The Portfolio Characteristics and Investment Performance of Bank Loan Mutual Funds

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Abstract

This study investigates the investment performance of bank loan mutual funds from April 1993 to March 2013. The findings: bank loan mutual funds, as a group, are more strongly correlated with high yield corporate bonds than with the other segments of the bond market or stock market. From 1993 to 2013, bank loan funds achieved a negative but statistically insignificant performance, which suggests that the funds, as a group, simply tracked their benchmark index.

1. Introduction

Bank loan funds, also known as loan participation funds, senior loan funds, floating rate funds, or prime rate funds, are mutual funds that mainly invest in secured, intermediate-term loans that banks have granted to companies that have less than an investment-grade rating. These loans typically have maturities from 5 to 8 years and are secured by specific assets of the borrower. The loans are generally speculative (rated below Standard and Poor's BBB rating) and the funds that purchase these loans from the banks therefore carry significant credit risks, but earn attractive credit risk premiums. The loans are typically floating rate loans, that is, the coupon rate on the loans is adjusted periodically based on some market rate, such as the bank's prime rate, the London Interbank Offered Rate (LIBOR), or some other market rate. As with all adjustable rate loans, the market price of the loans tends to be quite stable and thus interest rate risk is substantially curtailed. Those that invest in bank loan mutual funds are faced with the tradeoff between the fund's credit risk and interest rate risk. The funds also have significant prepayment risk and liquidity risk, because fund sponsors typically redeem shares infrequently. Many in the mutual fund industry have asserted that bank loan mutual funds offer stable and attractive yields to compensate for these risks.

Bank loan mutual funds are comparable to high-yield (junk) bond funds that are typically risky but also offer high yields to compensate for their credit risk. According to Knight (2006), investors use bank loan funds as substitutes for money market investments, although they should be compared with high yield bond funds. Similarly, Opdyke (2005) asserted that investors use bank loan funds as stand-in for money market mutual funds.

Many newspapers have reported on bank loan mutual funds, but I am aware of only two academic studies that investigated the investment performance of bank loan mutual funds. Chan and Trainor (2007) investigated five of the oldest bank loan funds, from 1990 to 2005, and observed that these funds had lower default rates than high yield bond funds and that, in the event of default, they had higher recovery rates.[i] They also found that bank loan mutual funds provided consistent returns commensurate with their risk, and that they had the best risk-return tradeoff than any other asset class, in spite of their high expense ratios and sales loads, on average. Chan, Chan, and Trainor (2008) compared 25 funds from 2002 to 2006, using the funds' Jensen's Alphas and found that the funds showed performance persistence during the study period. They recommended that, to boost returns and enhance portfolio diversification, investors should hold bank loan funds in their portfolios.

Newspaper reports generally assert that bank loan mutual funds are not significantly correlated with other investments. According to Kovaleski (2000), bank loan funds were not strongly correlated with most types of fixed income investments, including U.S. Treasuries, investment grade bonds, money market securities, and international bonds. And Noyes Capital Management, LLC (2005) asserted that bank loan mutual funds more closely correlated with junk bonds but that they carried less credit risk than junk bonds issued by comparable companies. Furthermore, Morningstar Inc. noted that bank loan mutual funds lost approximately 30% of their values in 2008, worse than fixed income funds, on average.

The purpose of this study is to investigate the portfolio characteristics and risk-adjusted investment performance of bank loan mutual funds over a sufficiently long time period using a larger sample size than was possible before, since this segment of the mutual fund industry was relatively new at the turn of the century. I am particularly interested in examining the extent to which these funds correlated with other investment classes, as well as the consistency of their performance over time.

2. The Data

The sample selection criteria excluded mutual funds with inception dates after March 1, 2003 as well as those with total assets less than $500 million. The sample period is April 1993 to March 2013 and consists of 87 bank loan mutual funds. Monthly fund returns and corresponding one-month-Treasury-bill yields were obtained from the Morningstar Principia database. Five bond indices were used in this study including Barclays USD Aggregate Bond Index (Barc1), Barclays Intermediate Aggregate Bond Index (Barc2), Barclays 5-10 Year Government/Credit (Barc3), Barclays High Yield Corporate Bond Index (Barc4), and Barclays Government/Credit 1-5 Year Index (Barc5), in an attempt to determine the most appropriate benchmark for bank loan mutual funds. Monthly rates of return on these bond indices and on the S&P 500 index were obtained from the Morningstar Principia database. Net asset values, market capitalization and other data were also obtained from the same database.

Table 1 shows that the net assets and market capitalization of an average bank loan fund are $784 million and $16.245 billion, respectably, with substantial variability among funds as indicated by the associated standard deviations. The average bank loan fund held 449 securities, held 87% of its portfolio in bonds, and no more than 1.2% of its portfolio in stocks. Furthermore, the average portfolio turnover was 62% and the mutual fund's top 10 holdings were 19% of the fund's portfolio. Finally, the average fund had an expense ratio of 1.3% with a front load that ranged from 0 to 4.75%, and a deferred load that ranged from 0 to 5%.

3. The Methodology:

In this study, the risk-adjusted investment performance of bank loan mutual funds was measured in two ways: (1) by using the Jensen's Alpha, which assumedthat the mutual fund portfolio was fully diversified and thus used portfolio beta as the appropriate measure of portfolio risk; (2) by using the Sharpe Information Ratio which used the standard deviation of portfolio returns as the measure of portfolio risk. The Jensen's Alpha is calculated using the following regression equation:

$$r_{pt} = \alpha_p + \hat{\beta}_p\, r_{bt} + e_{pt}, \qquad\qquad [1]$$

where, r_{pt} is the excess return on mutual-fund portfolio p, in month t (i.e. the portfolio's monthly return in excess of the corresponding monthly yield on 91-day-Treasury bills); r_{bt} is the monthly excess return on one of the five Barclays bond indices (as defined in the "data" section) in month t; and e_{pt} is the residual return on portfolio p, in month t. Portfolio p's risk-adjusted investment performance is measured by the Alpha, α_p. The risk-adjusted performance was again measured using the Sharpe Information Ratio as suggested by Reilly and Norton (2006) and Goodwin (1998). If "D_t" is the differential return between the portfolio and the benchmark $(r_{pt} - r_{bt})$ in month t, then:

$$S_p = \frac{\bar{D}}{\sigma_D}, \qquad\qquad [2]$$

where, $\bar{D}$ is the arithmetic average of the monthly differential returns, i.e. $\bar{D} = \frac{1}{n}\sum_{t=1}^{n} D_t$; σ_D is the standard deviation of the differential returns; and n is the number of monthly returns. For the test of null hypothesis--that the differential returns are zero, on average--the t-statistic is:

$$t = \frac{\bar{D}}{\sigma_D \sqrt{n}}. \qquad\qquad [3]$$

The t-statistic has a t distribution with n-1 degrees of freedom.

As with the Jensen's Alpha, the Sharpe Information Ratio indicates portfolio performance relative to the fund's benchmark index and lends itself to statistical testing of significance. However, unlike the Alpha, the Sharpe Information Ratio adjusts for total risk, rather than just systematic risk. This is crucial for performance measurement because previous studies have shown that mutual fund portfolios, on average, contain significant idiosyncratic risks. Reilly and Norton (2006) and Goodwin (1998) argued that the Sharpe Information Ratio was a more general measure of portfolio performance than the traditional Sharpe measure.

Tracking error of the fund's portfolio was calculated as follows:

$$\text{Tracking Error} = \sigma_D \sqrt{12}, \qquad\qquad [4]$$

where "12" signifies that the number of return periods in a year is 12 (for monthly returns).[ii]

4. The Results

Table 2 shows mean monthly excess returns for bank loan mutual funds (as a group), the S&P 500 index, and 5 bond indices, from April 1993 to March 2013. Correlation coefficients among the indicesand the funds are also shown. Bank loan mutual funds underperformed all of the market segments represented by the indices, when investment performance was measured by the coefficient of variation. As a group, the funds were more strongly correlated with the Barclays High Yield Corporate Bond Index (Barc4), as indicated by the correlation coefficient of 0.77. Noyes (2005) had asserted that bank loan mutual funds more closely correlated with junk bonds. The results of this study also agree with Kovaleski (2000), who asserted that bank loan mutual funds were not strongly correlated with most types of fixed income investments, and Knight (2006), who asserted that bank loan mutual funds should be compared with high yield bonds and not with money market funds. It is remarkable that bank loan funds underperformed Barc5, the index that they tracked. The correlation with Barc5 was -0.08, which was about the same correlation between Barc5 and the London Interbank Offered Rate (LIBOR).

During recessionary periods and during periods of rising market rates, the funds had negative correlations with Barc5, -0.12 and -0.04, respectively. Table 2 shows that Barc5 was substantially more correlated with the other bond indices than with the funds.

Table 3 shows measures of investment performance, represented by the Sharpe Information Ratio, S_p. The calculated information ratios were not significantly different from zero irrespective of which bond index used to measure performance. The only time the performance measure was positive (+0.45) was during rising market rates, suggesting that when market interest rates were rising, bank loan mutual funds, as a group, were not negatively impacted significantly. Tracking error (TRE) for the funds, calculated using Barc5 as the benchmark for the funds, ranged from 1.94 (during periods of rising rates) to 13.07 (during recessionary periods).

Table 4 shows that when investment performance was measured again using Jensen's Alpha, the funds were positively correlated with Barclays High Yield Corporate bond index (Barc4), negatively correlated with the index they were tracking (Barc5), and not significantly correlated with the other bond indices, as indicated by the estimated slopes of the regression model. Noyes (2005) and Knight (2006) have suggested that bank loan funds appeared to track high yield bond index (Barc4 in this study); however, the estimated Alphaswere positive and significant, except for the Alpha estimated using Barc4, which was negative and statistically significant.During the 20-year sample period, bank loan funds outperformed the index they were tracking (Barc5) as judged by the Alpha, which was positive and statistically significant. Chan, Chan, and Trainor (2008) used a different corporate bond index and observed that bank loan funds boosted returns and diversification from 2002 to 2006.

In summary, when the Sharpe Information Ratio was used as the measure of investment performance, bank loan mutual funds neither underperformed nor outperformed any of the five bond indices used as alternative benchmarks in this study. When the Jensen's Alpha was used to measure performance, instead, the funds as a group outperformed four of the five indices and underperformed the Barclays High Yield Corporate Bond index (Barc4). Since mutual fund portfolios are known to contain significant amounts of idiosyncratic risks, the Sharpe Information Ratio was considered a more appropriate measure of performance. I therefore conclude that bank loan funds had tracked their benchmark index from 1993 to 2013.

5. Summary and Conclusions

This study investigates the investment performance of bank loan mutual funds from April 1993 to m March 2013, using two alternative measures of risk adjusted investment performance. The findings: bank loan mutual funds as a group more strongly correlated with high yield corporate bondsthan with the other segments of the bond market or stock market. Using a measure of performance that assumed that mutual fund portfolios were fully diversified, bank loan funds outperformed four different bond indices and underperformed a high yield corporate bond index. Furthermore, during periods of rising market interest rates, bank loan funds outperformed their benchmark index, but neither outperformednor underperformed their benchmark index during recessionary periods. Using a measure of performance that did not assume that fund portfolios were fully diversified, bank loan funds simply achieved a negative but statistically insignificant performance, which suggests that the funds, as a group, tracked their benchmark index. Since mutual fund portfolios are known to contain significant amounts of idiosyncratic risks, this study concludes that bank loan funds simply tracked their indices from 1993 to 2013.

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Table 1

Portfolio Characteristics of Bank Loan Mutual Funds

(April 1993 – March 2013)

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Net Assets ($mm)	71	784.32	1,458.88	0	7,450.10
MKT. Cap. ($mm)	26	16,245.69	12,648.14	321.00	28.569.00
DStocks (%)	87	0.59	1.33	0	5.62
FStocks (%)	87	0.57	1.53	0	6.47
Bonds (%)	87	86.58	6.40	73.18	99.13
Cash (%)	87	7.98	4.76	0.87	14.93
Holdings	87	449.38	214.80	163.00	1074.00
TopTen (%)	87	18.53	8.54	9.43	57.07
Turnover (%)	87	61.55	23.12	15.00	100.00
P/B	21	2.60	0.42	1.56	2.85
Expense Ratio	87	1.26	0.44	0.62	2.40
Front load	87	0.55	1.16	0	4.75
Deferred Load	87	0.70	1.35	0	5.00

Note:

DStocks and FStocks are the percentage of the fund's portfolio represented by domestic stocks and foreign stocks, respectively; TopTen is the percentage of the fund's portfolio represented by its top 10 holdings.

Table 2

Correlation Coefficients between Bank Loan Mutual Funds and Market Indices

(April 1993 – March 2013)

Variable	Excess Return		Pearson Correlation Coefficient							
	Mean	Std. Dev.	BLFs	SP500	Barc1	Barc2	Barc3	Barc4	Barc5	LIBOR
A. Full Sample:										
BLFs	0.21	2.25	1.00	0.51	-0.00	0.01	0.00	0.77	-0.08	-0.23
SP500	0.55	4.36		1.00	0.04	0.04	0.04	0.62	-0.04	-0.02
Barc1	0.27	1.05			1.00	0.99	0.98	0.22	0.92	-0.09
Barc2	0.24	0.83				1.00	0.97	0.23	0.96	-0.10
Barc3	0.33	1.51					1.00	0.23	0.93	-0.11
Barc4	0.45	2.61						1.00	0.14	-0.21
Barc5	0.18	0.62							1.00	-0.07
LIBOR	---	---								1.00
Recessionary Periods:										
Barc5	0.38	0.69	-0.12	-0.13	0.89	0.93	0.90	0.04	1.00	-0.05
Periods of Rising Market Rates:										
Barc5	-0.01	0.62	-0.04	0.35	0.96	0.97	0.96	0.58	1.00	0.25

Note:

BLFs represents Bank Loan Mutual Funds; SP00 refers to the Standard and Poor's 500 index; Barc1 refers to Barclays Aggregate Bond index; Barc2 refers to Barclays Intermediate Aggregate Bond index; Barc3 refers to Barclays 5-10 Year Government/Credit index; Barc4 refers to Barclays High Yield Corporate Bond index; and Barc5 refers to Barclays Government/Credit 1-5 Year index. LIBOR refers to London Interbank Offered Rate. Recessionary Periods represents January 2000 to December 2002, and June 2007 to December 2009. Periods of Rising Market Rates represents 4-01-93 to 6-01-1995 and 11-01-2004 to 5-01-2007.

Table 3

Investment performance of Bank Loan Mutual Funds: The Share Information Ratio

(April 1993 – March 2013)

Variable	Mean	Std. Deviation	Minimum	Maximum
Performance Relative to Barc1:				
$\bar{D}$	-0.10	0.06	-0.23	0.10
S_p	-0.04	0.03	-0.10	0.04
t-stat	-0.00	---	---	---
Tracking Error	8.59	1.24	6.24	10.82
Performance Relative to Barc2:				
$\bar{D}$	-0.07	0.06	-0.20	0.13
S_p	-0.03	0.03	-0.09	0.05
t-stat	-0.00	---	---	---
Tracking Error	8.28	1.28	5.86	10.52
Performance Relative to Barc3:				
$\bar{D}$	-0.19	0.06	-0.33	0.02
S_p	-0.07	0.03	-0.13	0.01
t-stat	-0.01	---	---	---
Tracking Error	9.50	1.13	7.40	11.68
Performance Relative to Barc4:				
$\bar{D}$	-0.36	0.09	-0.50	-0.08
S_p	-0.19	0.05	-0.29	-0.09
t-stat	-0.01	---	---	---
Tracking Error	6.62	1.09	2.73	8.12
Performance Relative to Barc5: Full Sample Period				
$\bar{D}$	0.01	0.06	-0.12	0.20

S_p	0.00	0.02	-0.04	0.07
t-stat	0.00	---	---	---
Tracking Error	8.28	1.33	5.75	10.49
Performance Relative to Barc5: Recessionary Periods				
$\bar{D}$	-0.51	0.19	-1.10	-0.30
S_p	-0.14	0.05	-0.29	-0.08
t-stat	-0.01	---	---	---
Tracking Error	13.07	2.41	8.35	16.62
Performance Relative to Barc5: Periods of Rising Interest Rates				
$\bar{D}$	0.25	0.09	0.13	0.55
S_p	0.45	0.13	0.23	0.89
t-stat	0.03	---	---	---
Tracking Error	1.94	0.49	1.47	3.74

Note:

The variables shown in this table were measured using equation (2 and equation (3)), as

follows: $S_p = \dfrac{\bar{D}}{\sigma_D}$; $t = \dfrac{\bar{D}}{\sigma_D \sqrt{n}}$.

*t-stat is significant at the 5% level.

Table 4

Investment performance of Bank Loan Mutual Funds: Jensen's Alpha

(April 1993 – March 2013)

Bond Index	Alpha, α_p	Slope
Barc1:	0.22	-0.00
T-statistic	10.18*	-0.20
Barc2:	0.20	0.04
T-statistic	9.50*	1.52
Barc3:	0.21	0.00
T-statistic	10.21*	0.12

Barc4:	-0.10	0.57
T-statistic	-7.87*	134.99*
Barc5: Full Sample	0.28	-0.31
T-statistic	13.06*	-9.30*
Barc5: Recession	0.08	-0.58
T-statistic	1.39	-7.74*
Barc5: Rising Rates	0.17	-0.03
T-statistic	26.17*	-1.87

Note:

BLFs represents Bank Loan Mutual Funds; SP00 refers to the Standard and Poor's 500 index; Barc1 refers to Barclays Aggregate Bond index; Barc2 refers to Barclays Intermediate Aggregate Bond index; Barc3 refers to Barclays 5-10 Year Government/Credit index; Barc4 refers to Barclays High Yield Corporate Bond index; and Barc5 refers to Barclays Government/Credit 1-5 Year index. LIBOR refers to London Interbank Offered Rate. Recessionary Periods represents January 2000 to December 2002, and June 2007 to December 2009. Periods of Rising Market Rates represents 4-01-93 to 6-01-1995 and 11-01-2004 to 5-01-2007.

Jensen's Alphas were measured using equation (1), as defined in the "methodology" section:

$$r_{pt} = \alpha_p + \hat{\beta}_p \, r_{bt} + e_{pt}$$

*t-statistic is significant at the 5% level.

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[i]The oldest bank loan mutual fund, the Franklin Floating Rate Trust Fund was launched in 1997.

[ii]See Reilly and Brown (2009) for the measurement of tracking error.