

FRANK J. GAMBINO, CFA
Chief Equity Strategist & Portfolio Manager

JEREMY R. BAIER, CFA
Senior Equity Analyst & Portfolio Manager

Quantifying the Impacts of Changes in Interest Rates on Equity Valuation

The overall rise in interest rates has captured investors' attention in ways many market actors have not needed to react to in decades. From an equity investor's perspective, for many years, easy money paved the way for a lack of a competitive environment versus its fixed income counterpart. In addition, and as mentioned in our "3q23 Outlook", we remarked on the adverse change in coverage ratios related to the change in interest rates, an abrupt reversal in the relative ease with which even marginal companies were able to service their fixed charge commitments. The impact on equity valuations is less direct and, in this *Isthmus Insights*, we attempt to quantify the valuation aspect of what higher interest rates mean using a certain set of cogent assumptions.

It is somewhat obvious to state that higher interest rates can have an impact on a business's performance. The hurdle rates for projects increase, cash required for debt service is higher and customers might be less willing to spend – the impacts are far reaching and these all need to be considered when assessing a company through our independent research process. Readers will recall that the cornerstones of Isthmus Partners' investment philosophy are quality and valuation. We define quality as the generation of a positive spread between the Return on Invested Capital (ROIC) and the Weighted Average Cost of Capital (WACC). Thus, higher interest rates logically place a higher burden on the generation of ROIC. However, we really wanted to analyze and quantify how higher interest rates affect the second of those two principles - valuation.

Our preferred tool for valuation is a discounted cash flow analysis (DCF). One major input into a DCF model is the Weighted Average Cost of Capital. Using the Capital Asset Pricing Model (CAPM), the WACC can be defined by the following formula:

$$WACC = ((r_f + (\beta * \text{Equity Risk Premium})) * E) + (r_d * (1-t)) * D$$

Where:

- r_f is the risk-free rate, often defined as the yield on a 10-year US Treasury
- β is beta, a measure of systematic risk of a security compared to the market as a whole
- Equity Risk Premium is a risk adjustment factor for equities compared to the risk-free rate
- E is the Equity weight in the capital structure
- r_d is the cost of debt
- t is the tax rate
- D is the Debt weight in the capital structure

Increases in interest rates can impact nearly all aspects of the CAPM formula. As interest rates rise, r_f increases. The beta (a proxy for risk) of highly leveraged companies can increase meaningfully. The cost of debt will rise for most companies. So, what can this mean for valuation? We decided to look at a generic DCF model using cumulative data for the non-financial constituents of the S&P 1500 Index to see what the outcome would look like given changes in the WACC driven by the rise in interest rates since the beginning of the year. The following is a discussion of the results of our analysis.

Main DCF inputs included the cumulative Free Cash Flow (FCF) of the non-financial segment of the S&P 1500 as of the last twelve months. Over the ten-year forecast period we grew that FCF at ~8.25%, approximately the average return for the benchmark over the last twenty years. A terminal growth rate of 4.5% was used and all cash values were discounted back to the present period using the WACC. WACC inputs outside of the risk-free rate were held constant. That is, the Equity Risk Premium was 5.5%; the cost of debt was held at 200 basis points above the 10-year US Treasury rate; the tax rate was 25%; the Debt and Equity weights were calculated using the market value of included equities and the book value of debt for those constituents as of the two periods; and β was set to a value of 1 (so as to match the market as a whole). The main variable input was the risk free rate. For our purposes, the yield of the 10-year US Treasury at the beginning of the year (3.87%) and at the end of the third quarter (4.57%) were used. The following table shows the change in the Weighted Average Cost of Capital under these assumptions between 12/31/2022 and 9/30/2023.

Table 1: Year-to-Date Change in Weighted Average Cost of Capital for the S&P 1500 Index

12/31/2022			9/30/2023	
WACC (beta=1)			WACC (beta=1)	
rf	3.87%	→	rf	4.57%
Risk Premium	5.50%		Risk Premium	5.50%
Pre-tax r_d	5.87%	→	Pre-tax r_d	6.57%
Tax Rate	25.0%		Tax Rate	25.0%
After-tax r_d	4.4%	→	After-tax r_d	4.9%
Equity Weight	83%	→	Equity Weight	81%
Debt Weight	17%	→	Debt Weight	19%
WACC	8.44%	→	WACC	9.20%

Source: FactSet Research Systems Inc.

We see an increase in the WACC to the tune of 76 basis points. When we flow through that assumption into the basic DCF framework, we see a potential reduction in equity value for the constituents of over 19%, all else equal.

We visualize and quantify the impact that changes in WACC can have on a discounted cash flow stream. We also observe the quickness with which the trend can reverse, as we have seen with the recent equity market strength on the heels of the remarkable reduction in the 10-year US Treasury from its 4.57% yield at 9/30/23 to 3.93% at the time of this writing. Nevertheless, we believe that the sensitivity surrounding estimates of enterprise values in connection with changes in interest rates matters not only due to the magnitude of basis point changes in the absolute, but also the percentage change in interest rate movements. That is, coming off a low base, it does not take much movement in basis point changes to have a pivotal impact on valuation (witness the move in the risk-free rate from 12/31/22 to 9/30/23 of 70 basis points, an 18% increase in percentage change terms). Given the still low level of interest rates in absolute terms, we continue to expect that any meaningful directional changes in interest rates will have potentially seismic impacts on valuations. Our work above attempts to quantify these and the speed with which we have seen interest rate movements puts pressure on the equity investor to react to opportunistic windows when presented.