Since last month, interest rates have risen across the board, with a surge in long rates steepening the yield curve. The 3-year, 3-month spread has increased from 70 to 102 basis points, finally moving above its long-run average of 80 basis points. Rates have shown an even larger change since the beginning of the year, with the 30-year rate rising 95 basis points since January. Many press accounts attribute these moves to expectations of Fed tightening, though Fed rate hikes generally flatten the yield curve, as long rates rise less than short rates.

Coupon payments mean that a bond is, in effect, a portfolio of many bonds, and the yield a corresponding average of yields on many maturities. One way to get a clearer view of the relation between yield and maturity is to look at zero-coupon bonds. Another way is to adjust the maturity of the bond to be an average of the principal and coupon payment dates, calculating the asset’s duration. This allows a plot of yield against duration. The two approaches are similar but not identical: Both measures emphasize the hump in the yield curve, but they place it in different areas.

Duration also measures how a permanent change in interest rates will affect the price of a bond. If one plots the bond price against interest rates (the chart shows this for a simple consol), the slope of that plot at a specific rate gives a good idea of the duration. The relation between price and rate is nonlinear, though, so that duration changes with the rate: The way it changes is a bond’s convexity. Long bonds have significantly higher convexity than short bonds.