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Investment Newsletter – March 2017

This newsletter has frequently discussed Closed-End Funds when reporting on the returns from our fixed income strategies. This quarter we take a deeper dive into the subject to show how to analyze these funds and use them to our advantage. After that, we'll illustrate the benefits of using these funds by providing an update on the performance of the Short Term Income strategy.

Benefits and Risks of Closed End Funds for Fixed Income Investing

A Closed-End Fund (CEF) is an investment fund that trades on an exchange like stocks. This article will explain how these funds work and how they are different from other types of funds. We will look at the key structural features that impact risks and returns and show how to analyze the benefits of a CEF compared to owning the underlying portfolio. We will focus on fixed income CEFs and, as an example, analyze a particular CEF from our portfolio.

The term Closed-End refers to the fact that the fund is closed to redemptions of its shares (as opposed to an open-end fund which must pay out a share of underlying portfolio value to shareholders when they ask to redeem their shares). A CEF has a fixed number of shares which are sold via an initial public offering; these shares remain outstanding indefinitely or until the shareholders vote to liquidate the fund. Let's compare this to two other well known types of funds.

Exchange Traded Funds (ETFs) also trade on the securities exchange like the CEFs. Therefore, both CEFs and ETFs can trade at prices that diverge from the underlying **Net Asset Value (NAV)** of their portfolio. Unlike a CEF, however, an ETF may be redeemed for a pro-rata share (an "in-kind" redemption) of the underlying portfolio – provided you set up this capability with the sponsor of the ETF and your redemption request meets the minimum amount set by the sponsor. Note that the ETF does not pay out cash, but instead distributes the underlying securities that were in the portfolio. Traders can also create new ETF shares by trading an in-kind portfolio of securities (matching the underlying portfolio weightings) for new ETF shares. ETF redemption and creation transactions are carried out by institutional trading companies with the scale and sophistication to quickly trade in and out to profit from divergences of the ETF price from the price of the underlying portfolio. Such trading will generally, but not always, keep ETF prices quite close to the value of the underlying portfolio – the NAV. There is no similar mechanism for CEFs and therefore CEF prices can move far away from NAV

Berkeley Investment Advisors
Investment Newsletter – March 2017

depending on supply and demand for these securities at a given time. Another difference is that ETFs are almost always passive indexed portfolios whereas CEF portfolios are actively managed.

Mutual funds (also referred to as Open-End funds) do not trade on securities exchanges. Instead mutual fund shareholders may redeem shares only at the end of the trading day for cash¹ equal to the underlying portfolio net asset value. If such redemptions are significant, the portfolio manager will be forced to sell portfolio securities the next day. This, in turn, may drive down the value of portfolio holdings if such sales are large enough to push down individual securities' prices. This could lead to a downward spiral: if the fund has to sell securities which require discounting and the resulting fund share price declines motivate more fund owners to bail out. Because of this dynamic, CEFs are more appropriate than mutual funds for investing in less liquid securities.

The discussion above highlighted some factors which differentiate CEFs. Let us now focus on those structural factors that have the most important implications for evaluating these securities. One of the key advantages of CEFs is that a CEF can trade at a large discount (or premium) to its underlying net asset value. This means we may get to buy \$100 worth of bonds for \$90 and earn interest on the full \$100. Also, since the price can then move back to or above the underlying bond value, we may have an opportunity to earn additional income by selling when large discounts revert to smaller discounts (or move to premiums) and replacing them with other CEFs that have fallen to larger discounts. Effectively this type of trading supplies liquidity to the market and we earn some income for trading with others who are more desperate to buy or sell particular securities.

Fund leverage is another structural feature of CEFs that can increase returns. Fixed income CEFs typically fund assets with borrowing in the range of 20-40% of total assets. Such borrowing is priced at much lower interest rates than rates earned on the CEF portfolio because these borrowings are based on short term interest rates and the loan is very low risk for the lender (because it is backed by a large and liquid asset base). Therefore the CEF benefits by earning an additional spread on the borrowing which it can pass on to the CEF owners. This increases the earning power and dividends of the CEF – especially in low interest rate environments such as we've been in since 2008. Recent projections from the Federal Reserve indicate that, while rates will rise somewhat, they will remain very low by historic standards for the foreseeable future.

Relative to owning bonds directly or passive ETF portfolios, CEFs do have one structural disadvantage. Because CEFs are actively managed portfolios, they incur higher management and operating expenses than passively indexed ETFs. As with any active portfolio, expenses offset returns and therefore we need to evaluate these expenses in relation to the investment income produced by the fund.

Regardless of the form of our investment (CEF, ETF, mutual fund or direct holdings), bond and loan portfolios are subject to interest rate, default, and credit spread risks. The sensitivity of a bond portfolio to interest rates is measured by effective duration. This measure says what percentage the value would change for

¹ Although mutual funds are allowed to do in-kind redemptions, this would only happen in very unusual circumstances.

Berkeley Investment Advisors
Investment Newsletter – March 2017

a given percentage change in interest rates – taking into account portfolio leverage and any hedges in place. Defaults tend to reduce the overall returns of well diversified portfolios but generally are a relatively minor factor in price volatility. In contrast, changes in the economic environment and market attitudes towards risk can manifest themselves in significant changes in credit spreads that result in large moves in portfolio value. Effectively credit risk pricing moves in tandem with equity markets – though movements are less extreme. These risk factors are important to evaluating whether a given CEF offers sufficient return to justify its risks.

A contributing factor to CEF risks is the leverage employed. As mentioned earlier we can earn higher interest using CEFs because they earn a spread over their borrowed money. But the flip side of this benefit is that movements in the value of the underlying bonds and loans will be magnified by the use of leverage. As an example, suppose a CEF contains \$100 of bonds with 30% financed by borrowing so that net asset value is \$70. If the bonds move 7%, the value of the bonds drops to \$93 and the net asset value drops to \$63 – which is a 10% drop. Likewise a drop in the interest earned by the bonds will be magnified to a larger drop in the yield on the CEF. Thus the leverage tends to increase the volatility of CEF returns.

We evaluate the potential returns of a CEF by looking at the investment income generated by the underlying portfolio. For bond and loan funds we are most interested in interest earnings. We give less consideration to reported capital gains since there is little reason to expect past gains to predict future gains. Interest earnings are far more predictive of future performance for a bond portfolio. We want to see that such earnings as a percentage of assets are sufficient to justify the risks in the portfolio. Because CEFs don't have to be concerned with selling securities on short notice to pay redemptions, they should hold some portion of the portfolio in less liquid bonds that can produce higher yields. Note that the amounts paid out by the CEF to its shareholders may differ significantly from its investment earnings.

This brings us to the topic of distributions policy. The monthly dividend to shareholders of a CEF may or may not be in line with the CEF portfolio earnings. Some funds deliberately pay out much more than their earnings; these funds will drive their NAV lower and are likely to eventually cut their dividends. In other cases payouts may be below actual earnings. In any case, it is important to judge the CEFs future returns by its underlying investment earnings not by its dividend policy.

Individual CEFs' total market values are often small relative to the value of outstanding securities for other types of investment. In particular ETFs and stocks have much higher average capitalizations. This also translates into trading volume: because outstanding value is less, trading volume is lower. Most of these funds have market capitalizations below \$900 million – so this is equivalent to small capitalization stocks. Because there are fewer securities to buy and sell, and fewer transactions each day, larger investors generally leave trading in these instruments to individuals and smaller investment advisors. The result is much greater price volatility than for ETFs with similar portfolios. This leads to wide variation in discounts or premiums relative to NAV. Therefore, when evaluating a CEF we look at how large our position can be relative to trading volume. We should also consider

Berkeley Investment Advisors
Investment Newsletter – March 2017

the current price discount in relation to historic fluctuations in the discount when deciding when to buy or when to sell a particular CEF.

Now that you know all about CEFs, let's use some math to analyze just how much extra return we can get from buying these securities compared to buying the underlying bond portfolio directly. I will call this the Yield Effect. We probably could not actually buy the underlying bond portfolio because bonds are very illiquid (usually corporate bonds issued more than 2 years previously are particularly hard to buy). Still, the mathematical analysis of yield is a useful metric to see what we are getting with a particular CEF. Our objective is to come up with a formula for the Yield Effect of owning the CEF as compared to owning the bond portfolio directly. The Yield Effect (YE) of holding the bond portfolio in the CEF is:

$$(1) \quad YE = \text{CEF Yield} - PY.$$

We define terminology as follows:

PY = Portfolio Yield: interest income on the underlying portfolio of bonds as a percentage of value

CEF Yield = $NII/Price$

NII = Net Investment Income per share

Price = market price per share of the CEF

NAV = Net Asset Value per share

Discount = $100\% - (Price/NAV)$ is the percentage by which Price is below NAV

Leverage = the fund's borrowings as a percentage of gross fund assets

Interest Expense Ratio = interest cost of borrowings as a percentage of NAV

Expense Ratio = Expenses of the fund (other than interest) as a percentage of NAV

Although the portfolio yield (PY), is not directly observable, we can calculate it from other variables as follows:

$$PY = (1 - Leverage) * [CEF Yield * (1 - Discount) + Expense Ratio + Interest Expense Ratio]$$

Substituting this into equation (1) above gives us a practical formula for YE.

As an example, Nuveen Credit Strategy Income fund (ticker symbol JQC) has the following variable values as of March 24:

NII = .576

NAV = 9.34

Price = 8.75

Leverage = 35.39%

Expense Ratio = 1.35%

Interest Expense Ratio = .81%

Calculations are as follows:

Discount = $1 - (8.75/9.34) = 6.3\%$

CEF Yield = $.576/8.75 = 6.58\%$

PY = $(1 - .3539) * [6.58\% * (1 - 6.3\%) + 1.35\% + .81\%] = 5.38\%$

YE = $6.58\% - 5.38\% = 1.20\%$

The Nuveen Credit Strategy Income fund had a leverage adjusted effective duration of 1.08 as of 2/28/2017. All else equal, if the treasury yield curve rises 1% then the NAV of this fund would drop 1.08%. Roughly 90% of the portfolio is below

investment grade; 73% is invested in variable rate senior loans. In the current economic environment, this fund is unlikely to see a large increase in default costs. It will be somewhat sensitive to credit spreads. Probably the biggest risk to the CEF price is the market price discount to NAV. The discount hit 15.2% in January 2016 and it has averaged 8% over the last 5 years – so it can move a lot when there is a sudden surge of sellers. Average daily trading volume is only about \$4.5 million, which is why it is easy for the discount to move significantly when any imbalance arises between buyers and sellers.

Despite the price volatility, the returns on this fund are very good considering that the risks to NAV and the dividend stream are relatively low. For long term investors who have no need to sell, most of the return will end up coming from the underlying interest. Therefore the price volatility presents more opportunity than risk. The next section, which reviews our returns on the Short Term Income strategy, will show how this plays out in our favor over the long run.

Short Term Income Portfolio Strategy and Performance

Berkeley Investment Advisors uses several different strategy portfolios to manage client assets. The Short Term Income portfolio is a fixed income portfolio that focuses on short to intermediate term rate maturity loans and bonds. Typically shorter maturity bonds offer lower interest rates (yields) than longer maturity bonds and are less sensitive to changes in interest rates. This category of fixed income includes securities with floating interest rates that can reset periodically depending on market conditions. For example the rate paid could be set based on the 3-month London Interbank Offer Rate (3-month LIBOR). This rate, in turn, changes as the Federal Reserve Bank raises (or lowers) its "Fed Funds Rate".

The interest rate risk sensitivity risk of the portfolio is measured by its duration. Typically a short term bond fund strategy would own bonds with durations below 3. If we held a bond with duration of 3 when rates went up 1%, we would expect the bond's price to decline by 3%. In the current environment where interest rates are historically low and on the way up, we have chosen to keep portfolio duration to an even lower level – currently 1.5.

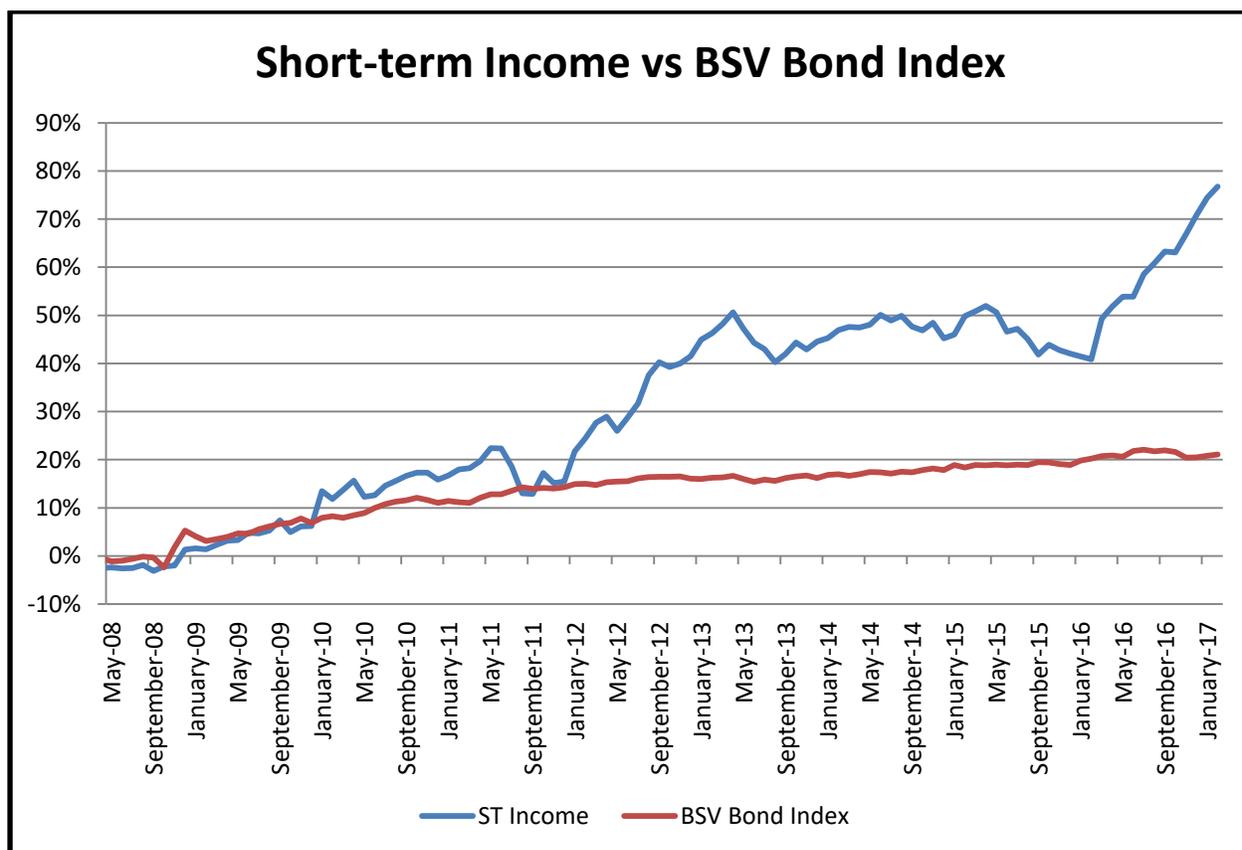
There is also credit risk in our portfolio –borrowers may default and not pay all that is due. High yield bonds have a higher probability of default than investment grade rated bonds but these lower rated bonds compensate by paying higher interest rates. It is this spread compensation that fluctuates depending on the market's current risk pricing attitude (mood). As mentioned above, this pricing risk is related to equity market risk and it is also correlated with the performance of the economy. We manage individual credit risk by diversifying across a large number of issuers. This ensures that the extra premiums earned will not get wiped out by a few companies defaulting. Our strategy is to accept credit risks to earn the extra returns associated with those risks.

The portfolio also earns incremental yield by holding closed-end funds, as explained in the previous section. In holding these securities we must endure more price volatility in down markets as retail investors tend to want to sell more at lows. Current market conditions are providing about 1% higher yield on our portfolio than if we held the underlying bonds directly.

Berkeley Investment Advisors
Investment Newsletter – March 2017

The portfolio is diversified across virtually all sectors of the fixed income market, except treasury bonds (though it does contain government mortgage agency securities). The best comparison index is the "Barclays U.S. 1-5 year Government/Credit Float Adjusted Bond Index" as represented by the Vanguard Short-Term Bond exchange traded fund (ticker BSV). This is meant to represent the total short maturity U.S. bond market. It is not a perfect comparison to our strategy since this index includes U.S. treasury bonds but there is nothing closer that has been in existence for the life of our portfolio.

At least some clients have had money invested in this portfolio since it was created in February 2008. The graph below and the table on the next page show total returns including price and interest payments in comparison to the bond index mentioned above as implemented in the exchange traded fund (ticker BSV). Our portfolio returns calculated here are based on a particular client's account and have been reduced by annual fees of 1.25% which would apply to new accounts above \$500,000 but below \$1 million.



The cumulative return for the strategy from 2/29/2008 to 2/28/2017 is 76.8%. **Thus the annualized compounded rate of return since inception (9 years ago) has been 6.53%.** This result is actually a bit higher than I would expect for this portfolio over the long run.

The graph shows moderate volatility for the strategy's returns. Although this strategy did incur a minor loss in its 8th year, generally there is much lower risk of

Berkeley Investment Advisors
Investment Newsletter – March 2017

principal loss over a year's time than in other strategies - such as stocks or long term bonds. Relatively large allocations to this strategy should serve to reduce risk for clients when other asset classes have elevated risks. The stock market continues to look particularly risky using historical norms. We want to avoid large losses and have funds available to buy when the market returns to a lower level. The table below breaks down the portfolio returns by year since inception.

		Returns by Year		
		Short term Income	BSV Bond Index	Difference
Year				
1	3/2008 - 2/2009	1.4%	3.1%	-1.7%
2	3/2009 - 2/2010	10.3%	5.0%	5.4%
3	3/2010 - 2/2011	5.5%	2.7%	2.8%
4	3/2011 - 2/2012	5.5%	3.4%	2.1%
5	3/2012 - 2/2013	17.5%	1.1%	16.3%
6	3/2013 - 2/2014	0.5%	0.6%	-0.2%
7	3/2014 - 2/2015	2.0%	1.2%	0.8%
8	3/2015 - 2/2016	-6.0%	1.6%	-7.6%
9	3/2016 - 2/2017	25.5%	0.7%	24.8%
Compounded Total		76.8%	21.0%	55.7%

Up until April 2013 returns were quite good but then market conditions pulled returns below normal for the next 3 years. By February 2016 the market for these securities was extremely undervalued based on several indicators. Subsequently these extremes were reversed; all the returns we expected over the last four years came in the last year. We should not expect returns as high as the last year, except in cases where the portfolio has done poorly for some time and there is a "catch up year". Likewise, as we've seen, even 3 bad years in a row doesn't mean we won't earn long term returns in line with our expectations. The lesson here is that fixed income portfolio returns are mean reverting. Investors who bail out of a long term strategy after a period of below normal returns will miss the rebound that inevitably comes.

Given the results of the last year compared to the prior 3, its worth repeating a key paragraph from last year's newsletter:

"It is well known that many (probably most) investors do not achieve the returns that they should because there is the tendency to sell when the "return spring" has been compressed to the bottom and future returns are poised to recover a recent downturn. Likewise, people want to buy when the spring has stretched upward - when they should be just holding or even paring back. A substantial part of the value of an advisor is that we can help you to resist this source of long term return erosion so that you can earn the returns commensurate with the original purchase price. In my opinion the next 3 years will produce much higher returns than average and make up for the past 3 years - even if the bond spring just returns to neutral." – March 2016 Newsletter

Berkeley Investment Advisors
Investment Newsletter – March 2017

Having covered the big picture, let's explore some of the technical factors underlying recent performance. A major factor in the return pattern over the last 4 years is the oscillation of risk premiums for high yield bonds. Credit spreads rose by 2.77% from February 2013 to February 2016 – which pushed high yield bond prices down. The spreads then reversed course over the last year, declining by 4.01% and pushing prices back up dramatically. As of 2/28/2017 the index of high yield spreads was at 3.74%. The median spread since 1996 is 5.19% so the current market rates are on the low side. This makes sense given that the market is expecting new policies that will likely increase corporate profitability and lower credit risks. So while risks are probably lower than usual, we'll get lower yields at current market prices.

The flow of retail investor dollars into and out of CEFs roughly follows bond prices. In order to quantify this, we've collected the price discounts to NAV on a group of 7 CEFs since January 2008. We have owned all of these CEFs at one time or another - depending on their characteristics relative to other securities. As high-yield bond prices dropped, (and therefore future returns increased) retail investors sold, pushing CEF prices to deeper discounts. The average discount on the 7 CEFs mentioned, expanded by 15.1% from February 2013 to February 2016. Then as bond prices recovered over the last year, retail investors bought CEFs pushing prices back up and reducing discounts by 8.8%. Our average discount for the portfolio has not declined as much because we sell funds with low discounts and buy others with higher discounts. Currently the weighted average discount for CEFs in the Short Term Income portfolio is 7.5%. By comparison the median of the time series of the 7 CEF average discounts since January 2008 is 6.7%.

The bottom line to this story is that after three years of depressed returns, the closed-end funds rebounded as expected, though much faster than expected. This has given us excellent returns over the last year so that on a cumulative basis we are back on track with what we expect for this strategy. Overall the current portfolio yield before fees is 7.25%. Therefore my expectation is that a client with fees at 1.25% will likely earn returns around 6% over the next five years.

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