

Why Equity Investors Should Worry Less about the Fed

While the news hardly came as a surprise, US equity investors breathed a sigh of relief over the Federal Reserve's (Fed's) decision to hold off on raising its baseline interest rate at its September meeting – and began anxiously turning their eyes to December. After the selloff sparked by last December's 25 bps hike, some fear a less accommodative Fed could soon be the proverbial straw that breaks the back of a market currently trading at a trailing Price to Earnings Ratio (P/E) of about 20 times earnings. This concern stems in large part from established theories that interest rates and P/E are negatively correlated – with low interest rates historically accompanied by high P/Es, and vice versa. However, at QMA, we have long suspected the relationship was more complicated than that. Recently, we conducted a study examining the past 150 years of data on P/Es and rates. Our findings suggest investors have less reason to worry about the impact of a December rate hike than they might think. In fact, we argue they should be more worried if the Fed finds itself *unable* to raise rates.

Investment Implications

- Contrary to popular belief, low rates, per se, don't support higher valuations. And conversely, even though P/Es are currently a bit high, a hike in rates itself might not cause a drop in valuation.
- In fact, *very* low rates like we've seen these past few years anticipate a couple years of sluggish earnings growth. The good news is, considering US earnings have been negative for five consecutive quarters¹, we could be about to come out the other end of that tunnel. Together with nascent evidence the US economy is growing steadily and the dollar and oil prices are stabilizing, this could point to an uptick in earnings in Q4 and early 2017.
- As long as the Fed raises on the back of improving economic conditions and rising profits, it should offer support and, in a way, justify the current levels of equity valuations, and could even cause them to rise further. We believe the bottom line is: Don't worry about the Fed; focus on growth.

¹ Factset, as of 10/21/2016.

What the "Fed Model" Says

Are US stock prices too high? Interest rates too low? Ask 20 investors and you may hear 20 different answers. But one consensus you are likely to hear is that it is difficult to have one without the other.

This relationship is known as the "Fed Model,"² and it states that because stocks and bonds are asset classes competing for the same capital, earnings yields (Earnings to Price, E/P) should stay roughly in equilibrium with long-term bond yields. Until now, this notion has contributed to a certain sanguinity around today's low earnings yields (and high P/Es). After all, as of September 30th, \$11.6 trillion in bonds around the globe were trading at negative rates³. Treasury bonds in the US have reached record low levels, and real rates are hovering around zero in most of the developed world. Based on the Fed model, these exceptionally low yields have a direct effect on valuation of equities, justifying low earnings yields and, conversely, elevated P/Es.

A (slightly) more technical way of understanding this is in terms of discounted cash flows. Investment theory postulates that the value of an asset is the present, or discounted, value of its future cash flows. We can think of the expected returns of equities as a function of future cash flows to investors, either as earnings or dividends, divided by a discount rate. All else being equal, lower discount rates should thus translate into higher present value of future cash flows—or higher P/E. By the same token, if the discount rate rises (again, all else being equal), present value of cash flows and P/Es should fall. At a basic arithmetic level, this helps explain why so many investors are approaching an expected Fed rate hike this December with so much trepidation. According to the Fed Model, if interest rates go up, then P/E ratios must come down.

But Is This Right?

To answer this question, we analyzed the past 150 years of interest rates and one-year trailing P/Es, using data compiled by Yale University professor Robert Shiller. Surprisingly, the widely popular Fed Model provides only a limited view of a much more complex picture. Figure 1 on the next page plots the inverse of P/E (or earnings yields) so we can eyeball the relationship with rates more easily. For the 90 years starting in 1871, there was little (-5%) correlation between the valuation of stocks and bonds. Equity valuations swung widely at various points, while interest rates were generally quite steady. In the 1960s and 1970s, however, interest rates rose sharply, and equity valuations dropped—that is, E/P rose and P/E fell. In the 1980s and 1990s rates and E/Ps both

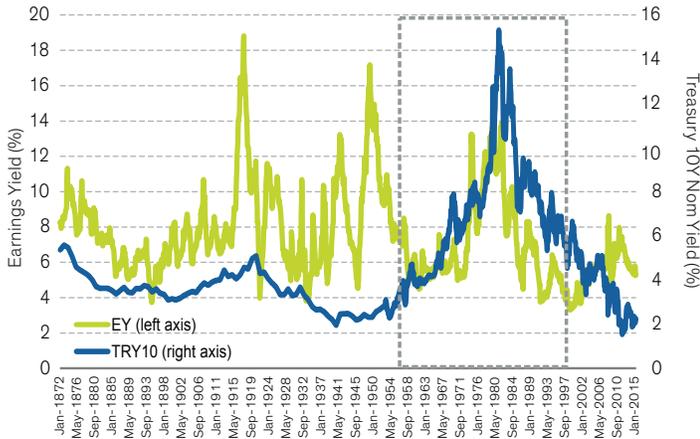
² The term "Fed Model" is based on "Earnings Forecasts and the Predictability of Stock Returns: Evidence from Trading the S&P," a 1997 paper by Fed Governors Joel Lander, Athanasios Orphanides and Martha Douvogiannis, and was popularized by then-Deutsche Bank Chief Economist Ed Yardeni.

³ "Negative-Yielding Bonds Jump to Almost \$12 Trillion," Bloomberg, October 2, 2016.

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fell. Overall, for these four decades (the boxed period in the chart) E/P and interest rates were very highly (70%) correlated. This encompassed the backtest period that researchers at the Fed used to create what became known as the Fed Model. In their sample, the relationship between equity valuations and interest rates held quite well, but in our new millennium that relationship has become much more unstable and reversed to -70% since 2000 overall.

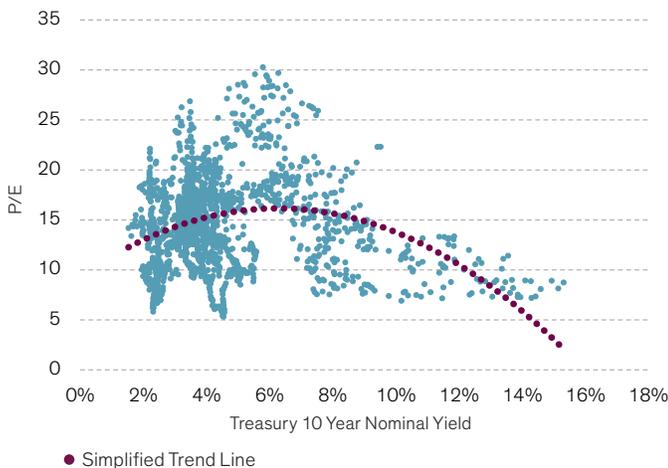
1/ US TREASURY NOMINAL 10-YEAR YIELD vs S&P 500 EARNINGS YIELD (1872-2015)



Source: Shiller, Bloomberg, QMA.

The trillion-dollar question is whether the recent weakening of the classic paradigm is a permanent shift or just the result of a confluence of circumstances unlikely to continue much farther into the future. To find out, we conducted a simple data analysis breaking out every average monthly P/E irrespective of when it occurred and mapped it to the level of interest rates at the time. Figures 2 and 3 summarize the distribution of P/Es at different levels of nominal and real rates. Breaking them out this way, we see that the relationship between rates and P/Es is captured by an approximate bell curve. P/Es are at their highest when rates are in what might be considered a “normal” range, and become depressed when rates are either very high or very low.

2/ US TREASURY NOMINAL 10 YEAR YIELD vs S&P 500 P/E (1872-2015), ACTUAL AND AVERAGE



Source: Shiller, Bloomberg, QMA.

3/ US TREASURY REAL 10 YEAR YIELD vs S&P 500 P/E (1872-2015), ACTUAL AND AVERAGE



Source: Shiller, Bloomberg, QMA.

So, What’s Really Going On?

The question now is whether our empirical observations have any theoretical and practical basis. We start by noting that bond yields vs. earnings yields is really a false comparison. While bonds are an asset with fixed nominal cash flows, equities are expected to deliver cash flows that grow over time. The simplified⁴ formulas below capture this key distinction:

$$Present\ Value\ of\ Bonds = \frac{Cash\ Flows}{Interest\ Rate}$$

$$Present\ Value\ of\ Equities = \frac{Cash\ Flows}{(Interest\ Rate + Risk\ Premium - Growth\ Rate)}$$

Built into earnings yields are important assumptions about risk and the future growth of earnings. Interest rates are the markets’ way of pricing this risk and forecasting future earnings growth as a function of the cost of capital. When interest rates are rising, they imply a strong demand for capital and faster subsequent growth. When they are falling (or being lowered), they indicate a weaker demand, but eventually the lower borrowing costs should stimulate business investment and lead to higher growth.

But when interest rates are very low for a very long time, we believe that investors might infer that growth rates could be abnormally low for an extended period. In our formula above for the present value of equities, a drop in expected growth that is greater than the drop in interest rates would actually reduce equity valuations despite the low rate. In addition, investors worried about the slow growth might demand a higher risk premium to hold stocks. So, under certain circumstances, like, say, the ones we face today, low rates could eventually hurt equity valuations, reducing them to below what they otherwise would be.

⁴ For both equations, we assume cash flows are in perpetuity.

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To test this hypothesis, we went back to the data and plotted three consecutive years of earnings growth for each starting level of real rates (Figure 4). We can see that the very lowest levels of real rates foretell two succeeding years of negative earnings growth, after which the effect does begin to dissipate: More evidence that the economy's various pricers of capital perceive low rates as a harbinger of poor growth.

4/ US TREASURY 10 YEAR REAL RATES vs SUBSEQUENT EPS GROWTH (1872-2015)



Source: Shiller, Bloomberg, QMA.

Authors

Irene Tunkel, Principal and Senior Quantitative Analyst
Ed Keon, Managing Director and Portfolio Manager
QMA's Asset Allocation Investment Team

For more information

To learn more about QMA's capabilities, please contact Stephen Brundage, Managing Director and Portfolio Strategist, at Stephen.Brundage@qmassociates.com or 973.367.4591

Conclusion

In real life, "all else being equal" does not quite hold. The value of equities is a function of discounted cash flows *adjusted for future growth*. Hence, while we may be excited about discounting cash flows at lower rates, we must not forget that if growth fails to materialize, cash flows will be smaller, too. What's more, the discount rate and expected earnings growth rates are not independent. Lower interest rates also imply lower growth, potentially reducing the present value of the future cash flows and making equities inherently less attractive to investors. Beyond a certain point, this causes them to require additional compensation for holding equities—i.e., a higher equity risk premium—pushing down valuations and widening the gap between earnings yield and bond yield, depressing P/E.

That's why at QMA, while we are keeping one eye on the Fed, we are keeping another trained even more squarely on growth. As our study has suggested, we believe an increased Fed rate is no reason for investors to panic. Quite contrary, assuming growth materializes to justify an interest hike, we worry more what the Fed would be signaling if it *doesn't* raise.

About QMA

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*As of 9/30/2016.

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