

Bond Pricing

Consider the following recent newspaper article:

Bond prices dropped Thursday. The price of the benchmark 10-year Treasury note dropped 3/4 point, or \$7.50 per \$1,000 in face value. Its yield climbed to 3.67 percent from 3.57 percent Wednesday. The 30-year Treasury bond slipped 31/32 point, or \$9.69 per \$1,000 in face value, to yield 4.72 percent, up from 4.66 percent on Wednesday.

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Question

Relate the changes in the bond price and the bond yield via the concept of duration. According to the numbers presented, what is the duration for the 10-year note and for the 30-year bond?

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Formula

Of course the bond price and the bond yield move in opposite directions.

The approximate formula relating the bond price and the bond yield is

$$\frac{\Delta \text{Present Value}}{\text{Present Value}} = -\text{Duration} \times \Delta R.$$

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10-Year Note

For the 10-year note,

$$\Delta R = .0010$$

$$\frac{\Delta \text{Price}}{\text{Price}} = -.0075.$$

Hence the implied duration is

$$\text{Duration} = -\frac{(-.0075)}{.0010} = 7.5 \text{ years.}$$

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30-Year Bond

For the 30-year bond,

$$\Delta R = .0006$$

$$\frac{\Delta \text{Price}}{\text{Price}} = -.00969.$$

Hence the implied duration is

$$\text{Duration} = -\frac{(-.00969)}{.0006} = 16.2 \text{ years.}$$

Of course the duration is longer for the 30-year bond.

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