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.

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?

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

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

10-Year Note

For the 10-year note,

$$\Delta R = .0010$$

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

Hence the implied duration is

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

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.