885	9.261512814	12.10841885
% Max Load	-0.006942347	0.084947386	-0.081725255	0.934898703	-0.17385012	0.159965426	-0.17385012	0.159965426
% Redemption Fee	-0.158339622	0.290658978	-0.544760814	0.586166885	-0.729437156	0.412757913	-0.729437156	0.412757913
% 12B-1 Fee	-1.162762767	0.445676449	-2.608984096	0.009359813	-2.038444376	-0.287081159	-2.038444376	-0.287081159
% Maximum Management Fee	-2.818860819	0.937839977	-3.005694882	0.002786199	-4.661563573	-0.976158066	-4.661563573	-0.976158066

*Not included in study:*

5-5Yr

Regression Statistics	
Multiple R	0.218567711
R Square	0.047771844
Adjusted R Square	0.046099068
Standard Error	2.018326606
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	465.346992	116.336748	28.55841033	3.46791E-23
Residual	2277	9275.68349	4.073642288		
Total	2281	9741.030482			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.757300837	0.113302054	59.63970312	0	6.535114788	6.979486885	6.535114788	6.979486885
% Max Load	-0.085980853	0.0197999	-4.342489204	1.47049E-05	-0.124808584	-0.047153123	-0.124808584	-0.047153123
% Redemption Fee	0.096224865	0.083001631	1.159312946	0.246450203	-0.066541862	0.258991592	-0.066541862	0.258991592
% 12B-1 Fee	-1.046340756	0.109657194	-9.541925309	3.46962E-21	-1.261379212	-0.8313023	-1.261379212	-0.8313023
% Maximum Management Fee	0.456985878	0.163363062	2.797363576	0.005195466	0.136629874	0.777341883	0.136629874	0.777341883

5-10Yr

Regression Statistics	
Multiple R	0.218567711
R Square	0.047771844
Adjusted R Square	0.046099068
Standard Error	2.018326606
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	4	465.346992	116.336748	28.55841033	3.46791E-23
Residual	2277	9275.68349	4.073642288		
Total	2281	9741.030482			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	6.757300837	0.113302054	59.63970312	0	6.535114788	6.979486885	6.535114788	6.979486885
% Max Load	-0.085980853	0.0197999	-4.342489204	1.47049E-05	-0.124808584	-0.047153123	-0.124808584	-0.047153123
% Redemption Fee	0.096224865	0.083001631	1.159312946	0.246450203	-0.066541862	0.258991592	-0.066541862	0.258991592
% 12B-1 Fee	-1.046340756	0.109657194	-9.541925309	3.46962E-21	-1.261379212	-0.8313023	-1.261379212	-0.8313023
% Maximum Management Fee	0.456985878	0.163363062	2.797363576	0.005195466	0.136629874	0.777341883	0.136629874	0.777341883

**1 Year Load Adjusted Return versus Turnover Ratio**

1 Year Adjusted Return is the dependent variable.

The turnover ratio is the independent variable. All regressions are indexed in column A in the following format: [Fund Category]

**1 SUMMARY OUTPUT**

Regression Statistics	
Multiple R	0.114369823
R Square	0.013080456
Adjusted R Square	0.011493769
Standard Error	5.505063466
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	249.8366756	249.8366756	8.243877543	0.004228126
Residual	622	18850.16018	30.30572377		
Total	623	19099.99686			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	9.243154839	0.242554297	38.10756995	8.149E-165	8.766830292	9.719479385	8.766830292	9.719479385
X Variable 1	-0.003957493	0.001378334	-2.871215343	0.004228126	-0.006664244	-0.00125074	-0.006664244	-0.001250742

**2 SUMMARY OUTPUT**

Regression Statistics	
Multiple R	0.277397545
R Square	0.076949398
Adjusted R Square	0.076338511
Standard Error	6.938033039
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	6063.409597	6063.409597	125.9633434	3.92309E-28
Residual	1511	72733.95299	48.13630244		
Total	1512	78797.36259			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.583924607	0.208110084	7.610994017	4.76204E-14	1.175709346	1.992139868	1.175709346	1.992139868
X Variable 1	-0.007094045	0.00063208	-11.22333923	3.92309E-28	-0.008333891	-0.0058542	-0.008333891	-0.005854198

**3 SUMMARY OUTPUT**

Regression Statistics	
Multiple R	0.038220534
R Square	0.001460809
Adjusted R Square	0.000437716
Standard Error	1.56220285
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	3.484601041	3.484601041	1.427835615	0.232408273
Residual	976	2381.906278	2.440477744		
Total	977	2385.390879			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-4.381777146	0.072235875	-60.65929316	0	-4.523532652	-4.24002164	-4.523532652	-4.240021641
X Variable 1	0.003053454	0.002555361	1.194920757	0.232408273	-0.00196118	0.008068087	-0.00196118	0.008068087

## 4 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.026801037
R Square	0.000718296
Adjusted R Square	5.95733E-05
Standard Error	8.017775167
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	70.09847959	70.09847959	1.090437682	0.296540622
Residual	1517	97519.91815	64.28471862		
Total	1518	97590.01663			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	17.22562054	0.265257734	64.9391831	0	16.7053098	17.74593128	16.7053098	17.74593128
X Variable 1	-0.002452451	0.002348551	-1.044240242	0.296540622	-0.007059202	0.002154299	-0.007059202	0.002154299

## 6 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.051290262
R Square	0.002630691
Adjusted R Square	0.001277408
Standard Error	6.909999322
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	92.81909641	92.81909641	1.943933154	0.163662278
Residual	737	35190.3428	47.74809064		
Total	738	35283.16189			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	20.57129735	0.325998732	63.10238453	2.2693E-299	19.93130055	21.21129415	19.93130055	21.21129415
X Variable 1	0.003969933	0.002847361	1.394250033	0.163662278	-0.001619972	0.009559838	-0.001619972	0.009559838

## 7 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.002388044
R Square	5.70275E-06
Adjusted R Square	-0.002039275
Standard Error	5.488202826
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.083995553	0.083995553	0.002788663	0.95790662
Residual	489	14728.86106	30.12037026		
Total	490	14728.94505			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	18.60411469	0.326608593	56.96149787	5.4681E-218	17.96238528	19.2458441	17.96238528	19.2458441
X Variable 1	-0.000215553	0.00408184	-0.05280779	0.95790662	-0.008235662	0.007804556	-0.008235662	0.007804556

## 8 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.141375301
R Square	0.019986976
Adjusted R Square	0.017991022
Standard Error	18.29516762
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	3351.733763	3351.733763	10.01374962	0.001650157
Residual	491	164344.1608	334.7131584		
Total	492	167695.8945			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	9.690253244	0.942143627	10.28532484	1.33219E-22	7.839122641	11.54138385	7.839122641	11.54138385
X Variable 1	0.012628855	0.003990852	3.164450919	0.001650157	0.0047876	0.02047011	0.0047876	0.02047011

*Not included in study:*

## 5 SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.089605403
R Square	0.008029128
Adjusted R Square	0.007594053
Standard Error	8.970410742
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1485.008646	1485.008646	18.45458672	1.81302E-05
Residual	2280	183467.653	80.46826888		
Total	2281	184952.6617			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	14.13323421	0.228881747	61.74906648	0	13.68439596	14.58207246	13.68439596	14.58207246
X Variable 1	0.007562252	0.00176035	4.295880203	1.81302E-05	0.004110197	0.011014307	0.004110197	0.011014307



5 Year Load Adjusted Return versus 5 Year Sharpe Ratio

5 Year Load Adjusted Return is the dependent variable.

The Sharpe ratio is the independent variable. All regressions are indexed in column A in the following format: [Fund Category]

1

Regression Statistics	
Multiple R	0.805148705
R Square	0.648264438
Adjusted R Square	0.647698947
Standard Error	1.497472386
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	2570.655903	2570.655903	1146.373934	2.964E-143
Residual	622	1394.787445	2.242423546		
Total	623	3965.443348			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.03042964	0.141042704	-0.215747704	0.829255143	-0.307407219	0.24654794	-0.307407219	0.24654794
X Variable 1	9.325248384	0.275421131	33.85814429	2.964E-143	8.784380435	9.866116333	8.784380435	9.866116333

2

Regression Statistics	
Multiple R	0.211933428
R Square	0.044915778
Adjusted R Square	0.04428369
Standard Error	2.715126548
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	523.8438779	523.8438779	71.05943013	7.97289E-17
Residual	1511	11138.95929	7.371912172		
Total	1512	11662.80317			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.359141508	0.156149937	21.51228217	9.176E-90	3.052847906	3.66543511	3.052847906	3.66543511
X Variable 1	1.320687739	0.156671242	8.429675565	7.97289E-17	1.01337158	1.628003899	1.01337158	1.628003899

3

Regression Statistics	
Multiple R	0.134913195
R Square	0.01820157
Adjusted R Square	0.017195629
Standard Error	0.98821378
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	17.67006513	17.67006513	18.09407304	2.30481E-05
Residual	976	953.1288794	0.976566475		
Total	977	970.7989445			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.147335908	0.086445266	36.40842416	5.1285E-184	2.97769593	3.316975887	2.97769593	3.316975887
X Variable 1	0.540009166	0.126950075	4.253712854	2.30481E-05	0.290882649	0.789135683	0.290882649	0.789135683

4

Regression Statistics	
Multiple R	0.931755967
R Square	0.868169183
Adjusted R Square	0.86808228
Standard Error	1.523596568
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	23190.65279	23190.65279	9990.17284	0
Residual	1517	3521.482645	2.321346503		
Total	1518	26712.13543			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-3.776884475	0.097826203	-38.60810669	1.0297E-227	-3.968773409	-3.58499554	-3.968773409	-3.584995541
X Variable 1	21.77713934	0.217878476	99.95085212	0	21.34976439	22.20451429	21.34976439	22.20451429

6

Regression Statistics	
Multiple R	0.89056807
R Square	0.793111488
Adjusted R Square	0.792830771
Standard Error	1.559346429
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	6869.902481	6869.902481	2825.305093	2.3286E-254
Residual	737	1792.060667	2.431561285		
Total	738	8661.963148			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-3.813955481	0.223004383	-17.10260321	1.77399E-55	-4.251755012	-3.37615595	-4.251755012	-3.37615595
X Variable 1	24.34145129	0.457945496	53.15359906	2.3286E-254	23.44241818	25.2404844	23.44241818	25.2404844

7

Regression Statistics	
Multiple R	0.932209652
R Square	0.869014835
Adjusted R Square	0.868746971
Standard Error	1.173263859
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	4465.862246	4465.862246	3244.247189	5.6005E-218
Residual	489	673.1320121	1.376548082		
Total	490	5138.994258			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-4.557715693	0.181971727	-25.04628482	1.08031E-89	-4.91525867	-4.20017272	-4.91525867	-4.200172717
X Variable 1	23.45449398	0.41178365	56.95829342	5.6005E-218	22.64541031	24.26357765	22.64541031	24.26357765

8

Regression Statistics	
Multiple R	0.85875098
R Square	0.737453245
Adjusted R Square	0.736918527
Standard Error	3.957403832
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	21598.82216	21598.82216	1379.143093	1.0895E-144
Residual	491	7689.573139	15.66104509		
Total	492	29288.3953			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-6.512917139	0.338823382	-19.22215964	8.29499E-62	-7.178639768	-5.84719451	-7.178639768	-5.847194511
X Variable 1	27.11470499	0.730130044	37.13681587	1.0895E-144	25.68014021	28.54926977	25.68014021	28.54926977

**Not included in study:**

5

Regression Statistics	
Multiple R	0.794249176
R Square	0.630831753
Adjusted R Square	0.630669837
Standard Error	2.022459908
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	15936.16784	15936.16784	3896.045794	0
Residual	2280	9325.984499	4.090344078		
Total	2281	25262.15234			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-3.018023493	0.134479	-22.44234046	5.9816E-101	-3.281737483	-2.7543095	-3.281737483	-2.754309503
X Variable 1	18.35719872	0.294099565	62.41831297	0	17.780468	18.93392944	17.780468	18.93392944

**Fund Size versus Maximum Management Fee**

*Net Assets is the dependent variable.*

*The Management Fee is the independent variable. All regressions are indexed in column A in the following format: [Fund Category]*

**All Categories**

Regression Statistics	
Multiple R	0.130378526
R Square	0.01699856
Adjusted R Square	0.016843878
Standard Error	4359.708837
Observations	6357

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	2088759823	2088759823	109.8938866	1.6677E-25
Residual	6355	1.2079E+11	19007061.15		
Total	6356	1.22879E+11			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2185.716544	132.7714793	16.46224441	1.16151E-59	1925.439655	2445.993434	1925.439655	2445.993434
X Variable 1	-2278.309283	217.3331192	-10.4830285	1.6677E-25	-2704.355514	-1852.263053	-2704.355514	-1852.263053

1

Regression Statistics	
Multiple R	0.085041489
R Square	0.007232055
Adjusted R Square	0.005635965
Standard Error	4152.785013
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	78141770.54	78141770.54	4.531107335	0.033676412
Residual	622	10726777735	17245623.37		
Total	623	10804919505			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1569.000511	272.6828227	5.75393967	1.36893E-08	1033.510011	2104.491011	1033.510011	2104.491011
X Variable 1	-1168.638087	549.006974	-2.128639785	0.033676412	-2246.769875	-90.50629963	-2246.769875	-90.50629963

2

Regression Statistics	
Multiple R	0.086279877
R Square	0.007444217
Adjusted R Square	0.006787331
Standard Error	5833.159285
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	385599310.6	385599310.6	11.33257436	0.000780704
Residual	1511	51412904081	34025747.24		
Total	1512	51798503391			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2561.954641	441.3233949	5.805163902	7.82304E-09	1696.283258	3427.626025	1696.283258	3427.626025
X Variable 1	-3080.912256	915.1979555	-3.366388919	0.000780704	-4876.105281	-1285.719231	-4876.105281	-1285.719231

3

Regression Statistics	
Multiple R	0.277150712
R Square	0.076812517
Adjusted R Square	0.075866628
Standard Error	1502.687024
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	183370292.9	183370292.9	81.20670822	1.04877E-18
Residual	976	2203874652	2258068.291		
Total	977	2387244945			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2418.883386	218.9590109	11.04719727	8.13614E-27	1989.198758	2848.568014	1989.198758	2848.568014
X Variable 1	-4418.330834	490.300435	-9.011476473	1.04877E-18	-5380.49521	-3456.166459	-5380.49521	-3456.166459

4

Regression Statistics	
Multiple R	0.121203935
R Square	0.014690394
Adjusted R Square	0.014040882
Standard Error	2964.616865
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	198784928.6	198784928.6	22.61758881	2.16445E-06
Residual	1517	13332841936	8788953.155		
Total	1518	13531626865			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1709.230824	212.3166948	8.050383536	1.65186E-15	1292.765469	2125.696179	1292.765469	2125.696179
X Variable 1	-1420.679222	298.7258988	-4.755795287	2.16445E-06	-2006.638736	-834.7197073	-2006.638736	-834.7197073

6

Regression Statistics	
Multiple R	0.150528698
R Square	0.022658889
Adjusted R Square	0.021332781
Standard Error	1558.871988
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	41522245.73	41522245.73	17.08676821	3.98132E-05
Residual	737	1790970342	2430081.875		
Total	738	1832492588			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1331.033138	202.2843754	6.580009629	8.92393E-11	933.910878	1728.155398	933.910878	1728.155398
X Variable 1	-1044.741694	252.7428994	-4.133614424	3.98132E-05	-1540.923524	-548.5598652	-1540.923524	-548.5598652

7

Regression Statistics	
Multiple R	0.281339646
R Square	0.079151997
Adjusted R Square	0.077268872
Standard Error	8713.130326
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	3191032320	3191032320	42.03226398	2.19807E-10
Residual	489	37124214995	75918640.07		
Total	490	40315247316			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7746.434595	928.9547983	8.338871396	7.67939E-16	5921.199051	9571.670139	5921.199051	9571.670139
X Variable 1	-10888.53236	1679.492058	-6.48322944	2.19807E-10	-14188.44383	-7588.620879	-14188.44383	-7588.620879

8

Regression Statistics	
Multiple R	0.338072873
R Square	0.114293268
Adjusted R Square	0.112489384
Standard Error	1149.486383
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	83718195.38	83718195.38	63.35956633	1.20302E-14
Residual	491	648767602.3	1321318.946		
Total	492	732485797.7			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1999.147952	203.09083	9.843615057	5.50065E-21	1600.113622	2398.182282	1600.113622	2398.182282
X Variable 1	-2142.046141	269.1055927	-7.959872256	1.20302E-14	-2670.786754	-1613.305529	-2670.786754	-1613.305529

*Not included in study:*

5

Regression Statistics	
Multiple R	0.136437351
R Square	0.018615151
Adjusted R Square	0.018184719
Standard Error	4170.441385
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	752187476.7	752187476.7	43.24760436	5.96126E-11
Residual	2280	39655085460	17392581.34		
Total	2281	40407272936			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2238.812881	206.3117217	10.85160291	8.73976E-27	1834.234564	2643.391199	1834.234564	2643.391199
X Variable 1	-2185.681892	332.357839	-6.576291079	5.96126E-11	-2837.437275	-1533.926509	-2837.437275	-1533.926509

**Load Adjusted Return versus Expense Ratio**

Load Adjusted Return is the dependent variable. The variable is segmented as follows: '1 Year', '5 Years'.

Expense Ratio is the independent variable. All regressions are indexed in column A in the following format: [Fund Category]-[Return Timespan]

1-5Yrs

Regression Statistics	
Multiple R	0.25724675
R Square	0.066175891
Adjusted R Square	0.064674566
Standard Error	2.439962905
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	262.4167451	262.4167451	44.07832645	6.88081E-11
Residual	622	3703.026603	5.953418976		
Total	623	3965.443348			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.435397142	0.19796369	27.45653578	2.5529E-109	5.046638971	5.824155313	5.046638971	5.824155313
X Variable 1	-1.038790489	0.156464356	-6.639151034	6.88081E-11	-1.346052879	-0.7315281	-1.346052879	-0.731528098

1-1Yr

Regression Statistics	
Multiple R	0.144525536
R Square	0.020887631
Adjusted R Square	0.019313495
Standard Error	5.48324592
Observations	624

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	398.9536779	398.9536779	13.26926981	0.000292288
Residual	622	18701.04318	30.06598582		
Total	623	19099.99686			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	10.36179919	0.44487709	23.29137514	9.34866E-87	9.488156129	11.23544225	9.488156129	11.23544225
X Variable 1	-1.280835714	0.351617042	-3.642700895	0.000292288	-1.971336069	-0.59033536	-1.971336069	-0.59033536

2-5Yrs

Regression Statistics	
Multiple R	0.046502568
R Square	0.002162489
Adjusted R Square	0.001502107
Standard Error	2.775231102
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	25.22068126	25.22068126	3.274601871	0.070558629
Residual	1511	11637.58249	7.70190767		
Total	1512	11662.80317			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.804840541	0.164511898	29.20664456	4.7077E-149	4.482144658	5.127536424	4.482144658	5.127536424
X Variable 1	-0.254036466	0.14038374	-1.809586105	0.070558629	-0.529404116	0.021331185	-0.529404116	0.021331185

2-1Yr

Regression Statistics	
Multiple R	0.109137681
R Square	0.011911033
Adjusted R Square	0.011257103
Standard Error	7.178300476
Observations	1513

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	938.5580196	938.5580196	18.21452533	2.09642E-05
Residual	1511	77858.80457	51.52799773		
Total	1512	78797.36259			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-1.255740281	0.42551982	-2.951073541	0.003215512	-2.090412395	-0.42106817	-2.090412395	-0.421068167
X Variable 1	1.549702085	0.363110902	4.267847856	2.09642E-05	0.837447261	2.261956909	0.837447261	2.261956909

3-5Yrs

Regression Statistics	
Multiple R	0.182234953
R Square	0.033209578
Adjusted R Square	0.032219014
Standard Error	0.980631655
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	32.23982341	32.23982341	33.52593027	9.47478E-09
Residual	976	938.5591211	0.961638444		
Total	977	970.7989445			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.914447599	0.079793464	49.057246	1.1408E-265	3.7578611	4.071034098	3.7578611	4.071034098
X Variable 1	-0.418740806	0.072319409	-5.790158052	9.47478E-09	-0.560660237	-0.27682138	-0.560660237	-0.276821375

3-1Yr

Regression Statistics	
Multiple R	0.279064097
R Square	0.07787677
Adjusted R Square	0.076931972
Standard Error	1.501237312
Observations	978

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	185.7665369	185.7665369	82.4268656	5.93343E-19
Residual	976	2199.624342	2.253713466		
Total	977	2385.390879			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-3.299617254	0.122154863	-27.01175517	1.9143E-120	-3.539333659	-3.05990085	-3.539333659	-3.059900849
X Variable 1	-1.005154219	0.110712921	-9.078924254	5.93343E-19	-1.222416984	-0.78789145	-1.222416984	-0.787891455



4-5Yrs

Regression Statistics	
Multiple R	0.242922285
R Square	0.059011212
Adjusted R Square	0.058390916
Standard Error	4.070556038
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1576.315493	1576.315493	95.13398048	7.67834E-22
Residual	1517	25135.81994	16.56942646		
Total	1518	26712.13543			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.293987479	0.240008508	30.3905371	7.68E-159	6.823203829	7.764771129	6.823203829	7.764771129
X Variable 1	-1.567622596	0.16072139	-9.753664977	7.67834E-22	-1.882882265	-1.25236293	-1.882882265	-1.252362928

4-1Yr

Regression Statistics	
Multiple R	0.245185028
R Square	0.060115698
Adjusted R Square	0.05949613
Standard Error	7.775836203
Observations	1519

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	5866.691958	5866.691958	97.0284465	3.12213E-22
Residual	1517	91723.32467	60.46362866		
Total	1518	97590.01663			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	21.11689965	0.458479586	46.05853842	1.8043E-290	20.21757864	22.01622065	20.21757864	22.01622065
X Variable 1	-3.024242313	0.307020268	-9.850301848	3.12213E-22	-3.626471474	-2.42201315	-3.626471474	-2.422013153

6-5Yrs

Regression Statistics	
Multiple R	0.16811581
R Square	0.028262926
Adjusted R Square	0.026944422
Standard Error	3.379471655
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	244.8124198	244.8124198	21.43560918	4.32416E-06
Residual	737	8417.150728	11.42082867		
Total	738	8661.963148			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	9.131190366	0.345100918	26.45947861	5.636E-109	8.453692381	9.80868835	8.453692381	9.80868835
X Variable 1	-1.035585382	0.223675283	-4.6298606	4.32416E-06	-1.474702017	-0.59646875	-1.474702017	-0.596468748

6-1Yr

Regression Statistics	
Multiple R	0.219150554
R Square	0.048026966
Adjusted R Square	0.046735279
Standard Error	6.750910155
Observations	739

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1694.543199	1694.543199	37.18159265	1.73597E-09
Residual	737	33588.61869	45.57478792		
Total	738	35283.16189			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	24.7772909	0.689381516	35.9413338	3.247E-164	23.42390538	26.13067643	23.42390538	26.13067643
X Variable 1	-2.724554569	0.446818881	-6.097671084	1.73597E-09	-3.601744038	-1.8473651	-3.601744038	-1.847365101

7-5Yrs

Regression Statistics	
Multiple R	0.305273612
R Square	0.093191978
Adjusted R Square	0.091337565
Standard Error	3.087040401
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	478.9130421	478.9130421	50.25416226	4.74963E-12
Residual	489	4660.081216	9.529818438		
Total	490	5138.994258			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	7.321893125	0.310013438	23.61798629	7.43669E-83	6.712770327	7.931015924	6.712770327	7.931015924
X Variable 1	-1.695159717	0.239124792	-7.089017017	4.74963E-12	-2.164998583	-1.22532085	-2.164998583	-1.225320851

7-1Yr

Regression Statistics	
Multiple R	0.273324808
R Square	0.074706451
Adjusted R Square	0.072814235
Standard Error	5.279236994
Observations	491

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	1100.347205	1100.347205	39.48093482	7.33484E-10
Residual	489	13628.59785	27.87034324		
Total	490	14728.94505			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	21.56877182	0.530162939	40.68328858	4.5513E-159	20.52709332	22.61045032	20.52709332	22.61045032
X Variable 1	-2.569491372	0.408934216	-6.283385618	7.33484E-10	-3.372976393	-1.76600635	-3.372976393	-1.76600635

8-5Yrs

Regression Statistics	
Multiple R	0.097151274
R Square	0.00943837
Adjusted R Square	0.007420933
Standard Error	7.68683915
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	276.4347107	276.4347107	4.678396088	0.031026196
Residual	491	29011.96059	59.08749611		
Total	492	29288.3953			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.977831522	0.896857509	6.665307993	7.1152E-11	4.21567941	7.739983634	4.21567941	7.739983634
X Variable 1	-1.139406347	0.526781046	-2.162960029	0.031026196	-2.174429551	-0.10438314	-2.174429551	-0.104383142

8-1Yr

Regression Statistics	
Multiple R	0.037086703
R Square	0.001375424
Adjusted R Square	-0.000658435
Standard Error	18.46807349
Observations	493

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	230.6528751	230.6528751	0.676263089	0.411275665
Residual	491	167465.2416	341.0697386		
Total	492	167695.8945			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	9.501276216	2.154751786	4.409452763	1.27416E-05	5.267604342	13.73494809	5.267604342	13.73494809
X Variable 1	1.040786818	1.265621784	0.822352169	0.411275665	-1.445916004	3.527489641	-1.445916004	3.527489641

*Not included in study:*

5-5Yrs

Regression Statistics	
Multiple R	0.142699987
R Square	0.020363286
Adjusted R Square	0.019933621
Standard Error	3.294581669
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	514.4204436	514.4204436	47.39337796	7.48073E-12
Residual	2280	24747.7319	10.85426838		
Total	2281	25262.15234			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	5.939755822	0.15957474	37.22240644	2.3265E-237	5.62682896	6.252682684	5.62682896	6.252682684
X Variable 1	-0.783381657	0.113792743	-6.884284855	7.48073E-12	-1.006529795	-0.56023352	-1.006529795	-0.560233519

5-1Yr

Regression Statistics	
Multiple R	0.048241065
R Square	0.0023272
Adjusted R Square	0.001889625
Standard Error	8.996155119
Observations	2282

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	430.4218973	430.4218973	5.318393745	0.021190753
Residual	2280	184522.2398	80.93080693		
Total	2281	184952.6617			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	15.60157373	0.435733351	35.80532378	3.5992E-223	14.74709845	16.45604901	14.74709845	16.45604901
X Variable 1	-0.716574695	0.310721442	-2.306164293	0.021190753	-1.325900996	-0.10724839	-1.325900996	-0.107248394