Cost of Capital Should Align With the Broad Market Conditions as of the Valuation Date
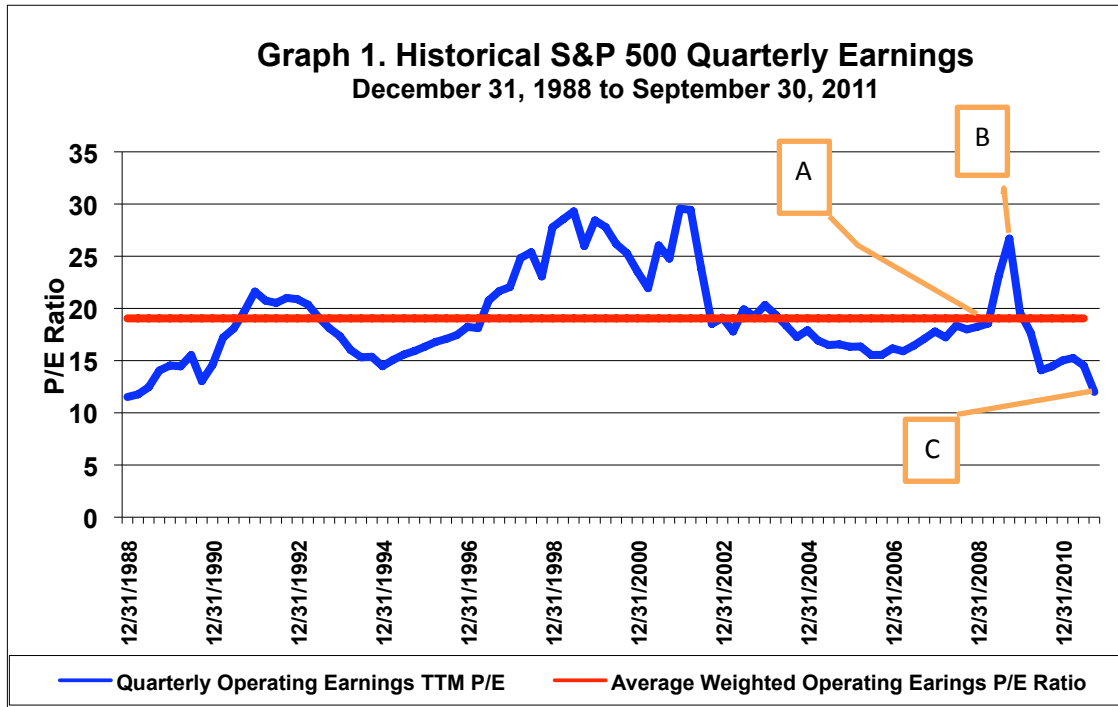
By Marc Vianello, CPA, ABV, CFF

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Editor's note: In the January issue of BVU, Marc Vianello, CPA, ABV, CFF introduced his observations regarding the problems associated with conventional methods of calculating cost of capital under the volatile market conditions. This article presents a methodology for adjusting conventional cost of capital estimates so that they reflect prevailing market conditions.

Fair market value should reflect general economic conditions, be they normal, boom, or depression. Valuation practitioners cannot meet this Revenue Ruling 59-60 requirement using *Ibbotson* and *Duff & Phelps* cost of capital estimates without adjusting for current market conditions. These measures of cost of capital are based on cumulative arithmetic means that can yield equity costs contrary to current market conditions.

Comparing the arithmetic mean returns estimated using the *Ibbotson* and *Duff & Phelps* buildup methods over time discloses a lack of fluctuation in cost of capital despite the dramatically different market conditions that can and do exist. Sometimes, what little fluctuation occurs with these buildup methods is contrary to the movement of the market. For example, as of March 31, 2009, Sept. 30, 2009, and Sept. 30, 2011, the *Ibbotson* buildup method estimates arithmetic mean equity costs of capital for a Decile 1 company of 9.34%, 9.75%, and 8.38%, respectively. Yet Graph 1, which provides a historical perspective of the P/E ratio of the S&P 500, suggests that the market would have valued a dollar of earnings much differently on each of these dates.

Graph 1. Historical S&P 500 Quarterly Earnings
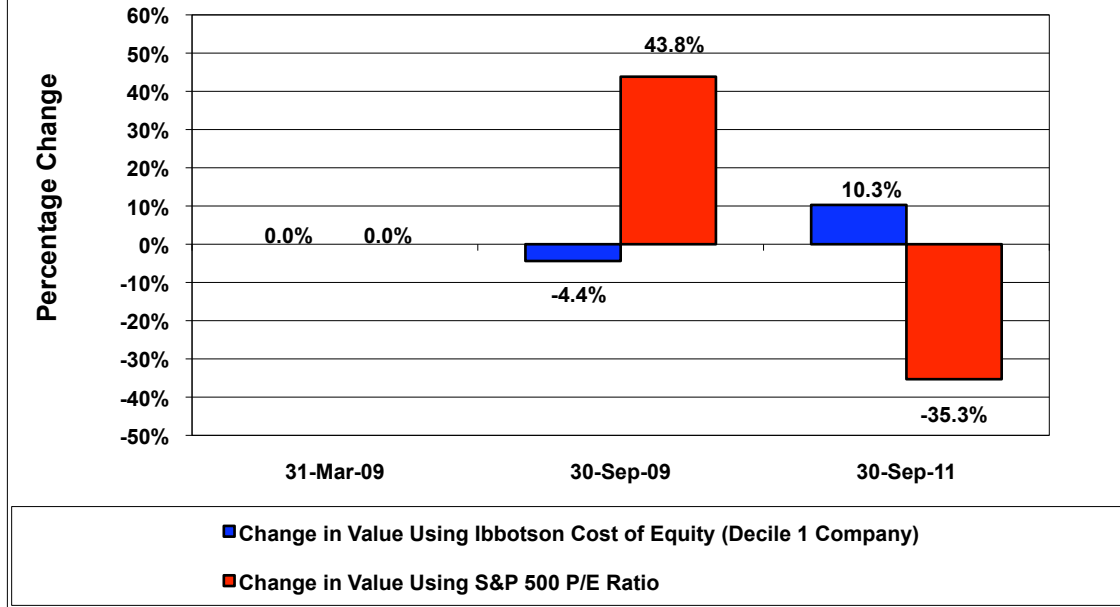December 31, 1988 to September 30, 2011

Based on the trailing 12 months (TTM) of operating earnings, the long-term average P/E ratio of the S&P 500 index from Dec. 31, 1988, to Sept. 30, 2011, was 19:1, which implies a marketable capitalization rate of 5.26% and an average expected growth rate of 3.12% for the overall market based on *Ibbotson*'s long horizon Decile 1 cost of capital of 8.38%.[1] But looking at Sept. 30, 2011, on a discrete TTM basis, the P/E ratio of the S&P 500 was 12:1. This implies a marketable capitalization rate of 8.33%, and a *negative* 0.05% growth rate expectation for the overall market based cost of capital of 8.38%.

Graph 2 compares the change in cost of equity of a hypothetical Decile 1 company at three points in time, and compares the changes to the contemporaneous changes of the S&P 500 TTM P/E ratio. March 31, 2009 (point A on Graph 1), serves as the baseline of the graph and the related discussion.

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[1] Duff & Phelps uses historical averages going back to 1963 (*Duff & Phelps Risk Premium Report 2011,* at page 10). *Ibbotson* uses historical averages going back to 1926 (*2011 Ibbotson SBBI Valuation Yearbook*, page 121). Using P/E ratios of the S&P 500 index going back to 1963 and 1926, if available, might yield a different historical average.

**Graph 2. Conventionally Calculated Costs of Equity May
Be Inconsistent With Market Changes**
Baseline: March 31, 2009

- Change in Value Using Ibbotson Cost of Equity (Decile 1 Company)
- Change in Value Using S&P 500 P/E Ratio

On Sept. 30, 2009 (point B on Graph 1), using the *Ibbotson* buildup method, the arithmetic mean cost of equity estimated for a Decile 1 company was 9.75%, or 4.4% higher than the 9.34% cost as of March 31, 2009 (point A on Graph 1). Assuming all other things to be equal, the equity value of a hypothetical Decile 1 company on Sept. 30, 2009, should have been 4.4% lower relative to the earlier date. However, on March 31, 2009, the market was at about parity with the historical long-term average P/E (18.555 P/E versus 19.045 P/E) while at Sept. 30, 2009 (point B on Graph 1), the P/E ratio of the market was much higher than on the earlier date (26.687 P/E versus 18.555 P/E). Therefore, the market was placing a much higher value on each dollar of operating earnings on Sept. 30, 2009, than on March 31, 2009—about 43.8% more value.

Similarly, with an *Ibbotson* cost of equity capital of 8.38% on Sept. 30, 2011, the value of a dollar of operating earnings for the same hypothetical company should have been worth 10.3% more than on March 31, 2009, all other things assumed to be equal. However, on Sept. 30, 2011 (point C on Graph 1), the P/E of the market was well *below* the P/E as of March 31, 2009 (12.003 P/E versus 18.555 P/E). Therefore, the market considered a dollar of operating earnings to be much *less* valuable on Sept. 30, 2011, than it was on March 31, 2009—about 35.3% less valuable. These contradictions

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demonstrate the need for a market conditions adjustment of the cost of equity estimated using cumulative arithmetic mean methodologies.

Although no method to adjust for prevailing market conditions is likely to be perfect, one objective way to deal with disparate prevailing market conditions is creating an adjustment factor to apply, by multiplication, to the arithmetic means determined using the *Ibbotson* and *Duff & Phelps* buildup methods. Using the S&P 500, practitioners can construct such a factor by dividing the TTM historical average P/E ratio by the TTM P/E ratio as of the valuation date. For example, if the historical P/E ratio through a valuation date is 19x and the recent P/E ratio is 13x then the factor to multiply times the arithmetic mean cost of capital is 1.38. If the conventional *Ibbotson* or *Duff & Phelps* buildup of cost of capital is an arithmetic mean of 10% then adjusting for the described P/E shift in market conditions results in an adjusted mean of 13.8%. This, of course, would drive the market value of the valuation subject down, which is the result that one would expect if P/E ratios have contracted. Conversely, application of the method results in higher values during periods of time when the market is rewarding earnings more than it has historically.

The described approach for adjusting cost of capital is consistent with valuation theory because the inverse of a P/E ratio is a market capitalization rate. As we all know, changes in capitalization rates cause ratable changes in valuation. And capitalization rates are reconcilable to discount rates, so practitioners can use the method in discounted cash flow models. The method also preserves the underlying usefulness of *Ibbotson* and *Duff & Phelps* cost of capital calculations as the baseline from which to adjust cost of capital for current market conditions. Using 12 trailing months provides some smoothing of dramatic single-quarter S&P index and earnings per share anomalies, while being consistent with the way in which many investors analyze historical results of operations.[2]

The proposed cost of capital adjustment works mechanically as follows: When the market is at parity with its historical average P/E, such an adjustment factor would be 1:1, resulting in no net effect on the discount rate. However, when market P/Es are high relative to the historical average (i.e., a "good" market that is rewarding earnings), the adjustment factor would be less than 1:1—the numerator (historical P/E) would be

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[2] Variations on the TTM idea might include annualizing the most recent quarter, weighting the trailing quarters in some manner, or attempting to use expected earnings. Each of these would seem to be more arbitrary than simply using a straight TTM approach. Additionally, using expected S&P 500 quarterly or annual earnings is impractical because of questions such as "Whose expectation?" and the difficulty of constructing a benchmark of long-term average expectations.

less than the denominator (current P/E)—resulting in a reduced cost of capital and a higher appraised value. But when market P/Es are low relative to the historical average (i.e., a "bad" market that does not reward earnings), the adjustment factor would be greater than 1:1—the numerator (historical P/E) would be greater than the denominator (current P/E)—resulting in increased cost of capital and a lower appraised value. The resulting adjusted costs of capital and valuations would better correspond with the public market as of the particular valuation date.

The proposed method allows an objective, date-specific quantification of the value that the market is placing on a dollar of earnings or cash flow relative to historical norms. By doing so, the method captures something not reflected in the stable cumulative returns of *Ibbotson* and *Duff & Phelps*—the general economic conditions that Revenue Ruling 59-60 requires business valuations to reflect.

Marc Vianello, CPA, ABV, CFF, managing member of Vianello Forensic Consulting LLC, can be reached at vianello@vianello.biz.