

EXAM FM QUESTIONS OF THE WEEK

S. Broverman, 2006

Week of September 4/06

Smith buys a 20 year bond with face and maturity amount \$100,000. The bond is callable by the issuer on any coupon date starting with the 16th coupon date. The bond has annual coupons at 8% per year. The bond is at an effective annual yield rate of 6%. Just after receiving the 5th coupon, Smith sells the bond. The effective annual yield when Smith sells the bond is 10%. Find the effective annual yield that Smith realized for the period he held the bond.

The solution can be found below.

Week of September 4/06 - Solution

When the bond is initially bought, the yield rate is less than the coupon rate, so the bond is bought at a premium, and the callable bond price is based on the earliest possible redemption date of 16 years from issue. The initial bond price is

$$100,000v_{.06}^{16} + 8000a_{\overline{16}|.06} = 120,211.79 .$$

When the bond is sold at the end of 5 years, there are 15 years remaining on the bond. Since the yield is 10%, which is greater than the coupon rate, the bond is bought at a discount. The callable bond price is based on the latest possible redemption date of 15 years (the remaining lifetime of the bond). The bond is sold for

$$100,000v_{.1}^{15} + 8000a_{\overline{15}|.1} = 84,787.84 .$$

Smith's effective annual yield for the 5 years he held the bond is j , where

$$120,211.79 = 84,787.84v_j^5 + 8000a_{\overline{5}|j} .$$

Using the BA II PLUS with

$N = 5$, $PV = 120211.79$, $PM = -8000$, $FV = -84787.84$,
we *CPT I/Y* to get $I/Y = .8621\%$ is Smith's effective annual yield
for the 5-year period.