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Leverage among Closed-end Funds

One of the most salient features of closed-end funds relative to similar investment products is their ability to leverage their assets. In other words, an income closed-end fund, for example, may borrow assets at a lower rate than the rate at which it can invest those assets in order to enhance its yield to its shareholders. This advantage comes at the expense of increased net asset value volatility, which can be appreciated or unwelcome depending on the changes of the underlying market.

Types of Leverage

Closed-end funds employ one or more types of leverage such as preferred stock, a loan, a note, commercial paper, reverse repurchase agreements or dollar rolls. Sometimes, a type of fund uses the same form of leverage. For example, all municipal closed-end funds leverage their assets by issuing preferred stock; most high yield funds borrow assets in the form of a loan; mortgage funds use dollar rolls and/or reverse repurchase agreements.

Leverage Ratio

Closed-end funds typically have a leverage ratio of about 33%. In other words, a fund with \$100 million in net assets may borrow \$50 million, so that the borrowed amount (\$50 million) is 33% of total assets (\$150 million). Only funds that issue preferred stock to leverage their assets may actually have a leverage ratio of up to 50%. Still, only a handful of the funds that leverage their assets by issuing preferred stock have a leverage ratio above 40%.

The Effect of Changes in Interest Rates on a Leveraged Fund's Net Asset Value

An example will help illustrate the effect of changes in interest rates on a leveraged fund's net asset value. We will simplify our example by ignoring any operating expenses for clarity purposes. Let's assume *The Leveraged Income Trust*, a fixed income closed-end fund with 10 million shares, is able to invest its assets in fixed-income securities yielding 8%. Furthermore, the fund leverages its assets by issuing preferred stock at a cost of 5% and at a 33% leverage ratio. As shown in Table 1 below, the resulting yield of *The Leveraged Income Trust* is 9.5% to its shareholders. Meanwhile, *The NonLeveraged Income Fund* invests all of its \$100 million in assets at 8%, which is also the yield this fund can offer to its shareholders. (Remember that these "dream" funds do not have any expenses). Thus, in this case, the yield of *The Leveraged Income Trust* is almost 19% higher than that of *The NonLeveraged Income Trust*.

Table 1: Effect of Leverage on a Fund's Yield

	The Leveraged Income Trust	The NonLeveraged Income Trust
NAV	\$10.00 per share	\$10.00 per share
Net Assets	\$100 million (at 8%)	\$100 million (at 8%)
Leverage	\$50 million (at 5%)	\$0 million
Total Assets	\$150 million	\$100 million
Yield	9.5% or $(\$100 + \$50) * 8\% - \$50 * 5\%$	8%
	\$100	

Let's now assume that interest rates rise, which cause the funds' *total* assets to decline by 10%. Since the trust's borrowed assets remain constant, the change in *net* assets of a leveraged fund is exaggerated by changes in interest rates, as shown on Table 2 below. In this case, a 10% market decline results in a 15% decline in the net asset value of *The Leveraged Income Trust*. On the other hand, a 10% market decline translates into an identical 10% net asset value decline of *The NonLeveraged Income Trust*.

Table 2: If the market falls by 10%...

	The Leveraged Income Trust	The NonLeveraged Income Trust
Total Assets	\$150 million	\$100 million
Total Assets After 10% Market Decline	\$135 million	\$90 million
Leverage	\$50 million (unchanged)	\$0 million
Net Assets	\$85 million ($= \$135 \text{ million} - \50 million)	\$90 million
NAV	\$8.50 per share	\$9.00 per share
NAV decline	15%	10%

The changes in net asset value are also magnified in a bull market. Next, let's assume that interest rates fall causing the trust's *total* assets to increase by 10%. As shown in Table 3 below, the 10% increase in the market resulted in a 15% increase in the net asset value of *The Leveraged Income Trust*. Meanwhile, a 10% market increase causes the net asset value of *The NonLeveraged Income Trust* to increase by the same 10%. In other words, leveraged funds tend to outperform comparable nonleveraged funds in a bull market.

Table 3: If the market rises by 10%...

	The Leveraged Income Trust	The NonLeveraged Income Trust
Total Assets	\$150 million	\$100 million
Total Assets After 10% Market Increase	\$165 million	\$110 million
Leverage	\$50 million (unchanged)	\$0 million
Net Assets	\$115 million (\$165 million - \$50 million)	\$110 million
NAV	\$11.50 per share	\$11.00 per share
NAV increase	15%	10%

In summary, the incremental yield of a leveraged closed-end fund usually comes at the expense of higher net asset value volatility relative to a similar nonleveraged fund. This in turn may be positive for a fixed-income fund in a declining rate environment, but negative during rising interest rates.

Municipal closed-end funds offer a clear example of how leverage has exaggerated the net asset value performance in different market environments. As shown on Table 4, the net asset values of nonleveraged funds on average outperformed those of leveraged funds in bear markets such as 1994 and 1999. On the other hand, the net asset values of leveraged funds outperformed those of nonleveraged funds in bull markets such as those in 1993, 1995 and 1997.

Table 4: Average Net Asset Value Returns of Municipal Funds in Bear and Bull Markets

	Leveraged Municipal Funds	Nonleveraged Municipal Funds
Bear Markets		
1994	(9.8%)	(3.9%)
1999	(6.5%)	(2.2%)
Bull Markets		
1993	15.0%	12.1%
1995	23.0%	17.2%
1997	11.2%	9.3%

The Effect of Changes in Interest Rates on a Leveraged Fund's Dividend

Again, an example will better help illustrate the effect of changes in interest rates on a leveraged fund's dividend. We simplified our example by ignoring any operating expenses. Let's assume the cost of leverage rises to 7% from 5%. In that case, the earnings rate of the fund would decline, which would probably be eventually reflected in a dividend reduction. In our example, the earnings rate declined by almost 11% — to 8.5% from 9.5% —, as shown in Table 5. Leveraged closed-end funds reduced their dividends after interest rates rose in 1994 and 1999.

Similarly, if the cost of leverage declines, a fund's earnings rate would increase, which may eventually be followed by a dividend increase or a rise in the fund's dividend reserve.

Table 5: Effect of a Change in the Cost of Leverage on a Fund's Earnings Rate

Cost of Leverage	5%	rises to 7%	drops to 3%
Net Assets	\$100 million (at 8%)	\$100 million (at 8%)	\$100 million (at 8%)
Leverage	\$50 million (at 5%)	\$50 million (at 7%)	\$50 million (at 3%)
Earnings Rate	9.5% or $((\$100+\$50)*8\% - \$50*5\%)$	8.5% or $((\$100+\$50)*8\% - \$50*7\%)$	10.5% or $((\$100+\$50)*8\% - \$50*3\%)$
	\$100	\$100	\$100

Conclusion

Leverage is a unique feature of closed-end funds, specifically income funds. Leveraged fund investors must understand how leverage works and how it affects the net asset value and the dividend of a closed-end fund under different market environments.

Additional information is available upon request.

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