

Fixed Income - Duration - April 2022

Overview of bond risks

Repayment

Yield

Price Volatility

What is duration?

Similar to maturity, but considers interest payments during term.

A calculation of the time it takes to get your money back.

Example of 10 year bond, with 3% interest rate

\$10,000 10 year bond, 3% interest (\$300 per year)

Duration about 7.5 years.

During the 10 year term of the bond, you got \$3,000, or 30% of your money back from interest payments. Then you get your entire investment principal (\$10,000) repaid in ten years. The 7.5 years represents getting paid \$300 per year for ten years, then the present value of getting \$10,000 in ten years.

Use of duration

It measures the change in the market value (not the principal) of the bond, due to changes in interest rates. The longer the term, the longer the duration and the greater impact on price from changes in interest rates.

Example: a 1% rise in the 10 year interest rate (to 4%) = a 7.5% loss in market value for the bond.

$1\% \times 7.5 \text{ years} = 7.5\% \text{ loss in value.}$

If you sold the bond after the 1% rise in rates, it would sell for \$9,250.

If rates on 10 year bonds declined 1%, to 2%, then the bond would rise in value by 7.5%, to \$10,750.

Changes in bond prices resulting from changes in interest rates.

The bond principal does not change because of changes in interest rates. The market value (what you can sell it for now) does change.

Example. You own a \$10,000, ten year bond, with a 3% interest rate. Rates on ten year bonds increase to 4%. But your bond is paying you 3% until maturity; you are getting below market interest rates for the bond. If you sold the bond today, you would not get \$10,000 for it. You would get \$9,250 for it. The buyer of the bond would earn a yield of 3.24% (\$300 per year in interest / \$9,250 he paid for the bond) plus a capital gain of \$750 when the bond matures.

Bond funds

“Bond funds never mature.” True. The bonds in funds (mutual funds, ETFs, CEFs) mature and are replaced by similar, new bonds. Bond funds have durations, consisting of the weighted average of the durations of the bonds in the funds. And the yield from interest payments in bond funds changes with the changes in interest rates. Short term bond funds experience rapid changes in yields with changes in short term interest rates.

Impact of a 1% rise in rates on six bond ETFs

Vanguard Short-Term Corporate Bond ETF (VCSH)

12 month yield - 1.60%

SEC yield - 2.81% (The SEC yield is the last month's yield x12)

Duration - 2.76 years

Market value change from a 1% change in interest rates - 2.76%

I Shares 5-10 Years Investment Grade Bond ETF (IGIB)

12 month yield - 2.46%

SEC Yield - 3.32%

Duration - 6.41 years

Market value change from a 1% change in interest rates - 6.41%

I Shares I Boxx investment Grade Corporate Bond ETF (LQD)

12 month yield - 2.48%

SEC yield - 3.37%

Duration - 9.66 years

Market value change from a 1% change in interest rates - 9.66%

SPDR Bloomberg High Yield Bond ETF (JNK)

12 month yield - 4.50%

SEC yield - 5.73%

Duration - 3.82 years

Market value change from a 1% change in interest rates - 2.82%

Schwab Short Term US Treasury ETF (SCHO)

12 month yield 0.38%

SEC yield - 1.84%

Duration - 1.96 years

Market value change from a 1% change in interest rates - 1.96%

I Shares 20+ years Treasury Bond ETF (TLT)

12 month yield - 1.70%

SEC yield - 2.27%

Duration - 19.24 years

Market value change from a 1% change in interest rates - 19.24%