The Weighted Average Cost of Capital (WACC) Approach

A firm's overall WACC is a market value weighted average of the after tax cost of debt and cost of equity:

$$r_{WACC} = B/(B+S_L)*r_B*(1-T_C) + S_L/(B+S_L)*r_S$$

The intuition of the WACC approach is simple and appealing. If a project's expected after tax return is higher than the weighted average of the after tax required returns on debt and equity capital, it is a positive NPV project.

Continuing our previous example, the weighted average cost of capital for a levered firm in the MM world is:

$B/V_L = 0.45$ (given)

$r_B = 10\%$

$r_S = 26.4636\%$

$T_C = 21\%$

$r_{WACC} = .45*.10*(1-.21) + (1-.45)*.264636 = 18.11\%$

The present value of the after tax cash flows to the firm discounted at r_{WACC} is:

$$PV_{WACC} = (\$2,531,646*(1-.21))/.1811 = \$11,043,624$$

and the **NPV_{WACC} = $11,043,624 - $10,000,000 = $1,043,624.**

Again, the after tax operating cash flows for the unlevered firm are forecasted to be the same each year. We value them as a perpetuity.

In summary, the NPVs calculated according to the three approaches are practically the same, with minor discrepancies that are resulted from rounding in the calculations. This example illustrates that APV, FTE and WACC are different but complementary ways of valuing the firm. Each approach accounts for the tax benefits of financial leverage differently but the value of the benefits is the same under each approach in the MM world.

Reference Lecture Slides 12 - 13 and 44 - 45 for additional numerical examples on the WACC approach.