

NEW HORIZONS: INTRODUCING EXCHANGE-TRADED BOND FUNDS

By Albert J. Fredman

Bond ETFs offer benefits similar to those of stock ETFs, such as low cost, diversification, the ability to trade shares throughout the day, and the ability to short a portfolio. All eight bond ETFs feature rock-bottom 0.15% expense ratios—a major plus for fixed-income portfolios, particularly during times of low returns such as those we are experiencing currently.

From the time the bull market in equities ended in March 2000 to September 2002, the Lehman Brothers aggregate bond index climbed 29% while the Wilshire 5000 equity index tumbled 44% (returns cover the period 3/31/00 to 9/30/02). Treasury notes and bonds fared well because low inflation and a weak economy enabled the Federal Reserve to lower interest rates substantially, causing fixed-income securities to appreciate. In addition, uncertain times prompted the stampede to quality by investors seeking a safe haven.

It's not difficult to see why bonds became the asset class of choice. Bond funds drew billions of dollars of investor money out of equity funds last year.

Going forward, the so-called equity premium (the excess of equity market returns above default-free Treasury rates) is likely to be far more modest over the next 10 years or so than its long-term average of about 7%.

DECOUPLING

Bonds are an important component of a well-diversified portfolio because of their low correlation with equity market returns. There are benefits to diversification whenever asset returns are less than perfectly positively correlated (or when the correlation is less than +1.0). The lower the correlation, the better. A typical correlation between bond and equity market returns is +0.2, which is low enough to produce substantial diversification benefits.

However, the benefits of diversification become far greater when correlation coefficients are negative. The classic article "Decoupling" by Les Gulko (in the Spring 2002 Journal of Portfolio Management) demonstrated that the normally positive correlation between U.S. stocks and Treasury bonds decouples and turns into the highly beneficial negative correlation during times of crises in the financial markets. Treasury bonds increase in price as stocks plunge to ever-lower levels, comforting well-diversified investors. The increased acceptance of the U.S. dollar as a safe haven for global investors in chaotic periods has strengthened the decoupling effect.

Thus, the diversification benefits of longer-term Treasury securities kick in when most needed by uneasy individuals. This strong negative correlation cannot be obtained from money market funds. Such funds do not lose principal value, but their prices do not increase either.

BOND ETFs 101

The introduction of four bond exchange-traded funds, or ETFs, by Barclays Global Investors in July 2002 proved quite timely. Then, on November 1, 2002, ETF Advisors launched four additional bond ETFs. As I will explain, important differences exist between the Barclays' iShares Treasury ETFs and those managed by ETF Advisors. The latter are FITRs, or Fixed Income Trust Receipts (known as "fighters").

An ETF is an index fund that trades throughout the day like a stock. Since

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year-end 1995, ETF assets have grown at a 107.2% average annual rate, far in excess of the 16.4% rate for conventional mutual funds. Prior to the recent bond ETF launchings, all U.S.-based ETFs had focused on equities. As evident in Table 1, seven of the eight bond ETFs focus on Treasuries and one targets investment-grade corporates. All trade on the American Stock Exchange. Assets of the eight total

about \$4 billion, representing about 5% of the money invested in all ETFs. Expected to come to market in 2003 are a bond ETF that tracks the comprehensive Lehman Brothers Aggregate bond index and another that focuses on Treasury Inflation-Protected Securities, or TIPS. With an increasingly wide array of stock and bond choices, it is now possible to build an all-ETF portfolio.

Bond ETFs work like their stock counterparts. Like equity ETFs, bond ETF share prices may deviate from their net asset values, producing tiny premiums or discounts throughout the trading day. Each fund has both a stock symbol and an IOPV (Indicative Optimized Portfolio Value) ticker (Table 1). The IOPV approximates the fund's net asset value and is updated every 15 seconds through the trading day. By comparing the IOPV and real-time stock quote for an ETF, you can approximate any discounts or premiums that might occur. You can also determine a bond ETF's end-of-day discount or premium based upon its net asset value (computed daily at the market close) and last traded price. This information can

TABLE 1. BOND ETFs AT A GLANCE

Bond ETF (Underlying Index)	Amex Ticker	IOPV Ticker	Number of Holdings* (Fund/Index)	Portfolio Duration* (Years)	Expense Ratio (%)
iShares Lehman 1-3 Year Treasury Bond (Lehman Bros. 1-3 Year US Treasury index)	SHY	SHZ	9/31	1.66	0.15
iShares Lehman 7-10 Year Treasury Bond (Lehman Bros. 7-10 Year US Treasury index)	IEF	IEN	7/12	6.39	0.15
iShares Lehman 20+ Year Treasury Bond (Lehman Bros. 20+ Year US Treasury index)	TLT	TLZ	18/18	12.90	0.15
iShares GS \$ InvesTop™ Corporate Bond (GS \$ InvesTop™ index)	LQD	DLL	100/100	6.41	0.15
Treasury 1 FITR (Ryan 1 Year Adjusted Treasury index)	TFT	TFZ	6/2	0.90	0.15
Treasury 2 FITR (Ryan 2 Year Adjusted Treasury index)	TOU	TOG	6/1	1.90	0.15
Treasury 5 FITR (Ryan 5 Year Adjusted Treasury index)	TFI	TFV	7/1	4.60	0.15
Treasury 10 FITR (Ryan 10 Year Adjusted Treasury index)	TTE	TTY	6/1	7.90	0.15

*As of 11/30/02.
Source: Barclays Global Investors (www.ishares.com) and ETF Advisors (www.etfadv.com).

be found most readily at the Web sites for Barclays Global Investors (www.ishares.com) and for ETF Advisors (www.etfadv.com). Keep in mind, however, that bond quote and price reporting is less well-developed than stock quote and price reporting, making the IOPV and net asset value less reliable for bond ETFs. Fortunately, bond quotes and price data are improving.

As with bonds themselves, the prices of bond ETFs vary inversely with the level of interest rates—i.e., rising rates lead to falling fixed-income security prices and vice versa. Like most bond funds, fixed-income ETFs do not pay a fixed rate of return and do not guarantee that your investment will be recouped when you cash out. Bond ETFs pay monthly dividends in cash. Individuals interested in reinvesting their dividends should contact their brokers for further information, including any fees. Many brokers charge no fee for dividend reinvestment and will carry fractional shares.

Bond ETFs offer benefits similar to those of stock ETFs, such as low cost, diversification, the ability to

trade shares throughout the day, and the ability to short a portfolio. All eight bond ETFs feature rock-bottom 0.15% expense ratios—a major plus for fixed-income portfolios, particularly during times of low returns. Tax efficiency, a major advantage for stock ETFs, would not be a relevant consideration with bond ETFs because of their income orientation. Like Treasury securities themselves, Treasury bond ETFs generate income that is subject to federal income tax but should be exempt from state and local income taxes if the fund sponsor and the shareholder meet the state's administrative requirements.

The iShares GS Corporate replicates its underlying target index, but the other bond ETFs work differently: The other iShares bond ETFs use optimized sampling techniques, while ETF Advisors use a duration and cash flow matching technique for their Treasury FITRs to minimize benchmark-tracking errors. Because bonds have a given life span before they mature, a bond ETF portfolio needs to be reconstituted frequently, reflecting changes in its target index. This process could lead

TABLE 2. COMPARING BOND PORTFOLIO CHOICES

Feature	ETF	Closed-End Fund	Ordinary Mutual Fund
Pricing	Real-time share price. Portfolio values updated throughout day. May trade at tiny discounts or premiums.	Real-time share price. End-of-day net asset value. May trade at substantial discounts or at steep premiums.	End-of-day net asset value.
Trading shares	Trades as a stock. Can use limit orders to buy or sell at your price or better.	Trades as a stock. Can use limit orders to buy or sell at your price or better.	Transactions normally occur at the end-of-day net asset value.
Average expense ratios	0.15%.	1.05% for managed government and corporate bond funds.	0.35% for index-based funds; 1.05% for managed government and corporate bond funds.
Portfolio choices	Limited at present to Treasury and high-grade corporate portfolios.	Wide assortment of taxable and tax-free portfolios.	Wide assortment of taxable and tax-free portfolios.
Transaction costs	Brokerage commission, bid-asked spread, and potential price impact of large trades.	Brokerage commission, bid-asked spread, and potential price impact of large trades.	Generally none if no-load fund is purchased through fund company.
Leverage	Unleveraged.	Many use leverage to boost yields, which adds volatility.	Unleveraged.
Transparency	Portfolio of bonds disclosed monthly or even daily.	Portfolio of bonds must be reported at least semi-annually.	Portfolio of bonds must be reported at least semi-annually.

Source: Expense ratios provided by Morningstar, Inc.

to some capital gains distributions. You could generally expect a bond ETF to have a higher portfolio turnover rate than the broad-based equity ETFs tracking benchmarks like the S&P 500, Dow Jones industrial average, and the Wilshire 5000.

TREASURY FITRS

The four Treasury FITRs portfolios are uniquely managed to maintain target maturities of one, two, five, and 10 years, respectively. Treasury FITR ETFs have no maturity themselves, but they allow investors to remain at a particular point on the yield curve. FITRs are based upon consistent-maturity indexes of “on-the-run” U.S. Treasury securities compiled by Ryan Labs, Inc. (see www.ryanindex.com). An on-the-run Treasury is the most recently

auctioned Treasury bill, note or bond of a stated maturity. Such securities are the most liquid of all Treasuries. The on-the-run Treasury yield is the basis for all trading in U.S. dollar-denominated debt in its maturity range. For example, five-year corporate debt is quoted at the five-year on-the-run Treasury rate plus a credit-quality spread. The U.S. Treasury regularly auctions debt securities at various initial maturities, ranging from three-month Treasury bills to the 10-year Treasury note. The indexes used as Treasury FITR benchmarks are calculated by assuming that a new on-the-run issue regularly replaces a corresponding old on-the-run Treasury.

The Ryan 2 Year Treasury index is the underlying index of the Treasury 2 FITR. This index is invested in the latest two-year Treasury note. Similarly, the Treasury 5 and 10

FITRs target Ryan indexes containing positions in the latest five- and 10-year Treasury notes, respectively. With the elimination of the 12-month T-bill in 2001, the index for the Treasury 1 has become a weighted composite of two issues. The most recently issued six-month T-bill and two-year T-note are weighted two-thirds and one-third, respectively, in the Ryan 1 Year Adjusted Treasury index. While the benchmark index of each FITR is based only on one or two on-the-run securities, the ETF itself will typically hold four to 10 securities so as to track the index return as efficiently as possible. Treasury FITRs may hold some off-the-run Treasuries and other government securities to improve returns. The portfolio will be designed to have lower turnover than a manager simply rolling the index security (or securities) would experience.

For further details on Treasury FITR ETFs and Ryan index methodology go to the ETF Advisors Web site (www.etfadvisors.com). Complete information on the iShares bond ETFs is found at www.ishares.com.

COMPARISON SHOPPING

Table 2 compares bond ETFs with closed-end bond funds and ordinary mutual funds. Trading bond-fund shares on a stock exchange is not new. About two dozen closed-end bond funds came on-stream in the early 1970s. Today, several hundred such funds are available in a wide range of categories.

The closed-end bond arena includes the highly popular leveraged municipal bond funds (see my January 2002 *AII Journal* column). Many taxable closed-end bond funds also leverage up their yields. Of course, leverage adds volatility to an otherwise equivalent non-leveraged portfolio and can result in greater loss of principal during times of rising interest rates. Another major distinction between closed-end and ETF bond portfolios is that the latter are index-based while the former are actively managed, which adds a layer of management risk. Thus, bond ETFs offer investors a more precisely defined portfolio with far lower expenses.

In addition, many investors find the fluctuating discounts and premiums of closed-end funds confusing and frustrating. Conversely, ETFs generally trade close to their net asset values. That's because if the ETF falls to a significant discount, professional arbitrageurs buy the shares and turn them in to the fund in exchange for the more highly valued bond holdings. Arbitraders profit from keeping share prices close to net asset value.

Some investors may like to buy a closed-end bond fund at an abnormally deep discount to secure a higher yield on their investment,

while also hoping to capture a stock market profit from the eventual narrowing or disappearance of the discount. Deep discounts tend to be more commonplace when bonds are out-of-favor, as they were in 1999. This strategy takes more homework and considerable patience and discipline.

Traditional bond index mutual funds have existed since 1986. A no-load bond index mutual fund might be more attractive to individuals making small periodic investments, because of the absence of transaction costs. However, a portion or all of the investor's commissions could be offset by the opportunity to lock in a more favorable price with an ETF through the use of limit orders. Mutual fund investors do not have this control over their transaction prices. A bond ETF's lower operating costs clearly benefit long-term, big-ticket investors using limit orders to lock-in their price on relatively large transactions. ETFs are normally able to offer lower expenses than corresponding index mutual funds because they do not incur the costs of maintaining individual shareholder accounts.

Launched in 1986, the \$25 billion Vanguard Total Bond Market Index has grown to become the third largest bond fund. This intermediate-term portfolio tracks Lehman Brothers aggregate bond index, the benchmark of choice for the majority of indexed bond assets. Including nearly 7,000 issues, it encompasses a

wide spectrum of fixed-income investments. With a 0.22% expense ratio, Total Bond Market compares favorably with the average bond index fund's 0.35% expense ratio, and the average managed fund's 1.05% expense ratio, according to Morningstar. Vanguard also offers short-, intermediate-, and long-term index funds tracking their respective Lehman Brothers indexes (see my January 2001 *AII Journal* column).

IMPACT OF EXPENSES

Because bonds return less than equities over the long run, expenses take a much larger percentage bite out of returns. Keep the following equation in mind when shopping for a bond fund:

$$\text{Net Return} = \text{Gross Return} - [\text{Expense Ratio} + \text{Transaction Costs}]$$

Expense ratios on high-cost, low return bond funds may devour up to 25%, or more, of the gross return. Transaction costs associated with a fund's portfolio turnover take an additional bite out of returns. Tapping into the high-quality taxable bond market can be done most economically through a low-cost index fund.

Table 3 illustrates the impact of expense ratios on returns by comparing a hypothetical bond index ETF that has a 0.15% expense ratio with the average actively managed

TABLE 3. HOW HIGH EXPENSE RATIOS ERODE YIELDS

	Gross Yield (%)	Expense Ratio (%)	Net Yield (%)	Gross Yield Consumed by Costs (%)
<i>Period of high yields</i>				
Average managed bond fund	8.00	1.00	7.00	12.50
Bond ETF	8.00	0.15	7.85	1.88
<i>Period of low yields</i>				
Average managed bond fund	3.00	1.00	2.00	33.33
Bond ETF	3.00	0.15	2.85	5.00

bond fund charging 1%. The 0.15% bond ETF expense ratio is even lower than the 0.35% average expense ratio for bond index mutual funds.

During times of high yields, the managed bond fund consumes 12.5% of gross yield versus only 1.88% for the bond ETF. With lower interest rates the impact of costs takes a much larger bite—33.33% of a 3% gross yield in the case of the managed fund. The impact on returns is even greater than shown in Table 3 when you consider the higher transaction costs associated with an actively managed bond fund. This yearly performance edge can compound to a significant sum over time, particularly with a large dollar investment.

Many frugal investors buy Treasury securities directly, thereby avoiding the ongoing expense ratio and built-in transaction costs of a fund. With a Treasury Direct Account you can purchase any Treasury, including TIPS (go to the Treasury Direct Web site, www.treasurydirect.gov, for information and on-line purchases). Uncle Sam backs Treasuries, so credit risk does not exist. That also means there's no research work or ongoing monitoring efforts required. Treasury Direct allows you to buy without paying a commission. Plan on holding to maturity, however, to avoid the transaction costs on a sale. You can sell through the Treasury Sell Direct program for a \$34 fee per security or have the Treasuries transferred to your broker to sell them in your brokerage account. Most people who buy through Treasury Direct intend to hold to maturity.

TARGETING MATURITIES

Treasury FITRs have special advantages over owning Treasuries directly. In contrast to holding a Treasury security, owning a Treasury FITR gives you a maturity exposure that remains constant. Once you buy a five-year Treasury

note, for example, its remaining life continually decreases. To maintain ongoing five-year exposure, you would have to sell your note when a new five-year note is issued in three months, buy the new note, hold for another three months, sell, and so on. Treasury FITRs provide a consistent target maturity. Conversely, the iShares Treasury ETFs track Lehman Brothers indexes, and do not offer maturities as precise as do the FITRs. Rather, they track Treasuries within a target maturity range, including one to three years, seven to 10 years, and 20+ years.

Keeping abreast of the U.S. Treasury yield curve may be helpful to bond investors in making their maturity decisions. The yield curve is a graphical representation of the relationship at a given time among yields on Treasuries with varying maturities. The curve typically slopes upward because longer maturities normally have higher yields. Longer-term securities should pay more because they have greater exposure to adverse price fluctuations. If the curve climbs sharply upward—as it did recently—investors expect rates to rise because they anticipate increasing inflation. (Conversely, the curve may slope downward when investors anticipate decreasing inflation.) A yield curve can be found at www.bloomberg.com by clicking on U.S. Treasuries. Analyzing changes in the yield curve over time provides information that may be helpful in forecasting interest rates.

WEIGHING THE RISKS

Investors must carefully weigh the risks of getting into longer-term bond funds, despite the fact that they may hold top-quality securities. Treasury funds, especially those focusing on Treasuries with maturities exceeding 10 years, face significant risks of losing principal going forward. From their recent multi-decade lows evident as of this writing, interest rates have a lot more room to rise than to fall. Some

have called it a bubble in bonds. Interest rates normally have a floor of zero but there is no ceiling. In early October 2002, the yield on the benchmark 10-year Treasury dipped to 3.57%, a level last seen more than 40 years ago. A few days later, Treasury prices fell and rates rose as the stock market began to surge. (However, a deflation scare could significantly lower yields on Treasury securities.)

Bond prices vary inversely with interest rates. The seesaw relationship between prices and rates turned out to be a bonanza for Treasury investors as the yield on 10-year Treasuries trended down from their 6.44% 1999 year-end value. However, as interest rates rise, bond prices decline. This is known as interest rate risk. The Federal Reserve will likely raise interest rates when the economy eventually experiences a sustainable recovery. For those who allocate most of their assets to bond funds (and maintain relatively minor equity exposure), the most important consideration in selecting a fund is its duration, a measure of interest rate sensitivity. The bigger the duration number, the greater the interest rate risk. Table 1 displays durations for the bond ETFs.

Durations of eight years or more reflect high interest rate risk. If interest rates increase by one percentage point (say, from 6% to 7%), a portfolio with a duration of 10 years would decline in value by about 10% (percentage point change in interest rates multiplied by the duration). Conversely, if the portfolio had a three-year duration, it would drop by just 3%. With its duration of 12.90, the iShares Lehman 20+ Year Treasury ETF would be expected to exhibit the highest volatility. Conversely, with a 1.66 duration, iShares Lehman 1–3 Year Treasury Bond should be fairly stable. Further, the 0.90 duration of Treasury 1 FITRs would result in even greater stability.

Money market funds, with durations of just a few months, have no

interest rate risk. These are the best investments to own during times of sharply rising short-term interest rates. Some investors may want to consider using the shortest duration bond ETFs as adjuncts to a money market fund. Doing so results in a duration extension from three months (for the typical money market fund) to a little less than one or two years for the respective Treasury 1 and 2 FITRs. Unlike a money fund, FITRs do not maintain a stable \$1 net asset value. They expose investors to some risk of principal loss should rates rise. However, those who park a considerable amount of assets in money market funds might consider allocating a portion of those funds not needed for near-term transaction and immediate liquidity purposes to the shortest duration ETFs. Over the 10-year period ended December 2001, the one-year Ryan Treasury index returned 5.47% annually versus 4.97% on the Federal Reserve Commercial Paper Series, which tracks the principal component of money market fund portfolios. The 0.15% bond ETF expense ratios compare favorably to the greater than 0.50% expense ratio of the average money market fund, widening the yield advantage of the Treasury 1 FITR for a modest increase in interest rate risk.

EXPECT THE UNEXPECTED

Recent research indicates that

investors with sizable equity positions would always be wise to maintain a significant portion of their overall portfolios in intermediate-term Treasuries, because these securities offer a dimension of diversification not available through money market funds. Because money funds maintain a stable value, individuals often assume that they are the safest asset to use in diversifying their equity holdings. However, what is safest by itself is not necessarily the best diversifier. The temporary decoupling of U.S. Treasury and equity returns during periods of market crisis provides welcome relief for a well-diversified portfolio. Crises can and often do occur unexpectedly. An all-weather portfolio containing a significant stake (perhaps 40%) in intermediate-term Treasuries provides excellent protection from the unexpected. As clearly evident in the recent bear market, longer-term Treasuries can zig when stocks zag.

The iShares Lehman 7-10 Year Treasury Bond and the Treasury 5 FITR ETFs are good diversifiers for equity portfolios because they have moderate durations (6.39 and 4.60 years, respectively) yet still offer plenty of insurance against stock market crashes.

Putting some funds in a longer-term fund now makes most sense for those who plan to move in gradually, purchasing more shares in the future at lower prices when interest

rates rise and prices fall. This will make the ride psychologically smoother.


CONCLUSION

The prospect of more modest equity returns over the next decade or so has encouraged many individuals to allocate larger proportions of their portfolios to fixed-income securities.

Last year, the iShares and Treasury FITRs brought the fixed-income asset class into the U.S. ETF universe. Investors are encouraged to compare bond ETFs to open- and closed-end bond funds and even to the U.S. government's Treasury Direct program.

Bond ETFs offer a rock-bottom 0.15% expense ratio. A low-cost fund is particularly important with high-quality bonds, which have lower long-run returns than equities. Because of today's low levels of interest rates, investors seeking the safety of Treasuries are advised to lean toward the short end of the yield curve. This will minimize the drop in your fund's net asset value when interest rates rise. However, the intermediate-term Treasury ETFs provide excellent diversifiers for those individuals seeking to lessen the volatility of a significant stake in equities.

In addition, the Treasury 1 FITR can be an attractive component of the money-market portion of your asset allocation. ♦



INVESTOR SURVEYS

As of December 12, 2002

Bullish Sentiment

Most Recent:	41.4%
One Week Ago:	52.9%
One Month Ago:	48.7%

The sentiment survey measures the percentage of individual investors who are bullish, bearish, and neutral on the stock market short term; individuals are polled from the AAI Web site.

Asset Allocation

Stock Funds:	24%	Bonds:	3%
Bond Funds:	11%	Cash:	32%
Stocks:	29%		

The asset allocation survey measures the percentage holdings of members in five asset categories. Members are polled monthly from the AAI Web site; the percentages are averages of all members responding.

Updated Investor Survey results are available at www.aaii.com under *Member Surveys* in the Community area. The Bullish Sentiment Survey is updated every Thursday morning, while the Asset Allocation survey is updated on the first business day of each month.

Voice Your Opinion: Go to www.aaii.com/mempulse/ to tell us what direction you think the market will take in the next months and to let us know where your assets are currently invested.

