Spring 5-2019

The Relationship Between Manager Tenure and Corporate Bond Mutual Fund Performance

Matthew Mottes
University at Albany, State University of New York, mmottes@albany.edu

Follow this and additional works at: https://scholarsarchive.library.albany.edu/ honorscollege_finance

Part of the Finance and Financial Management Commons

The Relationship Between Manager Tenure and Corporate Bond Mutual Fund Performance

An honors thesis presented to the
Department of Finance,
University at Albany, State University of New York
in partial fulfillment of requirements
for Graduation with honors in Financial Analysis
and
Graduation from The Honors College

Matthew Mottes

Research Advisor: Ying Wang, Ph.D.

December 2018

Abstract

This paper analyzes the relationship between manager tenure and performance in corporate bond mutual funds, using a sample from Morningstar of 665 funds from 2002-2017. Based on a univariate portfolio analysis and panel regressions, the results show a significant positive relationship between average manager tenure and corporate bond performance generally, regardless of whether performance is measured by raw monthly returns or Fama and French's (1993) five-factor alpha. However, in the crisis periods, this paper documents a significant negative relationship between average manager tenure and fund performance.

Keywords: Manager tenure, corporate bond funds, experience, fund performance

Acknowledgements

Many people have helped me throughout the process of writing my thesis. I would first like to thank my faculty advisor Professor Wang. She helped keep the whole process of writing and completing this thesis extremely smooth. I would also like to thank all of the other professors in the University's finance department and elsewhere for giving me the skills necessary to complete this project. Lastly I would like to thank my parents for giving me the work ethic and dedication needed to finish a thesis like this.

List of Figures

List of Tables

Table of Contents

1. Introduction

While there is a large amount of literature on the performance of mutual funds, the amount of literature based solely on corporate bond mutual funds is limited. With the current market environment and demographics of the population, this may be a mistake. According to ICI Factbook, bond mutual funds in 2017 experienced their largest net inflow of the past 5 years. These bond mutual fund inflows can be seen in Figure 1, which shows increasing net new cash flows in bond mutual funds over the last 3 years.
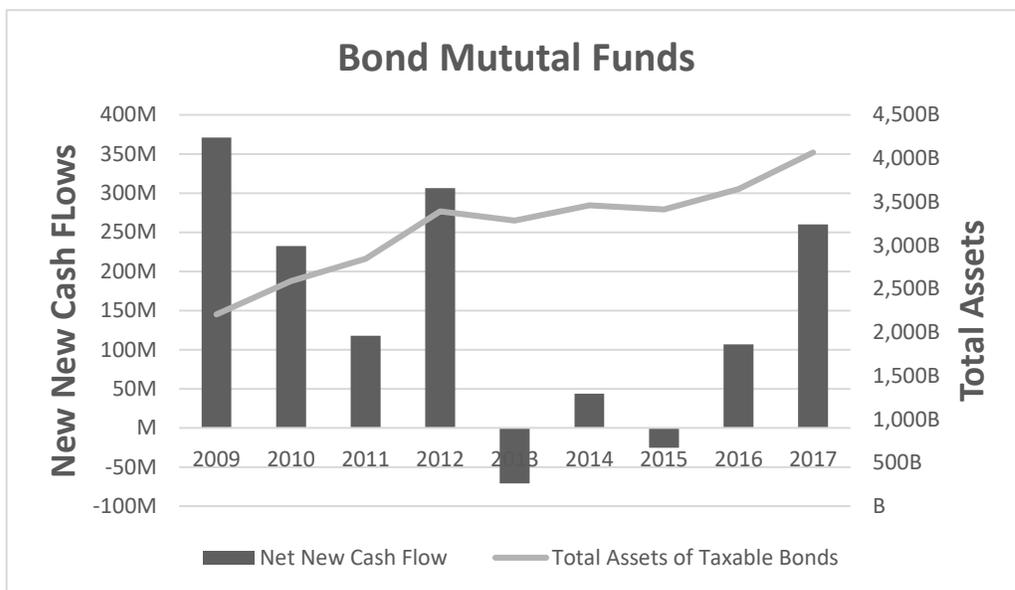
Figure 1

It shows a $260 billion inflow in 2017 compared to a $107 billion inflow in 2016. Of this $260 billion, $202 billion went into corporate bond mutual funds. Additionally, although U.S. equity mutual funds account for $10.3 trillion of the $18.7 trillion in total mutual fund assets, these funds had a $236 billion net outflow in 2017. Figure 1 also shows that the total assets of corporate bond mutual funds have been growing over the past three years. These numbers make studies on bond mutual funds more important now than they have been in the past due to the

recent growth. The last number to note is that active management accounted for 65% of U.S. mutual funds outstanding in 2017. This shows that while many believe that there is no value in active management, investors still have a high percentage of their assets in active funds. For this reason, active management in both the equity market and bond markets should be studied, even if it may not actually be beneficial to the investor.

Many studies have been done on different aspects of active management in the mutual fund industry regarding how different variables affect performance. For example, one study (Bliss et al., 2008) found that mutual funds managed by teams had no difference in performance than mutual funds managed by individuals. Other studies have been conducted based on the merit of the manager. For example, Chevalier and Edison (1999) found that managers that went to high-SAT undergraduate schools experienced better risk-adjusted returns than their peers, and Yuhong and Mazumder (2017) found that managers with either a CFA or MBA performed better than managers without either. These studies were both performed on active mutual funds, regardless of classification. This paper's aim will be to examine only corporate bond mutual funds and whether the average tenure of the manager, or managers, running a mutual fund affects the performance of that fund. This is important because as detailed above, investors still have an interest in active mutual funds, and they should have all the information possible regarding what factors can influence a mutual fund's return. This study will focus on corporate bond mutual funds for two reasons. The first reason, mentioned above, is due to the increasing inflows corporate bond mutual funds have received over the past three years, and also as a result of the possible growth in the bond market in the near future. This growth may stem from the fact that baby boomers are reaching retirement age and will likely be moving more of their retirement into bond mutual funds. Another driver of possible increased assets in bond mutual funds is the fact

that interest rates may continue to be raised over the next few years with the economy showing strong growth and analysts predicting two rate hikes in 2019. As interest rates go up, more investors will look to active bond mutual funds to invest their money and get the best yield possible. These points make it interesting to analyze whether funds with longer average manager tenure have outperformed funds with shorter average manager tenure in the past, which may indicate that investors in the future may want to consider a bond mutual fund's average manager tenure before deciding which fund to invest in.

The results of this paper show a significant positive relationship between average manager tenure and performance in most cases. The only case where this differs is during the crisis period where longer tenured funds' performance actually had a statistically significant negative relationship with average manager tenure. The pre and post-crisis periods, however, show a stronger positive relationship between tenure and performance than the full-time period. In general, the relationships between average manager tenure and performance is stronger in investment-grade funds. This may be due to a smaller number of funds in the high yield sample. Still, the relationship is statistically significant in most cases, specifically when looking at the regression for solely investment grade funds, compared to solely high yield funds, where the regression shows no statistically significant relationship.

This paper has some contribution to past literature. It is one of the first papers to strictly look at manager tenure and performance using multiple techniques and looking at multiple time periods. It also documents convincing evidence that a fund's average manager tenure has a positive relationship with performance in corporate bond mutual funds, and specifically investment grade corporate bond mutual funds.

The rest of the paper proceeds as follows. Section 2 highlights past research on the topic of persistence in mutual funds, and on the topic of manager tenure and how it affects mutual fund performance. Section 3 outlines the formation of the hypothesis and what different results would imply about it. Section 4 outlines the data and key variables that will be used in the empirical analysis to test the hypothesis. Section 5 details the methods of analysis that will be used to study the relationship between tenure and performance. In Section 6, the main empirical results of the paper regarding manager tenure and expected corporate bond returns are presented. Section 7 is the conclusion of the paper.

2. Literature Review

This section talks about the research that is relevant to the topic of manager tenure and corporate bond mutual funds. Section 2.1 talks about studies that have been done on the topic of persistence. It also talks about studies that research the difference in performance of active and passive on mutual fund performance. The characteristic in focus in this section is manager tenure funds. Section 2.2 discusses research related to manager characteristics and their effects.

2.1 Active versus Passive Management

The first research that should be acknowledged is in the area of persistence, which investigates whether specific mutual funds or managers are able to achieve positive performance over a long period of time. It is also important to note research on persistence specifically in bond mutual funds. Several papers agree that active management is not beneficial, and persistence does not exist. One paper (French, 2008), finds that active management costs investors 67 basis points a year relative to passive management, as an argument against persistence. French looked at the period from 1980 to 2006. Another paper (Cici & Gibson, 2012), finds no evidence that bond fund managers are able to select bonds that outperform other

4

bonds with similar characteristics, concluding that there is not persistence, and investors should

avoid active management. While acknowledging this research, it seems that academics are more

likely to believe that there is persistence in bond mutual funds compared to equity mutual funds.

Timmermann and Wermers (2006) find that, contrary to most studies, a sizable minority of

managers are able to pick securities well enough to cover their costs and have positive alpha in

all mutual funds. This study uses a bootstrap analysis to arrive at this conclusion. They find this

necessary to make a proper conclusion because it helps combat the fact that individual funds

exhibit normally distributed returns at times. This analysis evaluates the cross-sectional

distribution of alphas in mutual funds, incorporating an analysis of a complicated mixture of

fund alpha distributions in individual funds. Additionally, both Huang and Blanchfield (2009)

and Moneta (2015) find that there is definitely evidence of short-term persistence in bond mutual

funds, and Moneta even found that bond mutual funds from 1997-2006 were able to outperform

their benchmarks before costs and fees by an average of 1%. Moneta was able to find this by

studying U.S. bond mutual funds using a method that revolves around a novel data set of

portfolio weights. This result is important to this paper because it shows that there may be some

benefit to active management in bond mutual funds, which makes the topic of manager tenure

and performance in active bond mutual funds more interesting.

2.2 Relationship Between Tenure and Performance

The literature regarding whether manager tenure has any effect on performance is split,

and no studies have been done solely on corporate bond mutual funds. Golec (1996) shows

evidence that manager tenure is the most significant predictor of performance, and that for each

year tenure goes up, performance goes up by 5 basis points per year. He finds this using a three-

stage least squares regression in which he simultaneously studies a mutual fund's risk and fees.

This study analyzes all mutual funds, including equity and bond mutual funds, during the period of 1988-1990. A similar study by Kaushik (2010) finds that tenure positively affects performance by 6 basis points per year. This study looks at a bigger dataset of monthly returns by also analyzing monthly returns from active mutual funds during the period 1999-2007. Quiang (2011) finds that tenure could both positively and negatively affect mutual funds returns. He found that during down markets with higher volatility longer-tenured managers have better performance, but that during boom markets with lower volatility this advantage becomes weaker and even negative in some markets. His study looked at mutual fund returns from 2000 to 2009. Another study found that tenure positively influences risk and fee-adjusted returns using panel regressions (Payne et. al., 1999). While these are adjusted returns, they certainly are a measure of a manager's performance which makes the results of this paper support the hypothesis that longer-tenured managers have higher performance.

Some studies find that tenure has no effect on performance. Fortin et. al. (1999) finds no relationship, but he does find that as tenure goes up, a fund is expected to have lower turnover, lower expenses, and higher assets under management. In his analysis he splits up the funds into two baskets, one made up of funds with managers that have over 10 years of experience, and one made up of funds that have managers with less than 5 years of experience. He removes the sample in the middle to avoid confounding the data. Studies by Redman and Gullet (2006) and Yuhong and Long (2012) find that manager tenure has no effect on taxable or municipal bond mutual funds, or U.S. based international funds, respectively. Redman and Gullet look at monthly fund returns from 1997 to 2001. They then perform a regression analysis of the data controlling for things like fund size and expense ratios. Yuhond and Long also use a regression and control for many of the same factors but using monthly return data during the period 2005-

2009. Kjetsaa and Kieff (2016) did a similar study on blend only mutual funds and find no significant relationship between tenure and performance. The main analysis on tenure in Kieff's study is conducted looking at the difference in means of separate portfolios made up of managers with different lengths of tenure, while also controlling for expense ratios.

Porter and Trifts performed two studies (2012 and 2014) on how experience affects mutual fund performance. The 2012 study uses a regression and focuses more on absolute performance, while the 2014 study uses multiple methods, all focused on relative performance against funds of the same style. Both studies have similar conclusions. The 2012 study finds that managers of ten years or greater perform above the market at a higher percentage than managers in their first three years. The 2014 study finds that managers of ten or more years have stronger monthly-adjusted performance when compared to managers of one, two, and three years. This 2014 study also found that when comparing a manager of four, five, six, seven, eight, or nine years of tenure against managers with over ten years of tenure there is no difference in returns. This study also finds that in managers' last year at a fund, they perform significantly worse than the managers that have over ten years of experience. Another study (Kempf et al., 2009) finds that a fund's relative performance against its peers had a much more significant effect on managers achieving longevity than anything else. This means that for managers to have longevity in their career, they had to not underperform their peers, rather than outperform their peers. Kempf concluded that this causes many managers to herd up into similar assets and adjust their risk to match other funds. For comparison to another industry, Brown et al. (2001) finds evidence of this same herding behavior in hedge funds and commodity trading advisors, concluding that managers were much more concerned with how other comparable managers

perform, rather than the performance of the market because they realized that they only have to

keep up with these comparable managers' performance in order to keep their jobs.

3. Hypothesis

When forming the hypothesis for this paper it is important to take into account all of the

previous studies and data that have been found. For this reason, both absolute performance and

relative performance against other managers will be assessed. Performance against other

managers will be looked at because, as Porter and Trifts (2012 & 2014), Kempf (2009), and

Brown et al. (2001) found, managers like to gauge themselves against other managers. The null

hypothesis in this paper, H_0, is that there is not a positive relationship between managerial tenure

and fund returns. Previous papers have found this to be true in all mutual funds which makes it a

good starting point. Other papers have also found that tenure does have a relationship with

performance in mutual funds, in addition to this, common sense says that if there was any

relationship to be expected, it would be a positive relationship between manager tenure and

returns. This is because as tenure increases it is assumed that experience increases which may

give longer-tenured managers a better chance of outperforming. This positive relationship will be

considered H_1. An interesting result to also consider is that there is a negative relationship

between manager tenure and performance. After analyzing H_0 we will be able to see if this is a

possibility. This would be a surprising relationship, but could maybe have some explanations.

The alternative hypothesis is show below.

H_1: There is a positive relationship between managerial tenure and corporate bond mutual
fund returns.

A rejection of H_0 would imply that manager tenure does have a positive relationship with

corporate bond mutual fund performance. This could imply that the bond market is too efficient

for a manager, regardless of his experience, to outperform other managers. This could also imply that managers are able to keep their jobs for reasons other than outperformance. A rejection of the null hypothesis may support H_1, which implies that as managerial tenure goes up, a manager's expected performance also goes up. This means that a manager with 4 years of experience is more likely to have a higher return than a manager with 1 year of experience. A rejection of H_0 could also have the surprising result of implying the opposite, that as managerial tenure increases expected return decreases. One explanation for this could be that as a manager's tenure increases, their job security increases as well, which may cause them to work less. Another explanation could be that as a manager's tenure increases, their confidence increases causing them to possibly become overconfident leading to a decline in performance.

4. Data

This section outlines a description of the data and variables used in the paper. Section 4.1 outlines the sample of funds that are studied. Section 4.2 discusses some of the statistics of the sample when it is broken down into different pieces. Section 4.3 lays out some of the variables that will be important to better understand the results of the empirical analysis in section 5.

4.1 Corporate Bond Sample

The dataset used in this analysis was provided by Morningstar. It contains corporate bond mutual funds, excluding all other mutual funds such as equity, blend or government mutual funds. For each fund, monthly net returns from the period of 2002-2017 are used. To avoid survivorship bias, this includes funds that opened or closed inside of those dates. To avoid having a fund that has an overly high or low average monthly return due to a small sample size, and to allow the calculation of a funds alpha, funds with less than 12 months of monthly returns have been taking out of the sample. This period is a good period to look at because it contains a

recession in 2008 and 2009, making the sample more dynamic. To control for the variety of fund

configurations that could refer to the same fund, only the oldest share class for each fund was

used. Also, all funds that did not have a manager name and an average tenure were excluded.

The sample does contain funds that are team managed. For this reason, the main independent

variable being looked at is average manager tenure. It seemed appropriate not to exclude team

managed funds because over 70% of corporate bond mutual funds are run by multiple managers,

which makes this group of funds important to include. The sample contains six Morningstar

categories for taxable bonds, but in this analysis, the funds are separated into two categories,

High-Yield and Investment Grade. In total there are 665 funds the sample.

4.2 Summary Statistics

Table 1, Panel A:			
Fund Type:	**High Yield:**	**Inv. Grade:**	**Total:**
Number of Funds:	179	486	665
Average Monthly Return:	0.53%	0.25%	0.33%
Average Assets:	229,622	471,996	406,203
Average Assets (2017):	248,426	669,653	552,870
Average Turnover:	93.76%	168.11%	148.04%
Average Expense Ratio:	1.72%	3.09%	2.70%

Table 1, Panel B:			
Fund Type:	**Less than 4**	**4 to 8**	**8 and Over**
Number of Funds:	185	262	218
Average Monthly Return:	0.29%	0.33%	0.36%
Average Assets:	434,064	402,243	395,868
Average Assets (2017):	498,991	553,822	612,260
Average Turnover:	125.37%	165.75%	145.55%
Average Expense Ratio:	2.27%	4.23%	118.00%

Summary statistics of the sample can be seen in Table 1. Panel A shows the statistics on

the sample sorted into high yield funds and investment grade funds. It shows there are over twice

as many investment-grade funds as high-yield funds. The statistics for average assets are broken down into two types. The first type, Average Assets, is an average of the monthly time series data of assets for each fund over the period from 2002-2017. The second type, Average Assets (2017), is the average assets in 2017 for the funds that were still in operation that year. These rows in Panel A show that investment grade funds are, on average, more than double the size of high yield funds. The panel also shows that investment grade funds have higher turnover and higher expenses, on average, than high yield funds. Lastly, the table shows that high yield funds have a higher average monthly return than investment grade funds, which makes sense because high-yield bonds are inherently riskier. Panel B shows the same descriptive statistics as Panel A, but the sample is broken down by a fund's average manager tenure. The first group consists of funds with an average manager tenure of fewer than four years. The second group consists of funds with average manager tenure of four to eight years, not including eight. The third group consists of funds with an average manager tenure of eight years and over. One interesting statistic that the panel shows is that the average 2017 assets for funds go up as average manager tenure goes up. Another interesting point that this table shows is that the average expense ratio and average turnover is highest for the middle group of managers. The last intriguing observation is that the average monthly return goes up as the groups increase in managerial tenure. This is the positive relationship between managerial tenure and performance that one might expect, but of course, this result alone does not prove that there is a significant positive relationship. The standard deviation of the monthly returns for the entire sample is .22%. Using this number to calculate the standard error of the sample, and then calculating a t-statistic of the 8 and over group versus the two other groups, it is found that the difference between these returns is statistically significant at the 1% level. This may support the inference that managers with longer

tenure perform better, but it does not control for any variables and is only a cross-sectional

analysis which means that it may not have any significance. Figure 2 shows a histogram of the

Figure 2

Average Manager Tenure

Bar values left to right: ≤1.00: 11; (1.00, 2.80]: 80; (2.80, 4.60]: 141; (4.60, 6.40]: 137; (6.40, 8.20]: 97; (8.20, 10.00]: 75; (10.00, 11.80]: 41; (11.80, 13.60]: 25; (13.60, 15.40]: 25; (15.40, 17.20]: 18; (17.20, 19.00]: 6; (19.00, 20.80]: 5; (20.80, 22.60]: 3; (22.60, 24.00]: 2; > 24.00: 2
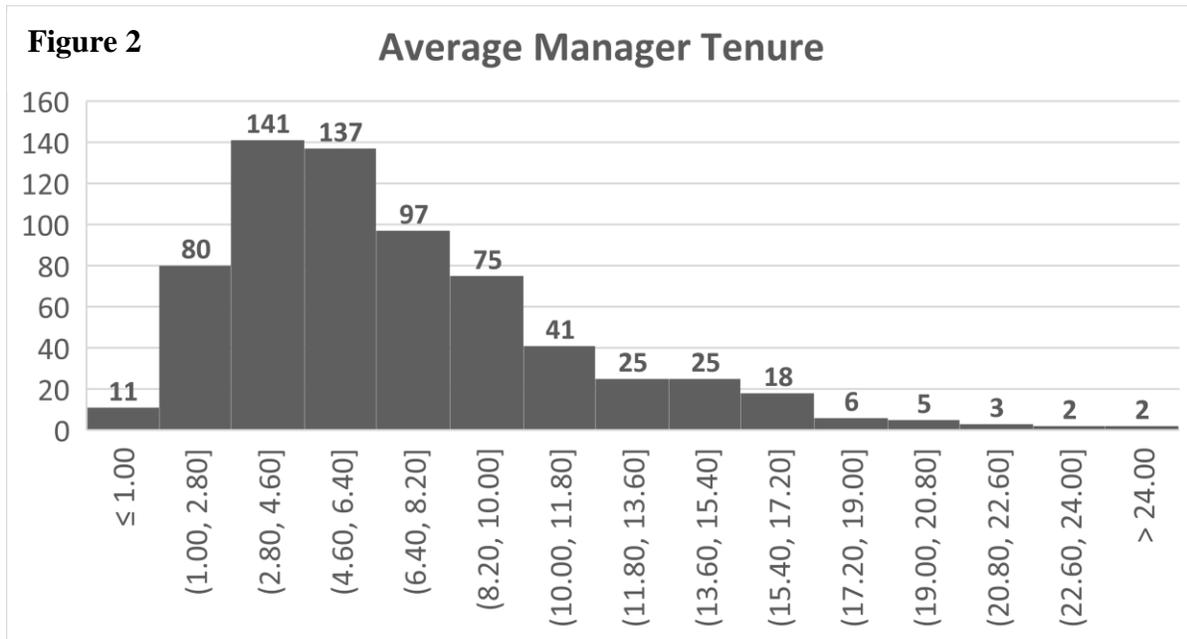
average manager tenure of these 665 funds. It shows that the distribution for average manager

tenure is skew right with the most observations lying from 2.8 to 4.6 years of average manager

tenure.

5. Methodology

This section will clearly outline the two methods of analysis that will be used to

determine whether manager tenure has a relationship with corporate bond mutual fund

performance. Section 5.1 explains some the performance measures and variables that are used.

Section 5.2 explains how the univariate portfolio analysis is conducted. Section 5.3 explains how

the panel regressions are performed.

5.1 Variable Definitions

The methodologies used in this analysis will be based on net monthly returns of the

mutual funds in the sample. Using monthly returns will provide a much larger sample than using

yearly returns, allowing the analyses to be stronger. Also, the net returns are looked at because this analysis is not concerned with the expenses that a particular mutual fund chooses to have, and by using net returns as opposed to gross returns, this factor is stripped out. In the univariate analysis, these monthly returns form the "Raw Return," which is the net monthly return with no adjustments. In addition to this return, an alternative to evaluating corporate bond returns is also used. This is Fama and French's (1992) five-factor model:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{i,MKT}\, MKT_t + \beta_{i,SMB}\, SMB + \beta_{i,HML}\, HML_t + \beta_{i,term}\, TERM$$
$$+ B_{i,DEF}\, DEF_t + E_{i,t},$$

where MKT, SMB, and HML are the Fama-French three factors, Term is the term spread factor that shows the interest rate risk of bonds, and DEF is a default spread factor that shows the default risk premium. This five-factor alpha will be the dependent variable in both the univariate and regression analyses in this paper. The other dependent variable that will be seen in the regression analyses is "Excess Return." This is the monthly return minus the risk-free rate. The other variables in the regression results are as follows.

5.2 Portfolio Analysis

In the portfolio analysis, the sample of funds is split into 3 groups (portfolios) each month based on average manager tenure. Although tenure is a snapshot variable, funds can be in different groups at different times due to the sample size in each month changing. The portfolios are rebalanced to equal weight each month. This is then used to find the raw monthly returns, as well as the Fama-French (1993) five-factor alphas of each portfolio. The difference between portfolio 3, comprised of the highest tenured funds, and portfolio 1, comprised of the shortest tenured funds is then looked at. The t-statistics for the three portfolios, and also the difference between portfolio 3 and portfolio 1 (3-1), are all looked at to check for significance. This

analysis is similar to Fortin's (1999) analysis, which also created "portfolios" in a similar way and looked at the difference between the top and bottom group. Fortin also noted that it was important to take out the middle portfolio, portfolio 2, because of how it may confound the data.

In addition to this 3-portfolio analysis, a portfolio analysis that splits the sample into two groups is also looked at. These results may be useful because each portfolio is made up of more funds, and they also will allow for another look into the data. This method may also shine a light on whether or not removing a middle section of funds has an effect on the results. Both the 3-portfolio and 2-portfolio analyses, and all the following univariate analyses, will also contain results for when the sample is split up into investment grade and high yield funds.

The sample will also be looked at when split up into time periods. This study will look at three different time periods, the first is the time period from July 2007 until February 2009. This time period was chosen to include the months of the recession caused by the financial crisis of 2007-2009. This was a time of heightened volatility and could show interesting results regarding manager tenure's affect, specifically when the markets are experiencing a multitude of ups and downs. The next time period is the "pre-crisis" period from January 2002 until June 2007. This time period includes data from a strong market and economy leading up to the crisis. The last time period is the "post-crisis" period from March 2009 until December 2017. This is similar to the pre-crisis time period due to them both having relatively low volatility. Each of these time periods also breaks down the sample into investment grade bond funds and high yield bond funds. This is important because investment grade funds and high yield funds have different characteristics, expected returns, and possibly attract different types of managers and investors, making the similarities and differences between the results of the two groups along with the results from the full sample of funds interesting.

5.3 Panel Regressions

This analysis is similar to the way Bu (2011) looks at the effect of mutual fund tenure in the total mutual fund market. It includes panel regressions which look at the effect of average manager tenure, log of total net monthly assets, new monthly flows, yearly turnover, and expense ratios on both excess returns (return – risk-free rate) and Fama-French's (1993) five-factor adjusted alphas. This analysis will add some robustness to the study by not having it rely only on the univariate analysis. Log of total net monthly assets, net monthly flows, yearly turnover, and yearly expense ratio are all lagged by one period. Controlling for these variables will help prevent confounding the study, because other variables may affect both the dependent variable of monthly return and the other independent variables. This analysis will make it easy to see whether the panel regression finds average manager tenure to have a positive relationship with net monthly performance and five-factor alpha. It will also be easy to see how well the regression fits the data and how much inference can be put into the results if any at all. While not directly related, this method will also allow for some analysis of the control variables and their effects on both excess-adjusted return and five-factor adjusted alpha. The regression formula is shown below.

$$R = \alpha_i + B_{i,Tenure} \, Tenure + B_{i,Log(Assets)} \, Log(Assets) + B_{i,Monthly\ Flow} \, Monthly\ Flow + B_{i,Turnover} \, Turnover + B_{i,Expense\ Ratio} \, Expense\ Ratio$$

These panel regressions will also be loosed at in different time periods and with high yield funds only and investment grade funds only. This is important because of the different characteristics of the two types of funds and the securities in those fund types. The different time period analyses in both the univariate analysis and the regression analysis will also allow a comparison to Quiang's (2011) study which found that the positive relationship between manager tenure is stronger and more significant in periods of higher volatility.

15

6. Empirical Results

This section presents the findings from both the univariate portfolio analysis and the panel regressions analyses. Subsection 1 includes the univariate results with its subsections each representing a specific time period. Subsection 1 then wraps up with a more consolidated conclusion from the univariate analysis. Subsection 2 includes the panel regressions results, with the subsections each representing a specific time period. This section also wraps up with a consolidated conclusion from the portfolio analysis.

6.1 Univariate Analysis

This subsection talks about the univariate portfolio analyses. The methodology for these analyses are described in section 5.2. The subsections break down the results based upon time periods in order to make the results more easily located. These results are shown in Table 2, Table 3 and Table 4, which show the univariate analysis results when looking at three groups, and Table 5, which shows the results from the portfolio analysis when looking at two groups.

6.1.1 Full-Time Period 2002-2017

Table 2 shows the results from the main portfolio analysis. Columns 1 – 3 show the results for each portfolio with the difference being shown in the column titled "3-1". The table shows the raw return and five-factor alpha for each column 1-3 with the last column showing the difference. The t-statistics for these numbers are shown below. Based on raw results, portfolio 3 generates returns of 37 basis points per month, while portfolio 1 generates returns of 36 basis points per month. It is also interesting that portfolio 2 has the highest returns at 39 basis points per month. When looking at the difference between portfolio 3 and portfolio 1, although it is small, the t-statistic of 2.38 signals that this difference is statistically significant at the 5% level.

Table 2:	1	2	3	3 - 1
Raw Return:	0.36	0.39	0.37	0.02**
	(5.52)	(5.21)	(5.46)	(2.38)
Five Factor Alpha:	0.11	0.13	0.13	0.01*
	(2.11)	(2.13)	(2.25)	(1.96)

Table 3:	Group 1: Investment Grade Funds				Group 2: High Yield Funds:			
	1	2	3	3 - 1	1	2	3	3 - 1
Raw Return:	0.28	0.30	0.29	0.01	0.60	0.58	0.62	0.01
	(5.13)	(5.13)	(5.16)	(1.19)	(4.31)	(4.20)	(4.40)	(1.20)
Five Factor Alpha:	0.06	0.07	0.07	0.00	0.30	0.28	0.30	0.01
	(1.34)	(1.35)	(1.41)	(0.44)	(2.75)	(2.59)	(2.81)	(0.47)

Table 4:

Panel A: Crisis Period (July 2007 - February 2009)

	Group 1: All Funds				Group 2: Investment Grade Funds				Group 3: High Yield Funds:			
	1	2	3	3 - 1	1	2	3	3 - 1	1	2	3	3 - 1
Raw Return:	-0.02	-0.14	-0.09	-0.07*	0.10	0.07	0.02	-0.08***	-0.56	-0.50	-0.51	0.05**
	(-0.06)	(-0.40)	(-0.29)	(-2.07)	(0.37)	(0.26)	(0.07)	(-3.90)	(-0.92)	(-0.80)	(-0.82)	(2.47)
Five Factor Alpha:	0.14	0.15	0.13	-0.02	0.09	0.07	0.04	-0.06	0.31	0.39	0.39	0.08
	(0.74)	(0.84)	(0.74)	(-0.42)	(0.39)	(0.30)	(0.16)	(-2.33)	(1.43)	(1.64)	(1.70)	(3.27)

Panel B: Pre-Crisis

	Group 1: All Funds				Group 2: Investment Grade Funds				Group 3: High Yield Funds:			
	1	2	3	3 - 1	1	2	3	3 - 1	1	2	3	3 - 1
Raw Return:	0.38	0.44	0.41	0.03***	0.31	0.31	0.33	0.02	0.70	0.67	0.74	0.04**
	(4.07)	(4.04)	(4.36)	(3.13)	(3.34)	(3.26)	(3.64)	(1.63)	(3.34)	(3.35)	(3.66)	(2.23)
Five Factor Alpha:	0.02	0.04	0.04	0.02***	-0.01	-0.02	-0.01	0.01	0.15	0.14	0.21	0.06
	(0.37)	(0.52)	(0.82)	(3.49)	(-0.39)	(-0.64)	(-0.24)	(0.74)	(0.92)	(0.95)	(1.34)	(3.43)

Panel C: Post-Crisis

	Group 1: All Funds				Group 2: Investment Grade Funds				Group 3: High Yield Funds:			
	1	2	3	3 - 1	1	2	3	3 - 1	1	2	3	3 - 1
Raw Return:	0.41	0.46	0.44	0.03***	0.30	0.33	0.32	0.02**	0.77	0.74	0.76	-0.01
	(5.05)	(4.95)	(5.01)	(2.98)	(4.69)	(4.78)	(4.77)	(2.35)	(4.44)	(4.21)	(4.26)	(-0.79)
Five Factor Alpha:	0.08	0.08	0.08	0	0.05	0.06	0.07	0.02	0.15	0.12	0.10	-0.05
	(1.26)	(1.17)	(1.27)	(0.57)	(1.10)	(1.38)	(1.46)	(2.30)	(1.31)	(0.96)	(0.84)	(-2.95)

Looking at the five-factor alpha, it shows that portfolio 3 also has a higher number than portfolio 1, with the t-statistic of the difference resulting in a value of 1.96, which signals a statistically significant difference at the 10% level. Table 3 shows the results of the univariate analysis when the sample is split into high yield and investment grade. The results are split into Group 1 and Group 2 and each group has the results from Table 2. These groups show that in both investment grade and high yield funds individually there is not statistically significant differences between

Table 5:

Panel A: Full Time Period (2002-2017)

	Group 1: All Funds			Groups 2: Investment Grade Funds			Group 3: High Yield Funds:		
	1	2	2 -1	1	2	2 -1	1	2	2 -1
Raw Return:	0.367	0.379	0.01*	0.29	0.29	0.00	0.599	0.604	0.01
	(5.48)	(5.34)	(1.75)	(5.21)	(5.08)	(-0.30)	(4.28)	(4.33)	(0.45)
Five Factor Alpha:	0.12	0.129	0.01*	0.07	0.06	0.00	0.29	0.29	0.00
	(2.13)	(2.21)	(1.76)	(1.41)	(1.33)	(-0.53)	(2.69)	(2.75)	(0.36)

Panel B: Crisis Period (July 2007-February 2009)

	Corporate Bond Funds			Investment Grade Funds			High Yield Funds		
	1	2	2 -1	1	2	2 -1	1	2	2 -1
Raw Return:	-0.053	-0.116	-0.06*	0.11	0.02	-0.08***	-0.541	-0.503	0.04
	(-0.17)	(-0.35)	(-1.89)	(0.38)	(0.08)	(-4.30)	(-0.88)	(-0.82)	(1.48)
Five Factor Alpha:	0.142	0.138	0	0.09	0.03	-0.06***	0.33	0.40	0.06*
	(0.76)	(0.79)	(-0.14)	(0.41)	(0.15)	(-3.24)	(1.46)	(1.72)	(2.14)

Panel C: Pre-Crisis

	Corporate Bond Funds			Investment Grade Funds			High Yield Funds		
	1	2	2 -1	1	2	2 -1	1	2	2 -1
Raw Return:	0.398	0.424	0.03***	0.32	0.32	0.00	0.679	0.719	0.04**
	(4.06)	(4.31)	(3.12)	(3.34)	(3.49)	(0.36)	(3.29)	(3.62)	(2.28)
Five Factor Alpha:	0.021	0.041	0.02***	-0.01	-0.02	0.00	0.14	0.20	0.06***
	(0.39)	(0.76)	(3.85)	(-0.38)	(-0.49)	(-0.48)	(0.87)	(1.28)	(3.23)

Panel D: Post-Crisis

	Corporate Bond Funds			Investment Grade Funds			High Yield Funds		
	1	2	2 -1	1	2	2 -1	1	2	2 -1
Raw Return:	0.426	0.445	0.02**	0.31	0.32	0.01	0.765	0.741	-0.02*
	(5.09)	(4.92)	(2.06)	(4.75)	(4.75)	(1.48)	(4.40)	(4.21)	(-1.82)
Five Factor Alpha:	0.077	0.078	0.001	0.05	0.07	0.01*	0.15	0.10	-0.04**
	(1.27)	(1.20)	(0.08)	(1.17)	(1.46)	(1.81)	(1.24)	(0.84)	(-2.54)

raw returns or five-factor alpha. Table 5 Panel A Group 1 shows the results from the two-group analysis. It reports similar, but weaker, results showing the difference between portfolio 2 and portfolio 1 to be statically significant for both performance metrics at the 10% level.

6.1.2 Crisis Time Period July 2007 – February 2009

Table 4 Panel A shows the results from the portfolio analysis during recession time. It contains three groups, each with the same format as Table 2. The results contrast Quiang's (2011) research. Table 4 shows that, while the five-factor alpha difference is not statistically significant in any of the groups, the raw return difference is statistically significant in each group. For Group 1 containing all funds, the table shows that the highest tenured portfolio actually performs 7 basis points worse than the lowest tenured portfolio. The t-statistic for this difference is -2.07, which is significant at the 10% level. Group 2, containing investment grade funds, displayed a raw return difference of -8 basis points. This difference is significant at the 1% level. What is interesting is that when only looking at high yield funds, Group 3, longer-tenured funds still perform better than shorter tenured funds by 5 basis points, with the difference being significant at the 5% level. Table 5 Panel B shows the results when only using two groups, the results show the same negative relationship in Groups 1 and 2, and a positive relationship in Group 3.

6.1.3 Pre-Crisis January and Post-Crisis Periods

Table 4 Panel A and Panel B show the results from the portfolio analyses with 3 groups in the pre-crisis and post-crisis periods respectively. The results from these panels are similar to each other and to the results from the full-time period analysis. Group 1 of both Panel B and Panel C show a 3-basis point difference in monthly raw returns between the longest-tenured funds and shortest tenured funds. These differences are significant at the 1% level. The raw return difference in the investment grade group is 2 basis points and it is also significant at the 5% level. Table 7 Panel C and Panel D show the univariate portfolio analysis during the pre and post-crisis time periods, and the results support the univariate analysis using 3 groups.

When looking at all the results, they show that average manager tenure is significantly positively associated with raw returns. This is shown by a positive different in the majority of the "3-1" columns of the tables. Many of these differences are also statistically significant. This being said, in relatively shorter periods of high volatility this positive relationship may not hold true and even become negative, specifically in investment grade funds. This relationship is seen in Table 4 panel A.

6.2 Panel Regressions

This subsection talks about the univariate portfolio analyses. The methodology for these analyses is described in section 5.3. The subsections break down the results based upon time periods in order to make the results more easily located. The results of these regression analyses are shown in Table 6, Table 7, Table 8, and Table 9.

Table 6:	Panel A: All Funds		Panel B: Investment Grade		Panel C: High Yield	
	Risk - Adjusted:	Factor Adjusted:	Raw Returns:	Factor Adjusted:	Raw Returns:	Factor Adjusted:
Intercept:	- 1.712***	-2.329***	-0.528***	-1.052***	-0.255	-1.14***
	(-25.86)	(-35.22)	(-10.14)	(-20.24)	(-2.91)	(-13.00)
Tenure:	**0.036*** **	**0.036*** **	**0.023*** **	**0.023*** **	**0.006**	**0.006**
	(5.52)	**(5.48)**	**(4.67)**	**(4.61)**	**(0.63)**	**(0.61)**
Log Assets:	0.011***	0.011***	0.003**	0.004***	0.001	0.001
	(6.70)	(7.06)	(2.10)	(3.26)	(0.46)	(0.15)
Monthly Flow:	1.61***	1.61***	0.598***	0.594***	0.598***	0.6***
	(43.36)	(43.30)	(19.86)	(19.76)	(12.82)	(12.88)
Turnover:	0.015***	-0.015***	0.006***	0.006***	-0.008**	0.008***
	(-7.41)	(-7.48)	(4.17)	(4.09)	(-2.02)	(-2.11)
Expense Ratio:	4.21***	2.233***	-1.82***	-1.867***	3.355***	-3.282***
	(7.02)	(7.01)	(-3.76)	(-3.87)	(-4.06)	(-3.98)
R-Squared:	0.491	0.289	0.596	0.372	0.885	0.73
Adj. R-Squared:	0.489	0.289	0.595	0.369	0.884	0.727
Observations:	62,166	62,166	44,925	44,925	17,241	17,421

Table 7:	Panel A: All Funds		Panel B: Investment Grade		Panel C: High Yield	
	Risk - Adjusted:	Factor Adjusted:	Raw Returns:	Factor Adjusted:	Raw Returns:	Factor Adjusted:
Intercept:	-0.138	-2.04***	0.972***	-0.885***	2.569***	0.779**
	(-0.57)	(-8.47)	(4.52)	(-4.13)	(8.33)	(2.54)
Tenure:	**-0.06****	**-0.06****	**-0.039**	**-0.042**	**-0.02**	**-0.014**
	(-2.00)	**(-2.00)**	**(-1.47)**	**(-1.62)**	**(-0.53)**	**(-0.38)**
Log Assets:	-0.016**	-0.007***	-0.01*	-0.002	-0.025**	-0.025**
	(-2.27)	(-1.00)	(-1.70)	(-0.34)	(-2.53)	(-2.52)
Monthly Flow:	3.19***	3.188***	1.62***	1.612***	1.376***	1.41***
	(20.96)	(21.02)	(11.23)	(11.21)	(8.21)	(8.46)
Turnover:	0.03***	0.03***	0.015	0.016*	-0.005	-0.008
	(2.78)	(2.82)	(1.55)	(1.68)	(-0.38)	(-0.55)
Expense Ratio:	-14.9***	-15.194***	6.818***	-7.661***	-5.478	-6.65*
	(-5.21)	(-5.32)	(-2.62)	(-2.96)	(-1.52)	(-1.85)
R-Squared:	0.491	0.244	0.523	0.319	0.905	0.606
Adj. R-Squared:	0.489	0.241	0.521	0.315	0.904	0.6
Observations:	6,082	6,082	4,471	4,471	1,611	1,611

Table 8:	Panel A: All Funds		Panel B: Investment Grade		Panel C: High Yield	
	Risk - Adjusted:	Factor Adjusted:	Raw Returns:	Factor Adjusted:	Raw Returns:	Factor Adjusted:
Intercept:	-2.393***	-1.708***	-1.221***	-0.479***	-0.287	-0.049
	(-20.82)	(-15.01)	(-15.41)	(-6.12)	(-1.48)	(-0.25)
Tenure:	**0.037****	**0.038****	**0.015***	**0.014***	**0.029**	**0.025**
	(3.04)	**(3.14)**	**(1.79)**	**(1.71)**	**(1.56)**	**(1.34)**
Log Assets:	0.028***	0.024***	0.006***	0.007***	0.022***	0.019***
	(9.19)	(8.07)	(2.86)	(3.42)	(3.89)	(3.42)
Monthly Flow:	1.46***	1.435***	0.463***	-0.452***	0.475***	0.478***
	(18.89)	(18.77)	(8.63)	(8.52)	(3.93)	(3.99)
Turnover:	-0.028***	-0.028***	-0.004*	-0.004	0.006	0.005
	(-7.09)	(-7.15)	(-1.69)	(-1.47)	(0.74)	(0.66)
Expense Ratio:	9.09***	8.15***	-3.059***	-3.292***	2.959	2.956
	(3.92)	(7.03)	(-3.63)	(-3.96)	(1.58)	(1.60)
R-Squared:	0.481	0.185	0.716	0.23	0.845	0.691
Adj. R-Squared:	0.478	0.181	0.714	0.225	0.842	0.685
Observations:	13,209	13,209	9,742	9,742	3,467	3,467

6.2.1 Full-Time Period 2002-2017

Table 6 shows the results from the panel regressions over the time period from 2002-

2017. The results of Panel 1, which includes the full sample of funds, demonstrate manager

tenure does have a significant positive relationship with both risk-adjusted monthly return and five-factor alpha. It shows that as average manager tenure goes up one year, the expected risk-adjusted monthly return goes up by 3.6 basis points, and this result is significant at the 1% level. The five-factor alpha also goes up by 3.6 basis points and this is significant at the 1% level as well. The investment grade section in Panel B shows similar results, with both raw returns and five-factor alpha increasing by 2.3 basis points for each year of manager tenure. Both results are significant at the 1% level. The adjusted R-squared shows that this regression fits the data well, specifically for risk-adjusted returns, at .489 in Panel A, and .595 in Panel B. The high yield section shows no significant relationship. An interesting trend that is revealed on this table as well as in the later tables is that log assets, monthly flow, turnover, and expense ratios have statistically significant effects on both risk-adjusted monthly return and five-factor adjusted alpha. The results in this table show a positive relationship between log assets, monthly flow, and expense ratio and risk-adjusted returns, and a negative relationship between turnover and risk-adjusted returns. The positive relationship between expenses and performance is interesting.

6.2.2 Crisis Time Period July 2007 – February 2009

The results from Table 9 Panel A show that average manager tenure may not have a statistically significant positive relationship with performance. This panel shows a 6-basis point decrease in performance and five-factor alpha for each year of tenure, and these results are significant at the 5% level. In the investment grade and high yield sections, the results also show a negative relationship, although there is no significance. These results imply that when volatility is higher, and there is a lot of new information entering the market, more experienced managers do not have an advantage, and even that they possibly have a negative advantage. One explanation for this may be that since these managers have more experience, they believe more

22

Table 9:	Panel A: All Funds		Panel B: Investment Grade		Panel C: High Yield	
	Risk - Adjusted:	Factor Adjusted:	Raw Returns:	Factor Adjusted:	Raw Returns:	Factor Adjusted:
Intercept:	-1.501***	-2.226***	-0.462***	-1.032***	-0.084	-1.147***
	(-21.26)	(-31.59)	(-8.54)	(-19.14)	(-0.91)	(-12.32)
Tenure:	**0.051*** **	**0.049*** **	**0.036*** **	**0.034*** **	**-0.001**	**-0.001**
	(3.69)	**(6.44)**	**(6.41)**	**(6.18)**	**(-0.10)**	**(-0.13)**
Log Assets:	0.012***	0.014***	0.005***	0.007***	0	-0.003
	(6.58)	(7.87)	(4.03)	(5.48)	(-0.05)	(-1.16)
Monthly Flow:	1.33***	1.324***	0.438***	0.438***	0.481***	-0.479***
	(31.43)	(31.36)	(13.11)	(13.14)	(9.16)	(9.14)
Turnover:	-0.016***	-0.016***	0.008***	0.007***	0.013***	-0.013***
	(-7.42)	(-7.50)	(5.17)	(5.00)	(-2.80)	(-2.79)
Expense Ratio:	6.06***	5.76***	-0.337	-4.98	4.329***	-4.333***
	(8.87)	(8.44)	(-0.63)	(-0.93)	(-4.62)	(-4.63)
R-Squared:	0.48	0.25	0.571	0.322	0.881	0.681
Adj. R-Squared:	0.478	0.248	0.57	0.32	0.879	0.678
Observations:	42,875	75,875	30,712	30,712	12,163	12,163

strongly in their opinions and are stubborn in their management, possibly causing their returns to suffer. This contrasts to a less experienced manager who may be more conservative during times of high volatility due to them acknowledging that they may not have little experience. Panel A also shows a relatively high Adjusted R-squared at .489 for risk-adjusted returns. The number of observations, however, is much smaller than the full sample due to this time period including less than two years of monthly returns. The other thing to note from the table that is different from the full-time period is that log assets, turnover, and expense ratio all have a negative relationship with performance in this time period.

6.2.3 Pre-Crisis January and Post-Crisis Periods

The pre and post-crisis results are similar to each other and also similar to the full-time period sample. Each of the variables in Panel A of both Table 8, showing pre-crisis results, and

Table 9, showing the post-crisis results are significant. One specific difference is that these two tables show a stronger relationship between average manager tenure and performance than the full-time period. Table 8 shows that as manager tenure goes up by one year, risk-adjusted performance goes up by 3.7 basis points compared to 3.6 basis points in the full-time period. Table 9 shows an even stronger relationship during the post-crisis time period with risk-adjusted performance increasing 5.1 basis points for each year of manager tenure. Both of these results are statistically significant at the 1% level. Panel B of both these tables also shows that the investment grade funds have a statistically significant positive relationship between average manager tenure and performance. The results in Panel C, looking at high yield funds, show no relationship between tenure and performance.

The results of the panel regression echo and support the results of the univariate analysis when it comes to average manager tenure. While there is a negative relationship between performance and tenure during the crisis period, in the full-time period and the pre and post-crisis periods, there is a statically significant positive relationship between average manager tenure and performance, when measured by both returns and five-factor alpha, in the full sample of funds. This relationship is also found clearly in investment grade funds. In high yield funds, however, there is not a clear relationship between average manager tenure and high yield funds. The univariate analysis shows a significant positive relationship in both the full-time period and crisis period, but no relationship in any of the regression analyses. This is with a very high adjusted r-squared in the regressions at over .8 in all cases. Although not directly related, the results from the regressions showing that log assets and expense ratio have a positive relationship with performance in the full-time period is interesting. This is contrary to what may be seen in equity mutual funds and past research, which generally find that as fund size goes up, it is harder

to increase return, and that as expenses go up, returns decrease. What this also implies, is that tenure is positively related to fund assets, monthly flow, and expense ratio, and negatively related to turnover. These results along with the results from the univariate analysis lead to a rejection of the null hypothesis which states that there is not a positive relationship, and an acceptance of H_1 which says that there is a positive relationship.

7. Conclusion

Golic (1996) finds that manager tenure is the most significant predictor of performance and that as manager tenure goes up by 1 year, performance goes up by 5 basis points per year. Other studies (Kaushik, 2010 and Quiang, 2011) find similar results in equity mutual funds. Fortin (1999) however, finds relationships using a very similar analysis as this paper's univariate portfolio analysis. Porter and Trifts (2012 and 2014) also study the topic extensively in equity mutual funds and find mixed results. The results of this paper align with the first group of papers that find a positive relationship. This is also the first paper to look at the relationship between manager tenure and performance specifically in corporate bond mutual funds. The analyses in this paper also use a larger dataset when compared to many of these other studies. This means that the analysis is able to analyze the relationship between tenure and performance over a long period of time which is how long many investors will hold a mutual fund for.

Over the period of 2002-2017 this paper documents a positive relationship between average manager tenure and fund performance when measured both by monthly return and five-factor alpha. The univariate analysis shows a statically significant 2 basis points difference between raw returns of funds with the top third of tenure versus funds with the bottom third of tenure. The results in specific time periods are similar, however negative in the shortened time period of the financial crisis. Still, an extra 2 basis point monthly return can add up over time,

and recessions do not last for a relatively long period of time. This relationship is seen stronger in investment grade funds. The regression analysis shows similar results. Over the full-time period, as average manager tenure goes up by 1 year, the expected risk-adjusted return goes up by 3.6 basis points. These results once again show a negative relationship during the crisis, but a stronger relationship in the pre and post-crisis time periods, these results are significant in all the time periods. This relationship sticks in investment grade funds, while it is not found to be statistically significant in high yield funds.

This study sheds light on the fact that if investors are looking to buy a bond mutual fund and hold it for a long period of time, they should consider average manager tenure. While the difference may be small, over time the difference in performance that average manager tenure is associated with can add up over time, and potentially allow a person saving for retirement to be better off.

References

Bliss, R. T., Potter, M. E., & Schwarz, C. (2008). Performance characteristics of individually-managed versus team-managed mutual funds. *Journal of Portfolio Management, 34*, 110-119.

Brown, S. J., Goetzmann, W. N., & Park, J. (2001). Careers and survival: Competition and risk in the hedge fund and CTA industry. *Journal of Finance, 56*, 1869-1886.

Chevalier, J., & Ellison, G. (1999). Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *Journal of Finance, 54*(3), 875-899.

Cici, G., & Gibson, S. (2012). The performance of corporate bond mutual funds: Evidence based on security-level holdings. *Journal of Financial & Quantitative Analysis*, 47.

Du, D., Huang, Z., & Blanchfield, P. J. (2009). Do fixed income mutual fund managers have managerial skills?. *Quarterly Review of Economics & Finance*, 49, 378-397

Fama, E. F., & French, K. R. (1993), Common risk factors in the returns on stocks and bonds., *Journal of Financial Economics, 33*, 3-56.

Fortin, R., & Michelson, S. (1999). Does mutual fund manager tenure matter? *Journal Of Financial Planning, 12*, 72-79.

French, K. R. (2008). Presidential address: The cost of active investing. *Journal of Finance, 63,* 1537-1573.

Golec, J. H. (1996). The effects of mutual fund managers' characteristics on their portfolio performance, risk and fees. *Financial Services Review*, 5, 133.

Investment Company Factbook (2018). A review of trends and activities in the investment company industry. *Investment Company Factbook,* 58, Investment Company.

Kaushik, A. (2010). Managerial tenure and other determinants of mutual fund performance: correlations and implications. *Proceedings of the northeast business & economics association*, 303-307.

Kempf, A., Ruenzi, S., & Thiele, T. (2009). Employment risk, compensation incentives, and managerial risk taking: evidence from the mutual fund industry. *Journal of Financial Economics, 92*, 92-108.

Kjetsaa, R., & Kieff, M. (2016). Impact of expenses, turnover and manager tenure on blend fund performance. *Journal of Business & Accounting, 9,* 99-115.

Kosowski, R., Timmermann, A., Wermers, R., & White, H. (2006). Can mutual fund "stars" really pick stocks? New evidence from a bootstrap analysis. *Journal of Finance, 61*, 2551-2595.

Moneta, F. (2015). Measuring bond mutual fund performance with portfolio characteristics. *Journal of Empirical Finance, 33*, 223-242.

Payne, T. H., Prather, L., & Bertin, W. (1999). Value creation and determinants of equity fund performance. *Journal of Business Research, 45*, 69-74.

Porter, G. E., & Trifts, J. W. (1998). Performance persistence of experienced mutual fund managers. *Financial Services Review, 7,* 57.

Porter, G. E., & Trifts, J. W. (2012). The best mutual fund managers: Testing the impact of experience esing a survivorship bias free dataset. *Journal of Applied Finance, 22*, 105-117.

Porter, G. E., & Trifts, J. W. (2014). The career paths of mutual fund managers: The role of merit. *Financial Analysts Journal, 70*, 55-71

Redman, A. L., & Gullett, N. S. (2007). Impact of fund, management and market characteristics on bond mutual fund performance. *Journal of Asset Management, 7,* 429-442.

Qiang, B. (2011). Exposing management characteristics in mutual fund performance. *Proceedings of The Northeast Business & Economics Association*, 54-58.

Yuhong, F., & Addams, H. L. (2012). United States-based international mutual funds: Performance and persistence. *Financial Services Review, 21*, 51-61

Yuhong, F., & Mazumder, M. I. (2017). CFA, MBA or both: further evidence on mutual fund performance. *Journal of Accounting & Finance (2158-3625), 17*, 140-158.