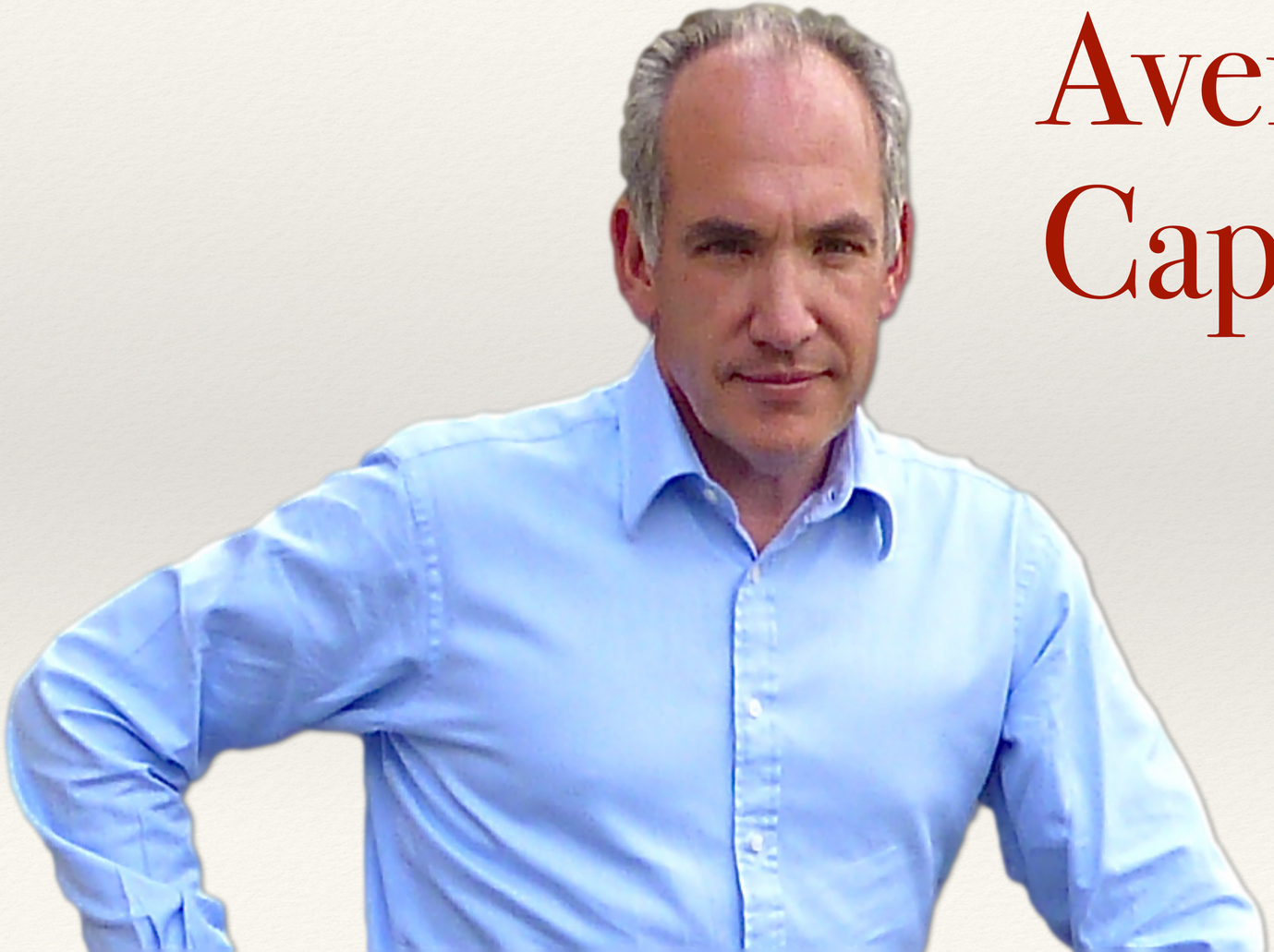
The Weighted Average Cost of Capital Formula



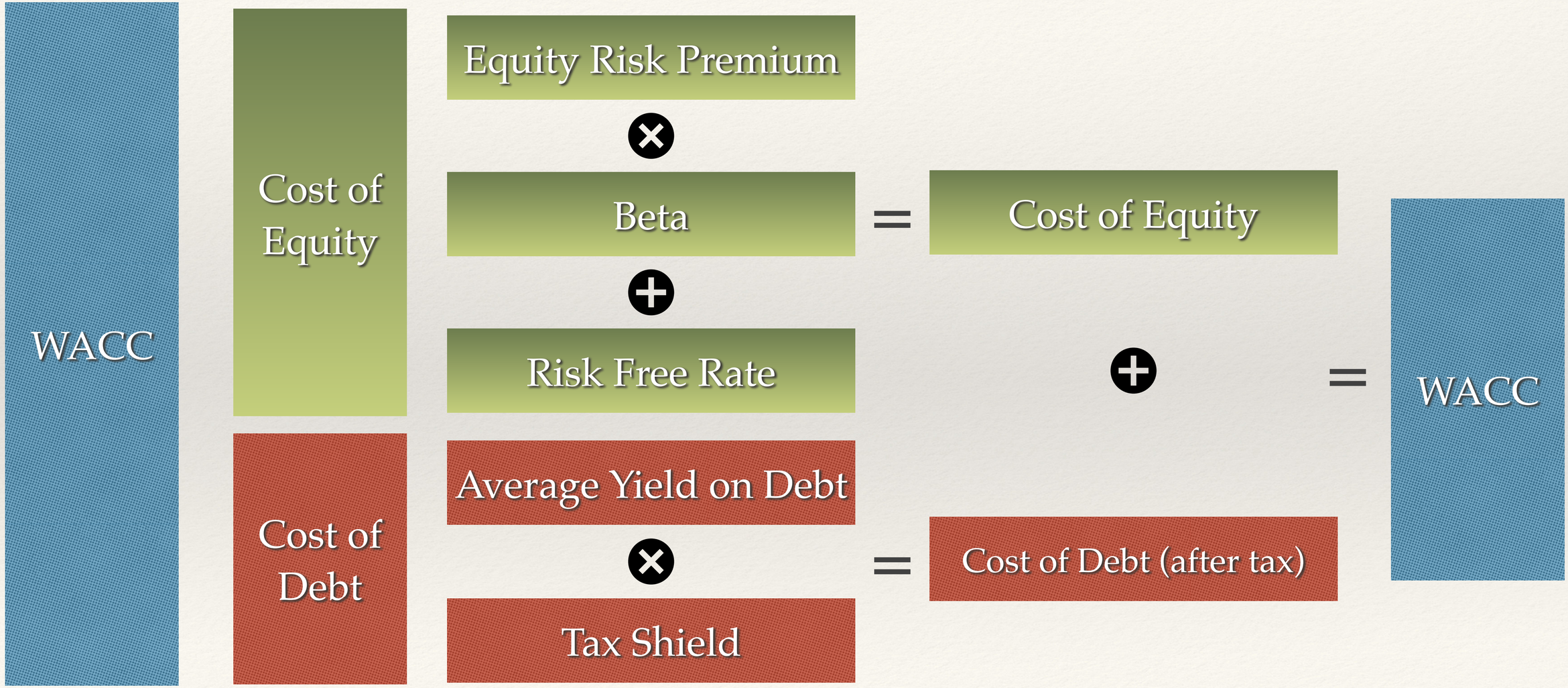
The Weighted Average Cost of Capital Formula

- The Weighted Average Cost of Capital or WACC is the cost of capital for a company which combines the cost of capital across all types of financing.
- This is the Discount Rate we use for our DCF Model

The Weighted Average Cost of Capital Formula

- This can be seen in the following diagram…

The Weighted Average Cost of Capital Formula



The Weighted Average Cost of Capital Formula

- The WACC formula is as follows…

The Weighted Average Cost of Capital Formula

$$WACC = (E/V \times Re) + ((D/V \times Rd) \times (1 - T)$$

WACC = (Cost of Equity x % of Equity)

+ (Cost of Debt % of Debt) x (1-Tax Rate)

The Weighted Average Cost of Capital Formula

- The elements of the formula are…

- E = Market value of Equity (Market Cap)
- D = Market value of Debt
- V = Total Value of Capital (Equity + Debt)
- E/V = % of Equity
- D/V = % of Debt
- Re= Cost of Equity (CAPM)
- Rd = Cost of Debt (YTM)
- T = Tax Rate

The Weighted Average Cost of Capital Formula

- If there are other types of capital in the capital structure such as convertibles or preferred stock their weighted costs should be included in the calculation

The Weighted Average Cost of Capital Formula

- The Cost of Equity is calculated using the CAPM which we did in the previous lecture.

The Weighted Average Cost of Capital Formula

- The Cost of Debt - usually cheaper than equity and so enhancing to returns - is calculated using the interest rate of the debt

The Weighted Average Cost of Capital Formula

- However, because our DCF uses cash flows after tax and interest costs are tax deductible, we can reduce the Cost of Debt by the tax rate

After Tax Cost of Debt =

Cost of Debt x (1 - Tax Rate)

The Weighted Average Cost of Capital Formula

- This is one of the major reasons debt is used in leveraged transactions
- It reduces the cost of capital
- It can be deducted from taxable income
- However excess debt (leverage) increases business risk

After Tax Cost of Debt =

Cost of Debt x (1 - Tax Rate)

The Weighted Average Cost of Capital Formula

- Note that different debt instruments will have different interest costs and each will need to be calculated separately to arrive at the blended cost of debt

After Tax Cost of Debt =

Cost of Debt x (1 - Tax Rate)

The Weighted Average Cost of Capital Formula

- To arrive at the WACC we simply add the Weighted Average Cost of the debt and equity together.

The Weighted Average Cost of Capital Formula

- We now have the discount rate to use in our Discounted Cash Flow model
- This is also the Hurdle Rate with with the company should evaluate investment opportunities.

The Weighted Average Cost of Capital Formula

- One detail to be aware of is the difference between Nominal and Real WACC

The Weighted Average Cost of Capital Formula

- Nominal Free Cash Flows include inflation and should be discounted by a nominal WACC
- This is the most common way to construct your DCF model
- If you use Real Free Cash Flows and exclude inflation you need to adjust your WACC to reflect this.

The Weighted Average Cost of Capital Formula