Aswath Damodaran

VALUATION

Cynic: A person who knows the price of everything but the value of nothing.. Oscar Wilde

First Principles



Three approaches to valuation

- Intrinsic valuation: The value of an asset is a function of its fundamentals – cash flows, growth and risk. In general, discounted cash flow models are used to estimate intrinsic value.
- Relative valuation: The value of an asset is estimated based upon what investors are paying for similar assets. In general, this takes the form of value or price multiples and comparing firms within the same business.
- 3. Contingent claim valuation: When the cash flows on an asset are contingent on an external event, the value can be estimated using option pricing models.

Intrinsic Value: Four Basic Propositions

The value of an asset is the present value of the expected cash flows on that asset, over its expected life:

Value of asset =
$$\frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)}{(1+r)^2} + \frac{E(CF_3)}{(1+r)^3} \dots + \frac{E(CF_n)}{(1+r)^n}$$

1.The IT Proposition: If "it" does not affect the cash flows or alter risk (thus changing discount rates), "it" cannot affect value.

2. The DUH Proposition: For an asset to have value, the expected cash flows have to be positive some time over the life of the asset.

3. The DON'T FREAK OUT Proposition: Assets that generate cash flows early in their life will be worth more than assets that generate cash flows later; the latter may however have greater growth and higher cash flows to compensate.

4. The VALUE IS NOT PRICE Proposition: The value of an asset may be very different from its price.

DCF Choices: Equity Valuation versus Firm Valuation





The Ingredients that determine value.



I. Estimating Cash Flows



Estimating FCFF: Disney

- □ In the fiscal year ended September 2013, Disney reported the following:
 - Operating income (adjusted for leases) = \$10,032 million
 - Effective tax rate = 31.02%
 - Capital Expenditures (including acquisitions) = \$5,239 million
 - Depreciation & Amortization = \$2,192 million
 - Change in non-cash working capital = \$103 million
- The free cash flow to the firm can be computed as follows:

After-tax Operating Income	= 10,032 (13102)	= \$6,920
- Net Cap Expenditures	= \$5,239 - \$2,192	= \$3,629
 Change in Working Capital 	=	=\$103
= Free Cashflow to Firm (FCFF)	=	= \$3,188

- The reinvestment and reinvestment rate are as follows:
 - Reinvestment = \$3,629 + \$103 = \$3,732 million
 - Reinvestment Rate = \$3,732/ \$6,920 = 53.93%

II. Discount Rates

- Keep it current: When doing a valuation, you need a discount rate that reflects today's conditions. Not only does this require you to update the base risk free rate, but also your risk premiums (equity risk premium and default spread) and perhaps even your measures of risk (betas, default risk measures)
- Keep it consistent: At an intuitive level, the discount rate used should be consistent with both the riskiness and the type of cash flow being discounted. The cost of equity is the rate at which we discount cash flows to equity (dividends or free cash flows to equity). The cost of capital is the rate at which we discount free cash flows to the firm.
- Keep it in perspective: The discount rate obviously matters in a discounted cash flow valuation, but not as much as your other inputs. In fact, as uncertainty about the future increases, the more you should focus on estimating cash flows and the less your should focus on discount rates.

Current Cost of Capital: Disney

The beta for Disney's stock in November 2013 was 1.0013. The T. bond rate at that time was 2.75%. Using an estimated equity risk premium of 5.76%, we estimated the cost of equity for Disney to be 8.52%:

Cost of Equity = 2.75% + 1.0013(5.76%) = 8.52%

Disney's bond rating in May 2009 was A, and based on this rating, the estimated pretax cost of debt for Disney is 3.75%. Using a marginal tax rate of 36.1, the after-tax cost of debt for Disney is 2.40%.

After-Tax Cost of Debt = 3.75% (1 - 0.361) = 2.40%

The cost of capital was calculated using these costs and the weights based on market values of equity (121,878) and debt (15.961):
 Cost of capital = 121,878

$$= 8.52\% \ \frac{121,878}{(15,961+121,878)} + 2.40\% \ \frac{15,961}{(15,961+121,878)} = 7.81\%$$

But costs of equity and capital can and should change over time...

			After-tax		
		Cost of	Cost of		
Year	Beta	Equity	Debt	Debt Ratio	Cost of capital
1	1.0013	8.52%	2.40%	11.50%	7.81%
2	1.0013	8.52%	2.40%	11.50%	7.81%
3	1.0013	8.52%	2.40%	11.50%	7.81%
4	1.0013	8.52%	2.40%	11.50%	7.81%
5	1.0013	8.52%	2.40%	11.50%	7.81%
6	1.0010	8.52%	2.40%	13.20%	7.71%
7	1.0008	8.51%	2.40%	14.90%	7.60%
8	1.0005	8.51%	2.40%	16.60%	7.50%
9	1.0003	8.51%	2.40%	18.30%	7.39%
10	1.0000	8.51%	2.40%	20.00%	7.29%



Estimating Growth in EBIT: Disney

We started with the reinvestment rate that we computed from the 2013 financial statements: $\frac{(3,629+103)}{10,032(1-.3102)} = 53.93\%$

Reinvestment rate =

We computed the reinvestment rate in prior years to ensure that the 2013 values were not unusual or outliers.

□ We compute the return on capital, using operating income in 2013 and capital invested at the start of the year: EBIT (1-t)

10,032 (1-.361) Return on Capital₂₀₁₃ = $\frac{\text{EBIT (1-t)}}{(BV \text{ of Equity+ BV of Debt - Cash})} = \frac{10,032 (1-.361)}{(41,958+16,328-3,387)}$ = 12.61%

Disney's return on capital has improved gradually over the last decade and has levelled off in the last two years.

□ If Disney maintains its 2013 reinvestment rate and return on capital for the next five years, its growth rate will be 6.80 percent.

Expected Growth Rate from Existing Fundamentals = 53.93% * 12.61% = 6.8%

IV. Getting Closure in Valuation

Since we cannot estimate cash flows forever, we estimate cash flows for a "growth period" and then estimate a terminal value, to capture the value at the end of the period:

Value =
$$\sum_{t=1}^{t=N} \frac{CF_t}{(1+r)^t} + \frac{\text{Terminal Value}}{(1+r)^N}$$

- When a firm's cash flows grow at a "constant" rate forever, the present value of those cash flows can be written as:
 - Value = Expected Cash Flow Next Period / (r g)
 - where,
 - r = Discount rate (Cost of Equity or Cost of Capital)
 - g = Expected growth rate forever.
- This "constant" growth rate is called a stable growth rate and cannot be higher than the growth rate of the economy in which the firm operates.

Getting to stable growth...

- A key assumption in all discounted cash flow models is the period of high growth, and the pattern of growth during that period. In general, we can make one of three assumptions:
 - there is no high growth, in which case the firm is already in stable growth
 - there will be high growth for a period, at the end of which the growth rate will drop to the stable growth rate (2-stage)
 - there will be high growth for a period, at the end of which the growth rate will decline gradually to a stable growth rate(3-stage)
- The assumption of how long high growth will continue will depend upon several factors including:
 - **•** the size of the firm (larger firm -> shorter high growth periods)
 - current growth rate (if high -> longer high growth period)
 - barriers to entry and differential advantages (if high -> longer growth period)

Estimating Stable Period Inputs: Disney

- <u>Respect the cap</u>: The growth rate forever is assumed to be 2.5. This is set lower than the riskfree rate (2.75%).
- Stable period excess returns: The return on capital for Disney will drop from its high growth period level of 12.61% to a stable growth return of 10%. This is still higher than the cost of capital of 7.29% but the competitive advantages that Disney has are unlikely to dissipate completely by the end of the 10th year.
- <u>Reinvest to grow</u>: Based on the expected growth rate in perpetuity (2.5%) and expected return on capital forever after year 10 of 10%, we compute s a stable period reinvestment rate of 25%:
 - Reinvestment Rate = Growth Rate / Return on Capital = 2.5% /10% = 25%
 - <u>Adjust risk and cost of capital</u>: The beta for the stock will drop to one, reflecting Disney's status as a mature company.
 - Cost of Equity = Riskfree Rate + Beta * Risk Premium = 2.75% + 5.76% = 8.51%
 - The debt ratio for Disney will rise to 20%. Since we assume that the cost of debt remains unchanged at 3.75%, this will result in a cost of capital of 7.29%
 - □ Cost of capital = 8.51% (.80) + 3.75% (1-.361) (.20) = 7.29%

V. From firm value to equity value per share

Approach used	To get to equity value per share
Discount dividends per share at the cost of equity	Present value is value of equity per share
Discount aggregate FCFE at the cost of equity	Present value is value of aggregate equity. Subtract the value of equity options given to managers and divide by number of shares.
Discount aggregate FCFF at the cost of capital	 PV = Value of operating assets + Cash & Near Cash investments + Value of minority cross holdings -Debt outstanding = Value of equity -Value of equity options =Value of equity in common stock / Number of shares

Disney: Inputs to Valuation

	High Growth Phase	Transition Phase	Stable Growth Phase
Length of Period	5 years	5 years	Forever after 10 years
Tax Rate	31.02% (Effective)	31.02% (Effective)	31.02% (Effective)
	36.1% (Marginal)	36.1% (Marginal)	36.1% (Marginal)
Return on Capital	12.61%	Declines linearly to 10%	Stable ROC of 10%
Reinvestment Rate	53.93% (based on normalized	Declines gradually to 25%	25% of after-tax operating
	acquisition costs)	as ROC and growth rates	income.
		drop:	Reinvestment rate = g/ ROC
			= 2.5/10=25%
Expected Growth	ROC * Reinvestment Rate =	Linear decline to Stable	2.5%
Rate in EBIT	0.1261*.5393 = .068 or 6.8%	Growth Rate of 2.5%	
Debt/Capital Ratio	11.5%	Rises linearly to 20.0%	20%
Risk Parameters	Beta = 1.0013, $k_e = 8.52\%\%$	Beta changes to 1.00;	Beta = 1.00; $k_e = 8.51\%$
	Pre-tax Cost of Debt = 3.75%	Cost of debt stays at 3.75%	Cost of debt stays at 3.75%
	Cost of capital = 7.81%	Cost of capital declines	Cost of capital = 7.29%
		gradually to 7.29%	



Investment decision affects risk of assets being finance and financing decision affects hurdle rate



Disney: Corporate Financing Decisions and Firm Value

Ways of changing value...





First Principles

