



WACC Analysis

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What Are DCF And WACC?

A DCF takes a cash flow occurring in the future and calculates how much would be paid for it today.

Imagine investing 100.0 today with a 10.0% return.

Time	0	1	2	3
Cash flow	100.0	110.0	121.0	133.1

$\times (1+10.0\%)$ $\times (1+10.0\%)$ $\times (1+10.0\%)$

But what if it happened in reverse? You are offered 133.1 in 3 years time, and you require a 10.0% return. How much should you pay *now*?

Time	0	1	2	3
Cash flow	100.0	110.0	121.0	133.1

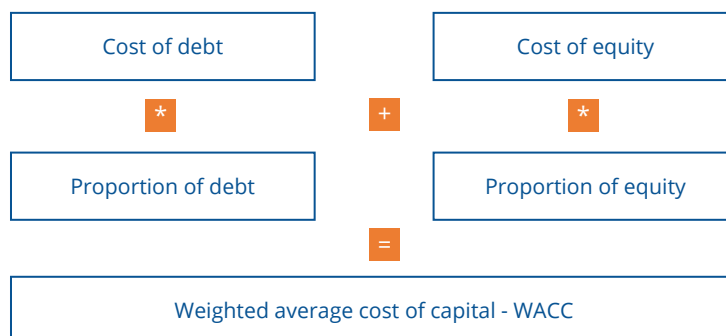
$\div (1+10.0\%)$ $\div (1+10.0\%)$ $\div (1+10.0\%)$

The 100.0 represents the present value of a 133.1 future cash flow.

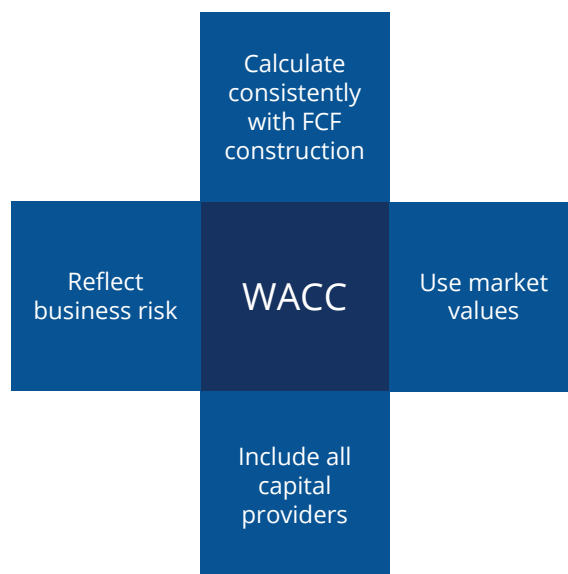
The investor's 10.0% *required return* also represents a *cost of capital* of 10.0% for the company being invested in.

When the company sources cash from a variety of places, a *weighted average cost of capital* (or WACC) is calculated.

Weighted Average Cost of Capital



The valuation is very sensitive to WACC
Cost of net debt and especially cost of equity are difficult to accurately calculate



WACC Formula

$$WACC = K_e * \frac{E}{E + D} + K_d * (1 - \text{tax}) * \frac{D}{E + D}$$

Required return on equity

Market value of equity

Cost of debt

MTR

Market value of debt

Cost of Debt

The financial markets help us price risk - what return do investors expect for investing in company debt?

Ensure your cost of debt reflects the long-term capital structure

Use a current market cost of debt for ten year

Maturity	Yield	S&P Rating
1.0	0.87%	BBB
2.0	1.54%	BBB
3.0	1.60%	BBB
3.0	2.23%	BBB
5.0	2.77%	BBB
7.0	3.63%	BBB
10.0	4.67%	BBB
16.0	5.01%	BBB
22.0	5.02%	BBB
23.0	5.07%	BBB

Closest to the ten year maturity

Cost of Debt

Only use IS / BS numbers as a last resort!

Publicly traded debt

- Use observed market data

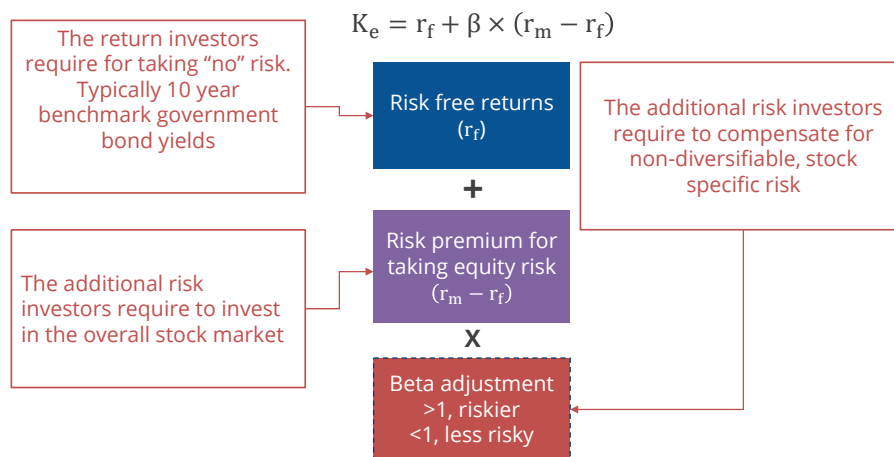
Rated debt but not publicly traded

- Benchmark to similar credits

Not rated, not traded

- Benchmark to companies with similar risk profiles

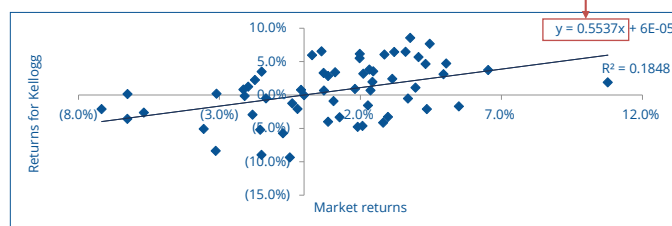
Cost of Equity – CAPM



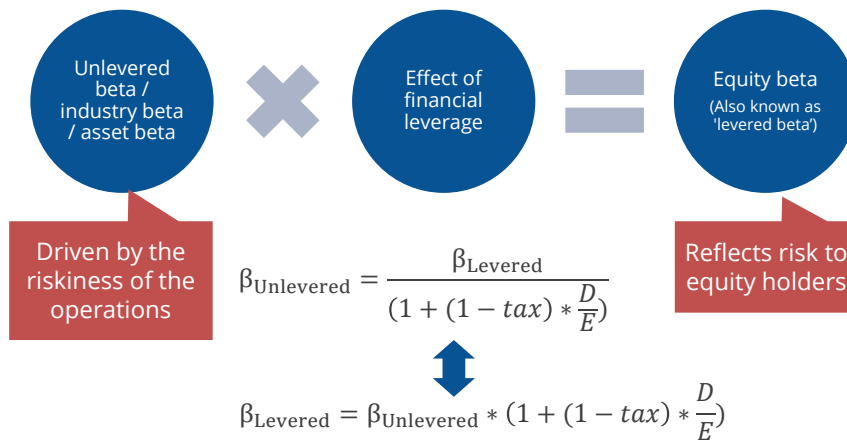
Beta

Ticker	Company Name	Levered Beta
NYSE:k	Kellogg Company	0.55367
NYSE:CAG	ConAgra Foods, Inc.	0.39296
NYSE:GIS	General Mills, Inc.	0.34355
NYSE:CPB	Campbell Soup Company	0.54608
NYSE:HSY	The Hershey Company	0.34460
NasdaqGS:MDLZ	Mondelez International, Inc.	0.97002
NYSE:HRL	Hormel Foods Corporation	0.71835
NYSE:DF	Dean Foods Company	0.96572
NYSE:WWAV	The WhiteWave Foods Company	1.76027

The slope of the line in the correlation is the beta



Beta



Risk Premium – Historical

Arithmetic average returns

	S&P 500	10-Yr T. bond	Risk premium
1928-2015	11.41%	5.23%	6.18%
1965-2015	11.01%	7.12%	3.89%
2005-2015	9.03%	5.16%	3.88%

Geometric average returns

	S&P 500	10-Yr T. bond	Risk premium
1928-2015	9.50%	4.96%	4.54%
1965-2015	9.61%	6.71%	2.90%
2005-2015	7.25%	4.71%	2.53%

$$K_e = r_f + \beta \times (r_m - r_f)$$

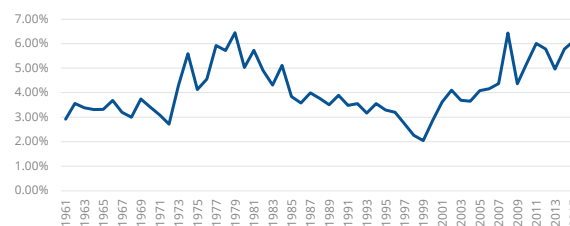
Equity return minus T-bond return = equity risk premium

Source: Aswath Damodaran

Risk Premium – Implied

$$\text{Aggregate value of equities} = \frac{\text{Aggregate Dividend}_{t+1}}{K_e - \text{LT growth rate}}$$

$$\Rightarrow K_e = \frac{\text{Aggregate Dividend}_{t+1}}{\text{Aggregate Value of equities}} + \text{LT growth rate}$$



Source: Aswath Damodaran

Capital Structure – Current Versus Target

WACC calculation should be based on target capital structure

A peer group analysis can give guidance as to expected long term capital structure

	Debt / (debt + equity)
Mondelez International, Inc.	21.9%
ConAgra Foods, Inc.	30.2%
Kellogg Company	23.9%
General Mills, Inc.	21.4%
Campbell Soup Company	20.5%
Danone	26.2%

Outlier

The food industry comparables indicate that the optimal capital structure for the industry is 20 – 25% debt / capital

WACC Sensitivity Analysis

WACC, along with long term growth rate is hugely important in a DCF valuation

A sensitivity table will allow you to get a sense of the impact

		Long term growth rate				
		2.4%	2.2%	2.0%	1.8%	1.6%
WACC	8.1%	16.03	15.40	14.80	14.25	13.73
	8.3%	15.00	14.42	13.87	13.36	12.88
	8.5%	14.04	13.50	13.00	12.53	12.08
	8.7%	13.14	12.64	12.18	11.74	11.33
	8.9%	12.29	11.84	11.41	11.00	10.62