The Fate Of The Late Great Eight

When they raise the margin, the move's over. While this may not be the ultimate distillation of traders' wisdom, it does reflect our tendency to act too little and too late, and to engage in otherwise meaningless activities as a substitute for solid decision making: When the executives start playing with the organization chart, it's time to update your resume, and what are history's most famous deck chairs?

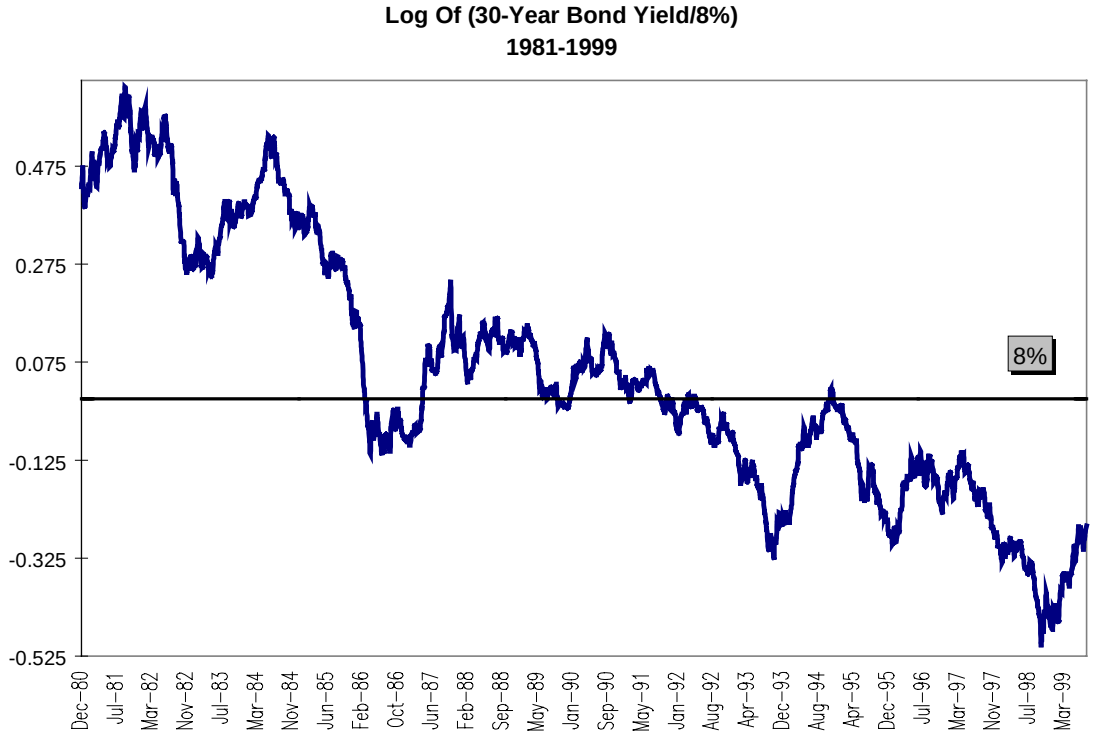
The Treasury bond future contract on the Chicago Board of Trade is one of the great success stories in the history of the futures industry. Its success stems in no small measure from the brilliance of Richard Sandor, who recognized that the viability of the contract would depend on making all bonds potentially deliverable against the contract comparable to one another by converting them all to 8% coupons. This was achieved by constructing conversion factors; the conversion factor formula below is for a bond with no complete quarter remaining after the final semiannual coupon payment:

$$CF = \sum_{t=1}^{N} \frac{C_t}{1.04^t} + \frac{1}{1.04^N}$$

The conversion factor mechanism allowed bond traders to calculate the cash bond cheapest to deliver against the futures contract:

$$\text{Profit} = \$100{,}000 * Future * CF - Bond$$

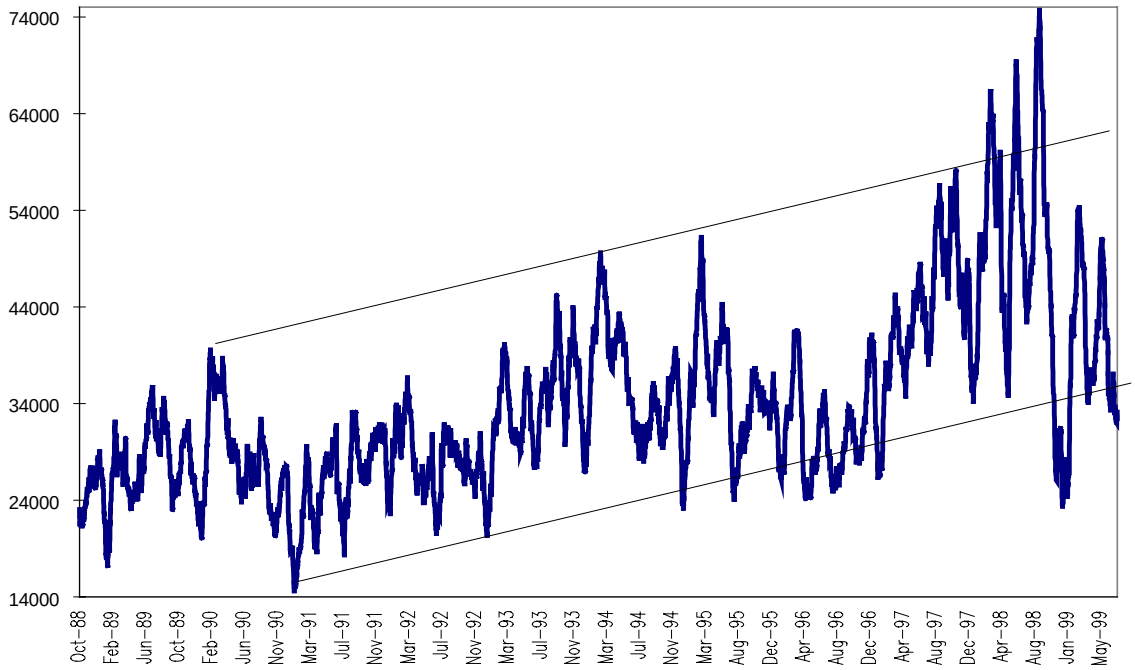
The 8% coupon reflected the world of 1976-1977; it certainly did not reflect either the prior or subsequent world very well. The then-high interest rates of the 1970s rose even further during the early 1980s, leading to bond futures prices in the 50s. A graph of the logarithm of the 30-year bond yield in relation to the 8% coupon indicates just how significant and prolonged the deviations from that benchmark have been.



Was there ever a move afoot during the years of double-digit interest rates to benchmark the bond future to a higher level? Not in the public record. Why then has the Chicago Board of Trade decided to change the coupon from 8% to 6% starting with the March 2000 contract? The answer, in a nutshell, is competition. The growth and indeed dominance of the credit derivative market, and the advent of electronic trading, including the presence of a competing 6% contract on the rival Cantor Fitzgerald system have forced the CBOT into doing everything it can to protect its flagship contract.

Ever since the introduction of bond options in 1988, the bond future has seen a general trend of increasing volume for a given level of implied volatility. This trend accelerated during the strong bond market of 1996-1998, and then broke abruptly at the market's peak in the fall of 1998. Interestingly, volatility-adjusted volume has continued to fall throughout 1999.

Volume Traded Per Percentage Point Of Implied Volatility
21-Day Rolling Average



Volatility, up to a point, creates demand for insurance, which should translate into trading volume. Of course, if volatility gets too extreme, traders abandon the market; this backwards-bending demand curve for insurance has been seen in the electricity market (see "Lightning In A Bottle," *Futures*, July 1998). The lower volatility-adjusted volume levels in 1999 do not reflect this phenomenon, for 1999 has been a fairly ordinary year by interest rate standards. Nor can we blame any shortcomings on the part of the CBOT; indeed, anecdotal evidence from the market disruptions of both 1997 and 1998 suggests open-outcry still retains advantages over electronic trading when markets get violent.

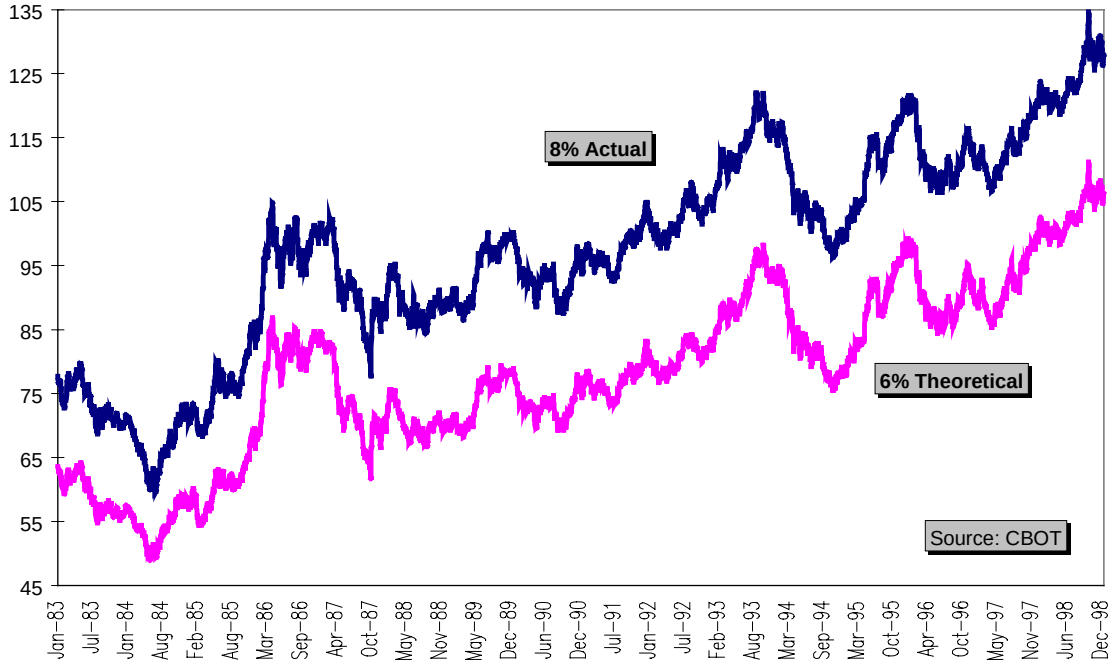
The CBOT's response to what is most likely an evolution of risk management demands from plain-vanilla products like bond futures to customized derivatives has been to change the coupon on the bonds, to start trading 10-year note futures in 64^{th}s, to change the delivery window on 5-year notes, and to start trading serial options on bond futures at earlier dates. Since the first change on any established product is the most difficult to make, we now have a lower threshold for subsequent contract changes. It behooves us, therefore, to understand the behavior of the new 6% coupon contract.

Ticks At Six…

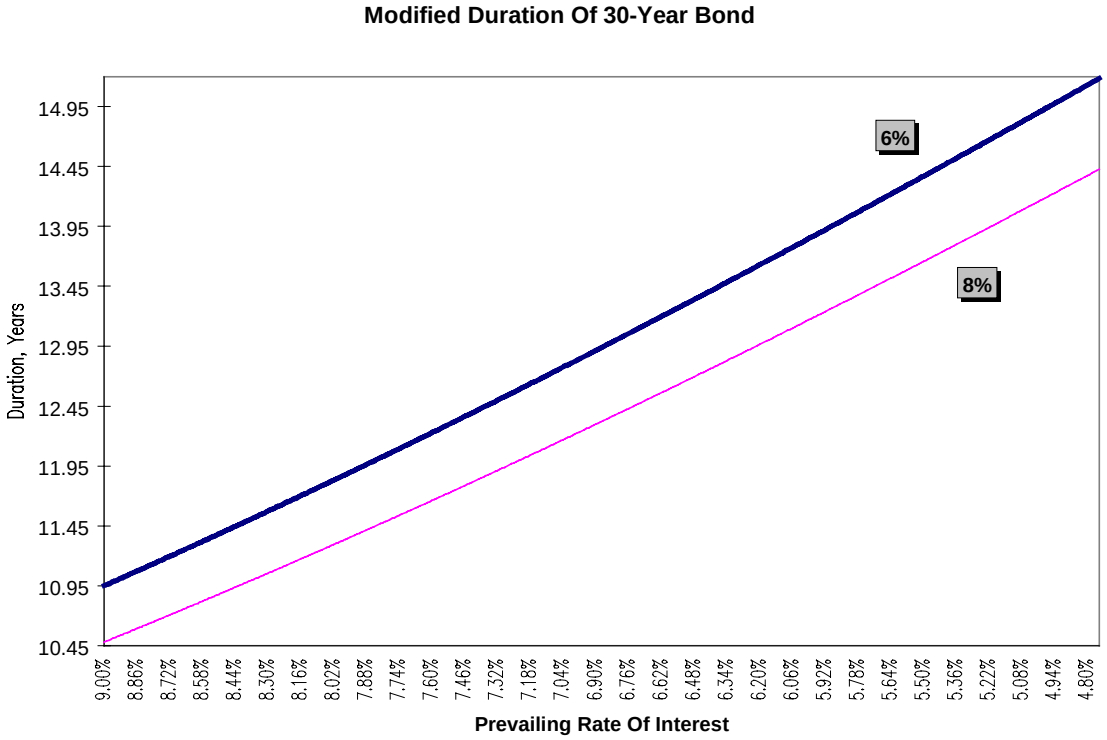
The first and most obvious effect of the 6% coupon will be to increase the conversion factors: Simply replace the 1.04 divisor in the formula with 1.03, and you will see the resulting fraction is larger. Since many bond hedgers base their hedge ratios off of the conversion factors, this will require the use of more bond futures to hedge an identical portfolio. In addition to the higher conversion factors, the greater number of on-the-run bonds near the 6% coupon will lead to more frequent changes in the cheapest-to-deliver issue.

Another quick and obvious effect will be jarring visually to many, and that is the lower price at which the 6% coupon contract will trade. We have become acclimated to bond futures trading at a premium – an 8% bond in a 6% world will always be priced over par – and the resulting drop toward par prices will render familiar technical support and resistance levels obsolete, not to mention the long-term contract continuation charts so near and dear to us all. A reconstruction of nearby bond future prices at the 6% coupon is provided below.

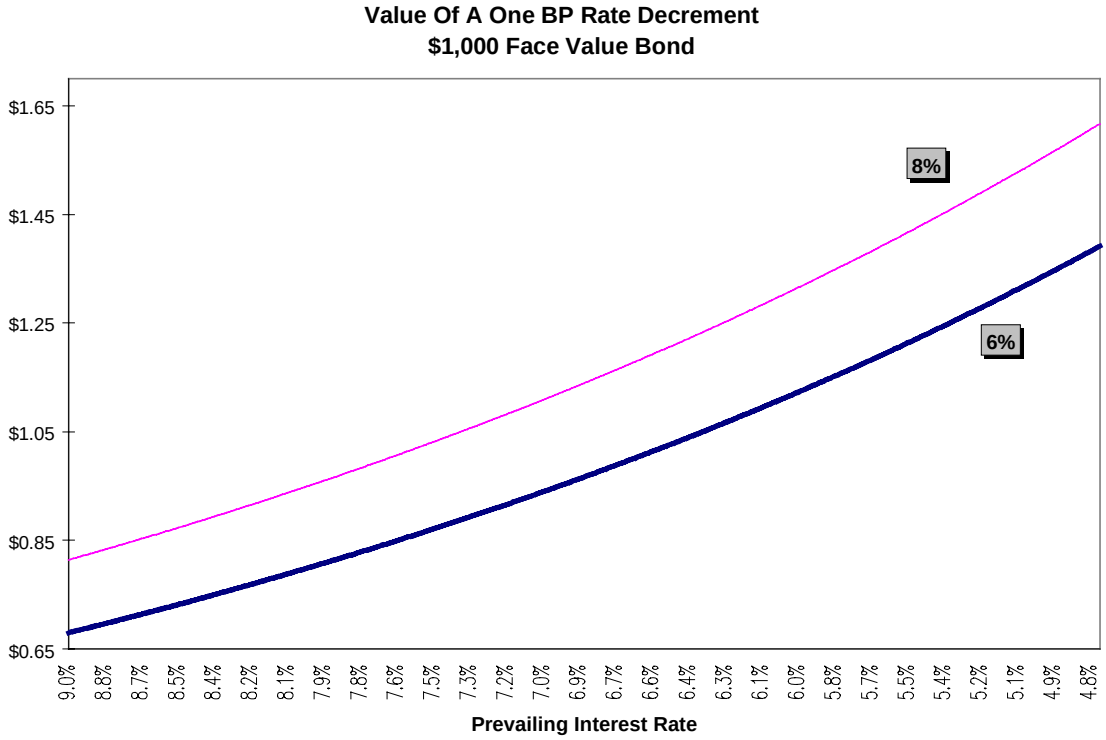
Future Shock:
Updating Your Historical Data



Lower coupon bonds experience a greater percentage price change for a given change in interest rates; the most volatile bonds of all are zero-coupon issues. As the coupon on a bond falls, its duration increases to the limit of the bond's maturity in the case of a zero-coupon. The 6% coupon future thus will track bonds of longer duration. These issues will have greater dollar price volatility, which should raise both the actual volatility of the futures and especially of the bond options. Over the 1983-1998 period, the standard deviation of daily returns for the theoretical 6% coupon future was .6756%, as opposed to .6746% for the actual 8% bond future. While this may not sound like a large difference at first, it is a 1.2585% increase in volatility for a contract whose average implied volatility since the advent of bond options is only 10.088% -- a jump in volatility of close to 12.5%.



Offsetting this greater duration somewhat is the lower value of a basis point (.01%) change in prevailing interest rates; while the percentage price change for the 6% coupon future is greater for each basis point move, its dollar value change will be less than that of the 8% coupon future. Compounding this confusion one more step, exponential behavior of the bond discounting factor e^{-rt} , where *r* and *t* are rate and time, respectively, means the dollar price increase for a given bond for any given fall in interest rates will exceed the dollar price decrease for an identical basis point increase in interest rates.



…Instead of Dinner At Eight

Normally, intermonth spreads in bond futures are devoid of information, but the transitional period between the last 8% coupon contract, the December 1999, and the 6% coupon March 2000 contract will create some interesting spreading opportunities. In a rising interest rate environment, you always want to be short the lower coupon bond and long the higher coupon – short March and long December – and the opposite for a falling interest rate environment, where you would want to be long March and short December.

The acceptance of the contract change will be interesting to observe. The split in the S&P 500 futures contract from a $500 to a $250 multiplier (see "The People's Stock Index Futures," *Futures*, March 1998) did not increase the usage of the "big" contract by institutional hedgers; instead, demand has shifted toward the highly-successful, electronically traded, "E-mini" contract. The 6% bond future should increase demand by hedgers, whoever they are, given the higher conversion factors, but it should – and won't – reduce demand, for reasons of money management, by large speculators now confronted with a more volatile instrument.

The effects of the contract change on the longer-term viability of exchange-traded bond futures might be minuscule: Large and sophisticated players will still create their exotic derivatives, but they will still need the liquid, visible, and well-understood bond future to operate. After all, isn't one of those thirty-one flavors always vanilla?