

Interest Rate Freight Train

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Since early May, the yield for the benchmark 10-year Treasury note has increased by nearly 100 basis points, highlighting the risk that bond fund investors face in their “safe” investments. For bond funds, rising rates mean that total return has to fight the headwind of losses on the underlying portfolio. As a fund’s net asset value (NAV) declines, coupon interest may not be enough to overcome the price loss. On the other hand, making the same fixed-income allocation to high-quality individual bonds and holding them to maturity is a clearly superior strategy when rates rise because it protects principal and avoids losses in a way that bond funds cannot.

A glimpse at interest rate risk

Interest rate risk in bond funds is like a freight train. You can see it coming long before it hits. The relationship between interest rates and bond fund total return is mathematically simple, but not very intuitive. As rates rise, prices of the underlying bonds in a bond fund fall. If prices fall by more than coupon payments of the bonds in the portfolio, total return becomes negative.

Individual bonds, on the other hand, do not experience the same losses when held to maturity. Instead, high-quality individual bonds will deliver the scheduled cash flows from the coupons and return principal.



Photo Credit: “The Perils of Pauline,” Theodore and Leopold Wharton, 1914

For the past 32 years, falling interest rates have masked the inherent weakness of bond funds when rates rise. It is important to understand the fundamental distinction between an individual bond and a bond fund. Individual bonds represent legal obligations to pay coupon interest and return principal at maturity. That means coupon and principal payments are legally mandated when a bond is held to maturity.

A bond fund has no such legal obligation. It is a pooled portfolio of bonds but without the predictable characteristics offered by individual bonds. It is simply a mutual fund that happens to own bonds.

The last two months provided a sneak peak at the challenges faced by bond fund investors when rates rise. Like a damsel tied to the tracks by a mustachioed silent film villain, bond fund investors sat helplessly as a small rise in interest rates crashed into their portfolios. Table 1 shows the losses experienced in May alone by the three largest bond funds – PIMCO Total Return, Vanguard Total Bond, and Templeton Global Bond – which hold approximately \$475 billion in assets. The average loss was slightly more than 2% even though interest rates on the 10-year Treasury bond only moved from 1.66% to 2.16%. Portfolio turnover, lower credit quality and duration changes, resulting from portfolio managers attempting to squeeze incremental yield out of the portfolio put additional price pressure on the portfolios as rates rose.

Table 1 – May losses in the three largest bond funds¹

Fund	May Return	30 Day SEC Yield	Effective Duration	Average Maturity	Average Rating	Turnover
PIMCO Total Return	-2.15%	2.56%	4.77	6.09	Not Rated	380.0%
Vanguard Total Bond	-1.70%	1.60%	5.31	7.30	AA	80.0%
Templeton Global Bond	-2.19%	2.31%	1.59	2.48	BBB	47.7%

Decomposing bond fund total return

Total return for a bond fund comes from two components: *price return* and *income return*. Price return is the appreciation or depreciation of the bonds in the portfolio, represented by the NAV. The fund's total return represents the blend of negative price return and positive income return. If negative price return outweighs income return then total return is negative. This means that when interest rates are rising, total return for a bond fund will by definition be lower than the yield to maturity of the underlying bonds. Cash flows from a portfolio of individual bonds held to maturity, on the other hand, are unaffected by the intervening price loss.

Rising rates accentuate the fundamental differences between bond funds and individual bonds. When rates rise, an individual bond investor does not sell the bond and thus never recognizes the price loss. Principal is protected and returned when the bond matures.

But turnover from trading by bond fund managers forces the recognition of losses – generating not paper losses, but permanent losses. Table 2 shows the impact of the differences in price return for individual bonds and bond funds when rates rise. Instead of taking the coupon interest and redeeming the principal at maturity with an individual bond, bond fund investors will experience total return below the coupon interest because of the price loss recognized in the fund's NAV.

Table 2 – Bond funds vs. individual bonds when rates rise

	Bond Funds	Individual Bonds
Rising Rates	Price Return ↓	Price Return →
	Income Return ↑	Income Return ↑
	Total Return < Income Return	Total Return = Income Return

Seeing the Oncoming Risks

So how much risk is in bond funds if rates rise? Average effective duration, measured in years, reflects a fund's sensitivity to interest rates. Longer duration funds are more sensitive in rising rates and the underlying bonds will lose more value than a fund with shorter duration. The 30-day SEC yield provides a good representation of a fund's current income return. Funds with higher 30-day yield will be able to offset larger losses before total return goes negative.

¹ May returns quoted by Morningstar, Inc. as of 5/31/2013

Using data from Morningstar, we can estimate the price sensitivity to rising rates in corporate, government and municipal bond funds with short, intermediate and long-term maturities.² Table 3 shows the average effective duration for funds in each of the categories listed (based on averages for over 900 funds sampled on the Morningstar site). Based on Table 3, if rates rise by 1% this year, an investor with \$100,000 in an intermediate-term corporate bond fund would expect to see the value of their holdings drop by about \$4,800. The bond fund’s managers will attempt to offset this loss, of course, by trading to get higher yields in the future, but the recognized price loss will be permanent.

This will come as a nasty surprise to any investor thinks of bond-fund investments as their “safe” money.

Table 3 – Average effective duration

Time Horizon	Corporate	Government	Muni
Short Term	2.0	1.7	2.2
Intermediate Term	4.8	3.7	5.1
Long Term	9.7	13.5	6.7

Tables 3 represents averages. Not all short-term corporate funds have a duration of exactly 2.0, of course. There is a range for each category. Table 4 shows the maximum duration of funds in each category. Any investor who happens to own an intermediate-term corporate bond fund with the highest category duration of 7.3 will lose 7.3%.

Table 4 – Highest duration within each category

Time Horizon	Corporate	Government	Muni
Short Term	3.8	4.1	2.8
Intermediate Term	7.3	5.1	7.1
Long Term	14.7	19.8	8.4

On the other hand, investors may own a bond fund that is at the shorter end of its duration category. Table 5 shows the minimum duration reported by Morningstar for these categories. In this case, an investor who happens to own the intermediate-term corporate bond fund with the shortest duration of 2.5 would suffer a decline of only 2.5% – not good but not as bad as the average.

Table 5 – Lowest duration within each category

Time Horizon	Corporate	Government	Muni
Short Term	0.8	0.8	0.3
Intermediate Term	2.5	1.5	3.2
Long Term	7.0	7.7	4.8

Protecting principal

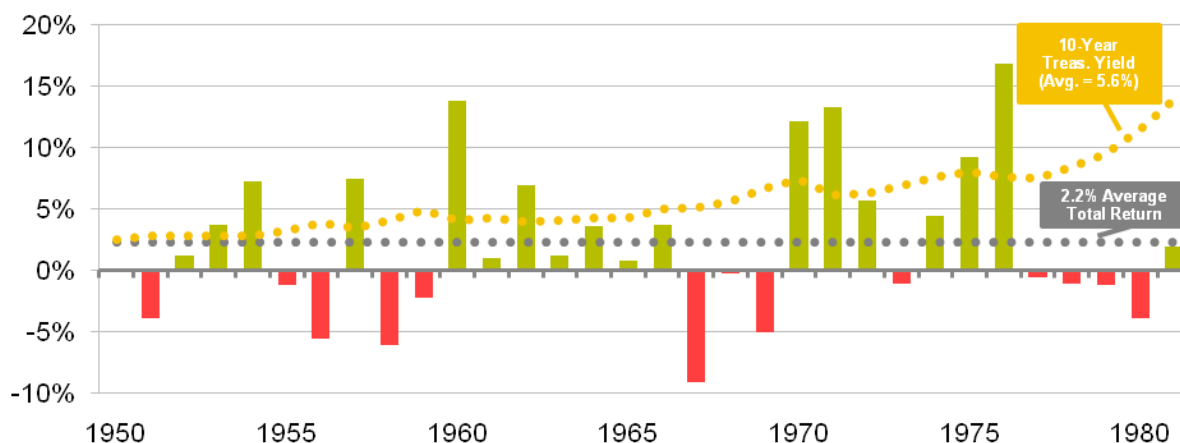
Given the damage that the small rise in interest rates did in May, hopefully investors will now take notice of the risk that is embedded in their bond funds. Thirty-plus years of declining rates has masked

² Figures reported by Morningstar as of May 30, 2013

the erosive effect rising rates has on bond fund returns. The inability to protect principal in a bond fund leads to negative returns when rates rise.

During the rising-rate period from 1950 to 1981, shown in Figure 1, several negative return years and a total return of 2.2% caused the intermediate-government bond index (a common bond fund benchmark) to lag individual bonds. Individual bonds during the same time period returned an average coupon of 5.6%. This 3% improvement compounded over 31 years leads to a significant advantage for investors. For example, \$10,000 invested at 2.2% compounded over the period results in an ending value of \$19,633 in 1981, whereas \$10,000 invested at 5.6% results in an ending value of \$54,148 (2.75-times more money).

Figure 1 - losses for bond funds during rising rates³



The best way to avoid a very foreseeable loss of principal is to sell bond fund holdings while interest rates are still historically low. Figure 2 shows yields on the 10-year Treasury back to 1800. Clearly, from an historical perspective, interest rates are very low (at 1.8%, 2012 was the lowest ever). No one should infer interest rate predictions, however. In a Japanese “lost decade” scenario, interest rates can stay low and flat for many years.

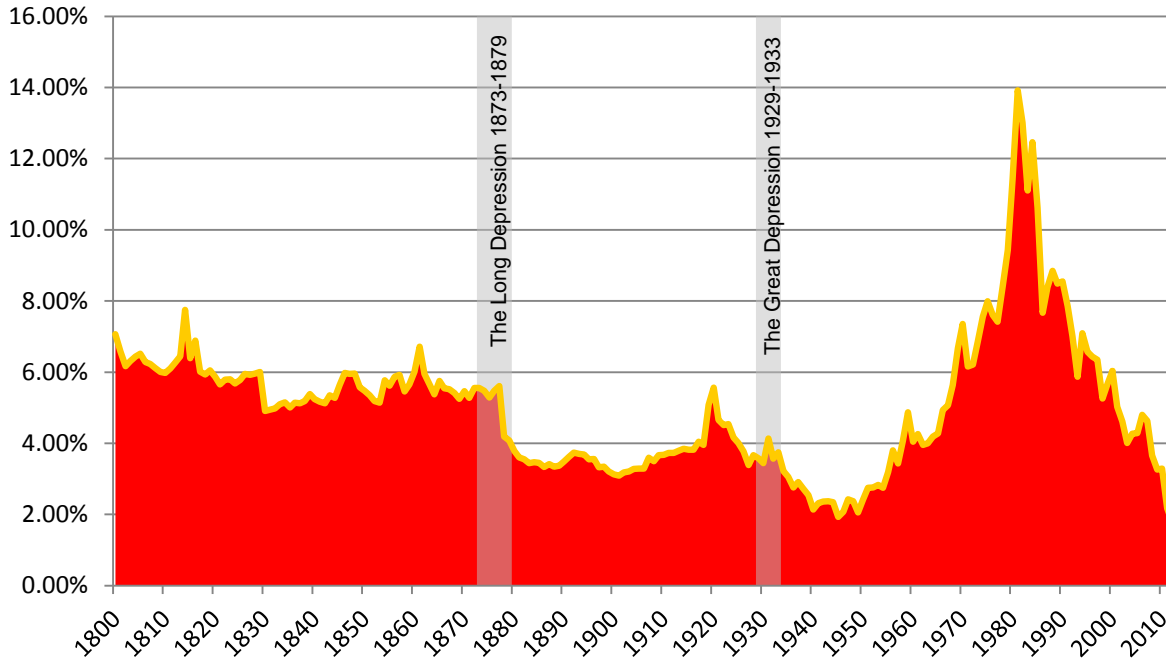
Positive price returns from falling interest rates are a key component to total return for bond funds, and the opportunity for 30 more years of falling rates is very remote. But, the scenario for rising rates, even just to 3% on the 10-year Treasury bond, is much more likely. Tables 3, 4, and 5 illustrated how much a 1% rise in interest rates across the yield curve will hurt bond fund investors in the average, worst, and best cases.

No one knows how likely a 1% interest rate rise would be in any given year. But with little upside potential in bond funds and some clear risks, individual bonds have a distinct advantage for investor’s “safe” money going forward. The simple fact that individual bonds can protect principal makes them a natural alternative to bond funds.

³ The 10-year Treasury index is used as a proxy for bond funds.

Figure 2

10-Year Treasury Bond Yield 1800-2012



Source: Asset Dedication, U.S. Treasury, and Global Financial Data. Data through 12/31/2012

As Kenny Rogers said in his song *The Gambler*, “know when to hold ‘em and know when to fold ‘em.” For bond fund investors, now is a good time to “fold ‘em” and protect gains made while rates were falling by shifting the proceeds into predictable individual bonds. Keeping fixed income allocations in bond funds rather than individual bonds is a bad bet in 2013.

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