

The Fed Valuation Model

The Fed Valuation Model is a simple method to sort out relative valuations between the bond versus stock markets. It is acknowledged to be one of the Federal Reserve's favorite tools to measure investor sentiment. This addendum explores the basics of its theory and practice.

The Fed Model inherently assumes there is a “guns or butter” type of trade-off between owning stocks versus owning bonds. It assumes the relative attraction of one over the other, and therefore the relative valuation of one over the other, is ultimately rooted in certain fundamentals (stock prices, corporate earnings, corporate earnings growth, bond yields). The model also embraces the view that other important factors, including qualitative and “emotional” ones, can temporarily account for the attraction of one investment over the other.

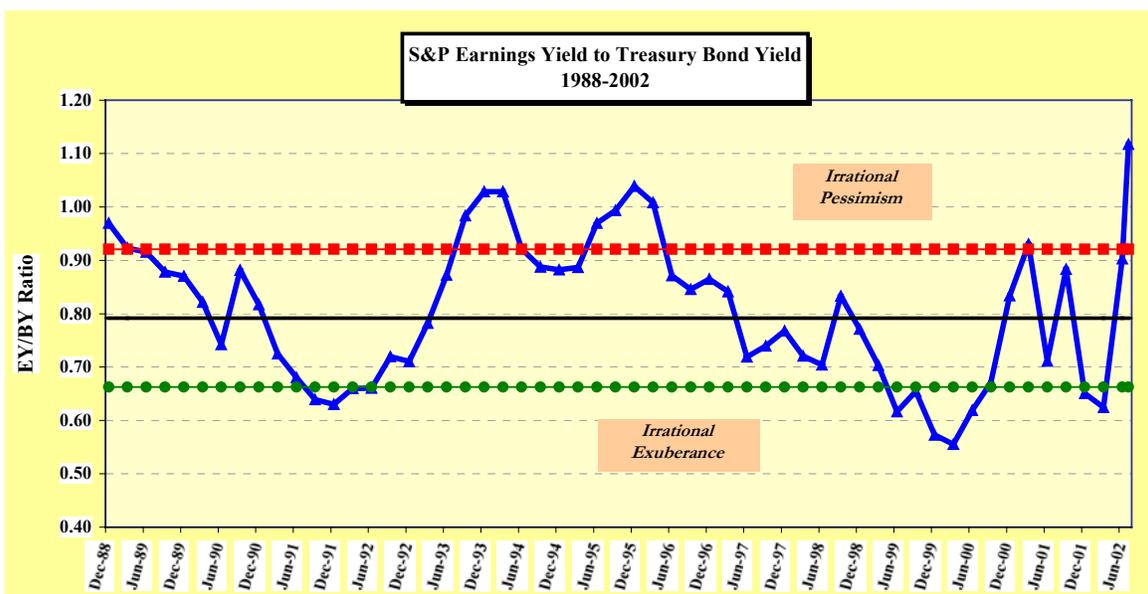
Said another way, the model assumes the fundamental elements of prices, cashflow, earnings, and earnings growth determine a “central tendency” in the relationship between equity and bond valuations, but this tendency is sort of a mean, or median relationship. The simple math doesn't always hold true, because there are many peripheral elements driving relative valuations in addition to the primary ones.

MECHANICS

1. Observe the current estimated long-term return from investing in bonds. From a no credit risk perspective, the best estimator is the current yield-to-maturity of the long-term Treasury Bond. We use the 10-year Treasury's YTM. Call this percentage our Bond Yield, or **BY** (It was **4.50%** on 7/15/02);
2. Observe the current value of, i.e. cost to purchase, the S&P 500 index. (On 7/22/02 it was 819.8);
 - a. Observe the current “earnings per share” of the S&P 500 (actually, the weighted earnings per share of all the companies making up the index). We start our analysis by considering what has already been achieved, because we can easily then observe historical trends. Using reduced analyst estimates for earnings in this year's 2nd quarter (we reduced them by 10%, just on principle), the most recent 12 month's operating earnings of the S&P 500 was a depressed \$41.23. By comparison, trailing operating earnings for the 12 months ended June 1997 were \$42.60;
 - b. Calculate the amount of current corporate earnings you'll be getting an implicit claim on if you bought the index today. This would be $\$41.23 / 820 = 5.03\%$. This is called the Earnings Yield, or **EY**. (*it happens to be the inverse of the P/E ratio*);
3. Divide the current **Earnings Yield** by the current **Bond Yield**. Do this for every previous quarter-end you have data for. Graph the results. The numbers vary within a band, with a central tendency (or mean) of 0.79. Today's EY/BY would be 1.12;



4. Calculate the long-term volatility of the ratio - its standard deviation. Determine the ratio's "band of normalcy", by adding and subtracting one standard deviation from the mean. This band is 0.92 – 0.66. Note the market has been unable to sustain a EY/BY ratio outside this range for very long, regardless of interest rate changes, earnings shifts, or P/E levels.
5. Analyze the movement in this ratio in the context of actual market developments. Has it always shifted in value for the same reason (e.g., realized earnings changes), or is it more complex than that (it is)? Develop an independent forward-looking estimate of bond yields and earnings. What do these imply for future equity returns if investor emotion keeps the ratio high/low, or drives it toward the mean?



ANALYSIS

A Treasury bond's long-term yield-to-maturity (BY) has very few variables associated with it. It is not much of a stretch for an investor to consider it her expected ROI. It is a "safe" return in all respects. This is not the case with a stock's earnings yield (EY). On the negative side, you don't know what the company will do with the earnings – dividend them out, reinvest them successfully in the company's growth, use them for spurious loans to dishonest corporate executives, etc.

On the positive side, if/when corporate earnings grow, stockholders will ultimately derive a direct and increasing benefit not available to bondholders. It is this ability to benefit from *growing* returns that makes stocks fundamentally attractive for a long-term investor. The more earnings growth perceived to be out there, the more attractive today's stock(s) are.

When earnings growth expectations are very high, the relative attractiveness of stocks versus bonds increases, and you'll accept less *current* earnings yield compared to bond yield. The EY/BY ratio is poised to decline below its normal range. It will, as stocks are bid up versus

bonds, unless realized earnings growth is fast enough to deliver on the high equity expectations. Then, as was the case in 1996-98, the ratio stays in its normal range even as the equity markets soar (it also helped that interest rates declined).

Ultimately, growth expectations reach a point where corporate earnings can't deliver on them. Stock prices are bid up faster than earnings rise (you've heard of a market that is increasingly "priced for perfection") and the EY/BY ratio drops below its normal range, even if bond yields have dropped. This can be a period like 1999-2000, where earnings were rising sharply but expectations were rising even faster. Or it can be a period like 1991, where the market began anticipating an earnings recovery (growth) that didn't materialize for some time.

Unrewarded "animal spirits" (Keynes' term) or irrational exuberance (Greenspan's term) is eventually unsettling for investors, and the high relative attraction of stocks versus bonds begins slipping. The EY/BY ratio begins to rise. This can occur even as corporate earnings growth is finally coming on strong (like in 1993-94), or if the market expects a drop in bond yields will be quickly reversed (1995-96). In these two cases, equity markets became cheap because they had gained less than they fundamentally "deserved" to based on earnings growth and interest rates. This period represented the buying opportunity of a generation.

On the other hand, the high EY/BY ratio on March 2001 represented an insidious value trap. Market values had fallen very sharply from a wildly overvalued state 12 months earlier, even though bond yields were dropping. The kicker was forward-looking earnings (2001), which were poised to produce the greatest one-year percentage decline since the 1930's. That is, stock prices had fallen more than trailing earnings, but not nearly enough to compensate for the earnings decline to come.

Where does that leave us today?

1. The EY/BY ratio is at its most favorable level in 15 years, with investor psychology and corporate earnings at depressed levels. If earnings growth materializes in moderate proportions, we could enjoy a period of stock market performance approaching that of 1996-98;
2. Earnings are expected to rise as we come out of this mild GDP recession and major profits recession. A period like 1991 could develop, where earnings growth is slower than expected. Except, in 1991 the market became overpriced as it waited for earnings growth to materialize. Today's market has become incredibly cheap. Worst case, you're being compensated for the risk of having to wait "too long";
3. Alternately, the very high EY/BY ratio could be another value trap like early 2001. Except, earnings growth is expected to be positive over the next two years, not the most negative since the depression. In effect, current sellers are betting on a significant double-dip recession and profits decline, not just a slow recovery.

CHARTWELL CONSULTING