Pricing and hedging interest and credit risk sensitive instruments

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http://books.google.com/books?id=2OAkxj2hAkgC&pg=PA52&dq=yield+to+maturity+future+interest&e i=M31YSpcCT7okATNl4GuBw&ie=ISO-8859-1&output=html

3.3 Zero coupon yields

We need the term structure of zero coupon yields because we wish to price instruments whose cash flow may be paid at any arbitrary date in the future. If we were to use yields constructed from coupon bonds, then the discount rates thereby obtained will be relevant only for cash flows that have the same structure as the coupon bond. This happens because all yields to maturity assume that intermediate cash flows are reinvested at the yield to maturity. This implies that the yield to maturity of a bond is a weighted average of the periodic interest rates expected to hold in the future.

To see this, reconsider bond valuation. Suppose we value an 8% semi-annual coupon pay, 6.5-year Treasury bond with a YTM of 8.5%. Diagrammatically, Figure 3.1 shows the valuation equation.

Notice that we are using the same discount rate (the yield to maturity of 8.5%/2) for all cash flows, so if we were to ‘go the other way’ and find the present value, we are implicitly assuming that future coupon payments are reinvested at a constant 8.5%. For example, the total future value from this bond is composed of the future value of the coupon

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Asked yield = Yield to maturity = Internal rate of return = Discounted yield to maturity of a bond over a fixed investment period. \(<\text{Asked yield} = \text{(Coupon income—Asked premium)} / \text{ASKED PRICE}\). Asked yield hence is a function of the Asked (or BID) price. As the bond is only cashed out at maturity, the ASKED PRICE reflects/discounts the future income that is only paid at maturity. Hence the “ASK” or “BID” premium. The consequence however is that Asked yield constitutes a present/discounted value of a future interest (eg the gross bond payout). A 2nd distinction is that Asked yield as consequence of its making as yield to maturity, DOES NOT represent a recurrent cash flow stream in accordance with the mantra of yield maintenance reinvestment protocol.
“RATE 61/2 percent: This is the YIELD that the bond is paying”.

Therefore the listings you will see are benchmarks from which you can determine a fair price (…fair meaning future interest discounted to a present value). Interest rates play a role on bonds in a broad sense. Fixed-income securities, as a rule, will therefore be affected similarly. “You may also ASK/YIELD entry, which gives you the bond’s yield to maturity based on the asking price. This means how much the buyer will earn on the investment based on interest rate, plus how much he or she paid for the bond. A buyer who bought the bond at more than the face value will receive a lower yield-to-maturity value. The opposite is true if the bond was purchased at a discount, which means it was purchased for less than par.”
Because DUS prepayments have been traditionally low, DUS investors usually attribute little value to the potential prepayment penalty collection. In addition some investors doubt the enforceability of the yield maintenance prepayment penalty. However we believe the yield maintenance provisions are fairly enforceable for several reasons. First, yield maintenance is an obligation written into the mortgage note. Consequently, if a borrower refuses to pay yield maintenance, the lien on the property will not be released. Second, if a borrower tries to “manufacture” a default to avoid yield maintenance, Fannie Mae and the DUS servicer have the right to foreclose and take the property. Third, both Fannie Mae and the DUS servicer receive a substantial portion of the penalty, giving them a tangible economic incentive to collect.

As can be seen in both Exhibits 18.4 and 18.5, the total yield maintenance paid by the borrower is a substantial deterrent to prepayment. For example, in the unchanged interest-rate scenario (0bp) in Exhibit 18.5, total yield maintenance paid by the borrower is almost 11 points. If interest rates decline 100bp, the total yield maintenance payment rises above 17 points (Exhibit 18.4).
In may cases the yield maintenance penalty equals the present value of the future cash flows of the commercial loan discounted by the yield of the Treasury with an average life equal to the remaining term of the commercial loan. In this case yield maintenance is truly a prepayment penalty since the lender OR investor receives more than the present value of the lost income.