



AKROS CAPITAL, LLC

Bond Vigilantes Show Signs of Life

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"I used to think that if there was reincarnation, I wanted to come back as the president or the pope or as a .400 baseball hitter. But now I would like to come back as the bond market. You can intimidate everybody."

– James Carville, Political Advisor to President Bill Clinton

In October 1993 concern about the federal budget deficit began to escalate in response to the Clinton administration's perceived lack of commitment to fiscal discipline. Yields on 10-year Treasury notes rose from a low of 5.19% that month to 8.02% in November of the following year. The clear signal sent by the bond market pressured policy makers to adopt stronger deficit-reduction measures. By October 1998 the deficit had become a surplus (at least by government-accounting standards), and 10-year Treasury yields had fallen to 4.15%.

The graph below shows the 10-year U.S. Treasury yield during 2009. The sharp .65% increase over the past several weeks is but a faint echo of the surge during the early Clinton years. Yet, the similarities are just enough to suggest the bond vigilantes, who had driven up rates during the first half of the year, may again be saddling up.



Chart courtesy of StockCharts.com

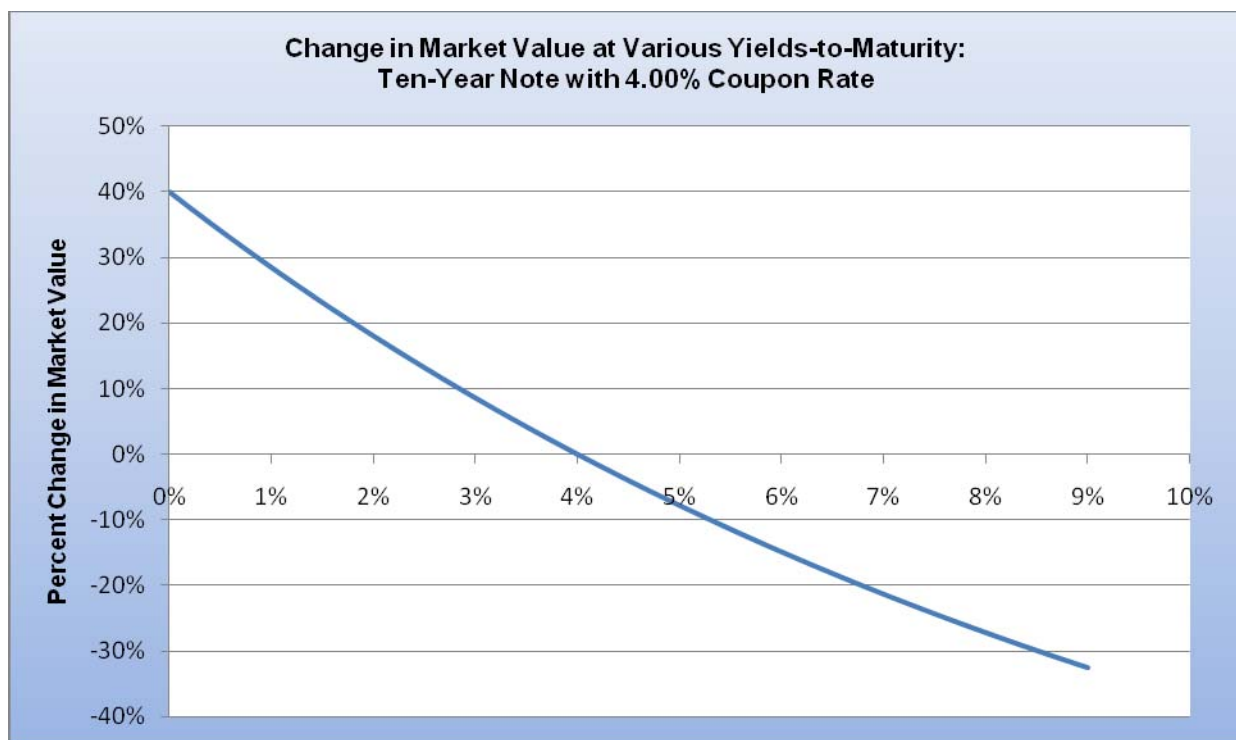
Certainly there is no shortage of reasons to suspect long-term interest rates may be headed higher. Federal spending on bailouts, stimulus programs, jobless benefits and the military is skyrocketing while a recession-induced decline in tax receipts has caused revenues to plummet. Higher interest rates may be required to attract the capital necessary to absorb the Treasury's growing supply of new debt issuance. Because bond prices move inversely to yields, investors are becoming increasingly uneasy about bond valuations.

Meanwhile, the same long-term funding shortfalls that afflicted the Clinton administration with respect to Medicare and Social Security remain present today. Washington's lack of progress in addressing its deteriorating fiscal situation has triggered heightened concern over the sovereign credit risk of the U.S. government and has contributed to upward pressures on Treasury yields.

Bond Mutual Funds See Massive Inflows

In response to miniscule yields offered by money-market funds, mutual-fund investors poured over \$380 billion into bond funds during 2009 according to estimates from the Investment Company Institute. However, the hunt for yield does not come without significant risk.

The graph below shows the percentage change in the market value of a hypothetical 10-year, 4% semi-annual coupon bond as a function of the market yield-to-maturity applied to the bond. Here the inverse relationship between price and yield is readily apparent. Note that the graph crosses the horizontal axis at 4%, which we assume for simplicity in this and subsequent examples to be both the initial yield-to-maturity as well as the coupon rate. The resulting initial market value is simply the bond's face value, assumed to be \$1,000.



The graph reveals that if the market yield for the bond were to rise to 5%, its market price would fall by 7.79% to \$922.05. In this case investors would be demanding a higher yield-to-maturity for the bond in order to compensate for a perceived increase in risk. The \$77.95 decline in market value represents nearly two full years of interest, which at 4% on \$1,000 is equal to \$40 per year. On the other hand, a drop in the bond's market yield to 3% would result in a market-value increase of 8.58% and a price of \$1,085.84.

For longer-term bonds the swings in market value would be even larger, while for bonds of lesser maturity the market price would remain more stable in response to a given change in yield. A bond's sensitivity to interest-rate fluctuations is frequently associated with a concept known as "duration."

Duration

It is often incorrectly stated that a bond's duration represents its percentage change in market value in response to a 1% change in yield-to-maturity. The preceding example demonstrates this cannot be true because the market-value impact clearly depends upon the direction of the 1% change: 7.79% for a 1% increase in yield vs. 8.58% for a 1% decrease. In addition, the appropriate measure for interest-rate sensitivity is not "duration," but rather "modified duration."

Modified duration approximates the *rate of relative change* in a bond's market value for very small changes in its yield-to-maturity, and this relationship becomes exact as the changes in yield become vanishingly small. This is just another way of saying modified duration is the slope of the curve in the preceding graph at the point where it crosses the horizontal axis. (Actually, it is the absolute value of the slope because duration is by definition a positive quantity.)

These ideas are illustrated in the following table, which shows market-value changes, durations and modified durations for 4% semi-annual coupon bonds of five, 10 and 30-year maturities. In each case the original market price is again assumed to be equal to the face value of \$1,000.

	Five-Year Note		10-Year Note		30-Year Bond	
	New Price	Percent Change	New Price	Percent Change	New Price	Percent Change
Yield falls 1%	\$1,046.11	4.6111	\$1,085.84	8.5843	\$1,196.90	19.690
Yield rises 1%	\$956.24	-4.3760	\$922.05	-7.7946	\$845.46	-15.454
Difference / 2		4.494		8.189		17.57
Yield falls .05%	\$1,002.25	0.22486	\$1,004.10	0.40977	\$1,008.74	0.87431
Yield rises .05%	\$997.76	-0.22427	\$995.92	-0.40780	\$991.36	-0.86379
Difference x 10		4.491		8.176		17.38
Duration		4.581		8.339		17.73
Modified Duration		4.491		8.176		17.38

The two middle columns of data in the table correspond to our original example of a 10-year note. In the first two rows the points (3%, 8.5843%) and (5%, -7.7946%) on the market-value curve are used to estimate the slope at (4%, 0%). Dividing the “rise” of: $8.5843\% - (-7.7946\%)$ by the “run” of $5\% - 3\% = 2\%$ produces 8.189, which is fairly close to the exact modified duration of 8.176 shown in the last line of the table. The three middle rows in the table apply the same method using very small (.05%) changes in yield-to-maturity. For the 10-year note the points (3.95%, 0.40977%) and (4.05%, -0.40780%) produce an estimate of 8.176, which is exact to four significant figures. For the five-year and 30-year bonds the respective estimates of 4.491 and 17.38 also are seen to be accurate to four significant figures.

The upshot is modified duration provides a useful measure of interest-rate sensitivity in response to small changes in market yield. Specifically, in the examples above we can see the 10-year note is less than half as volatile as the 30-year bond ($8.176 / 17.38 = .470$), while the five-year note is slightly more than one-quarter as volatile ($4.491 / 17.38 = .258$). When investing in bonds such risk relationships should be carefully considered in addition to yield.

vig i lan te

–noun

1. a member of a vigilance committee.
 2. any person who takes the law into his or her own hands, as by avenging a crime.
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During the nineteenth century vigilance committees kept informal rough order on the frontier or in other places where official authority was imperfect. In the present context the Federal Reserve has authority over monetary policy, while fiscal policy is under the control of Congress. When policy in either or both areas is too loose, fixed-income investments can suffer through inflation, which erodes the future value of payments and principal. In addition, excessive government borrowing can increase the likelihood of default.

If bond investors believe government policymakers are abusing their authority, they may decide to take matters into their own hands and push up interest rates by selling bonds or by cutting back on future purchases of Treasury debt. Should that occur, investors flocking to bonds and bond mutual funds in pursuit of yield may be in for a bumpy ride.

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