

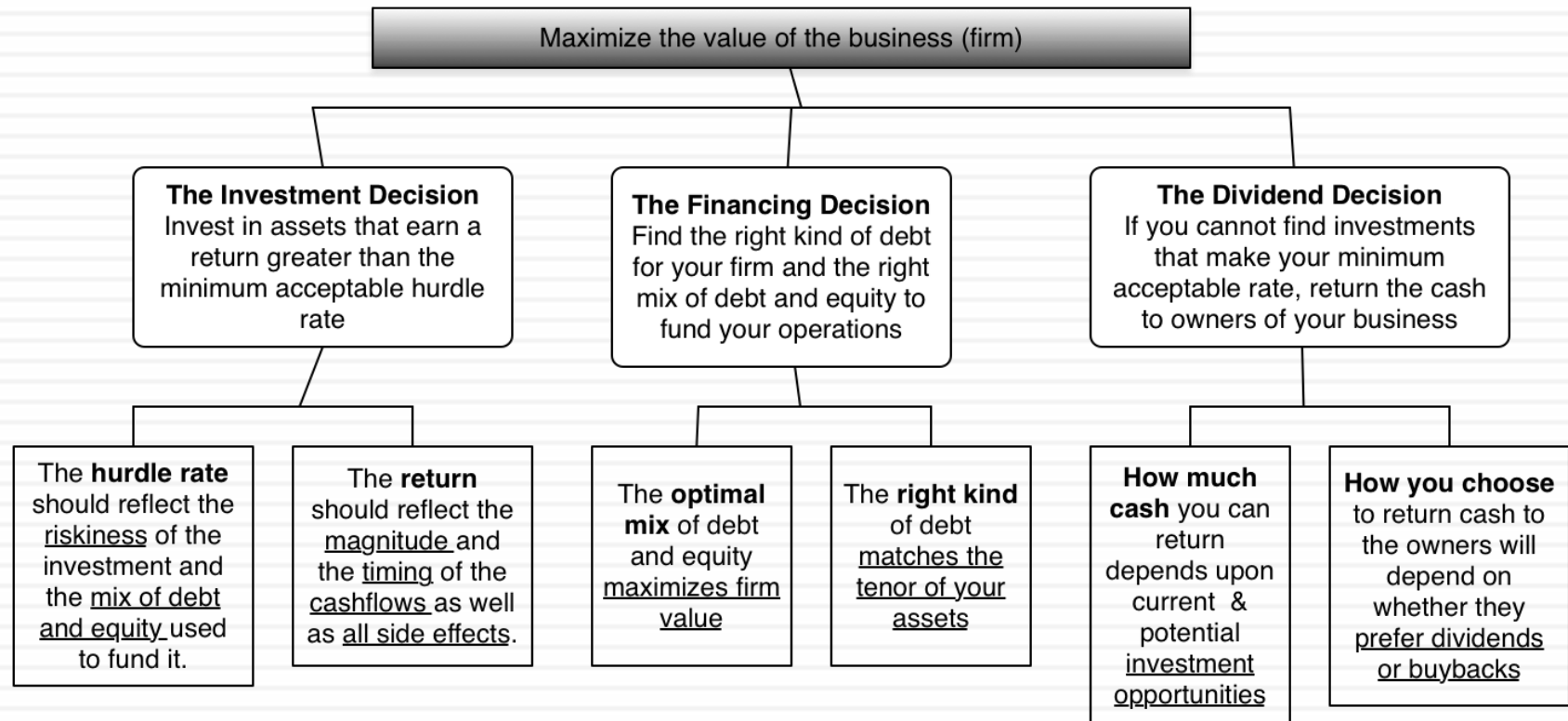
Aswath Damodaran



VALUATION

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

First Principles



Three approaches to valuation

1. 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.
2. 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

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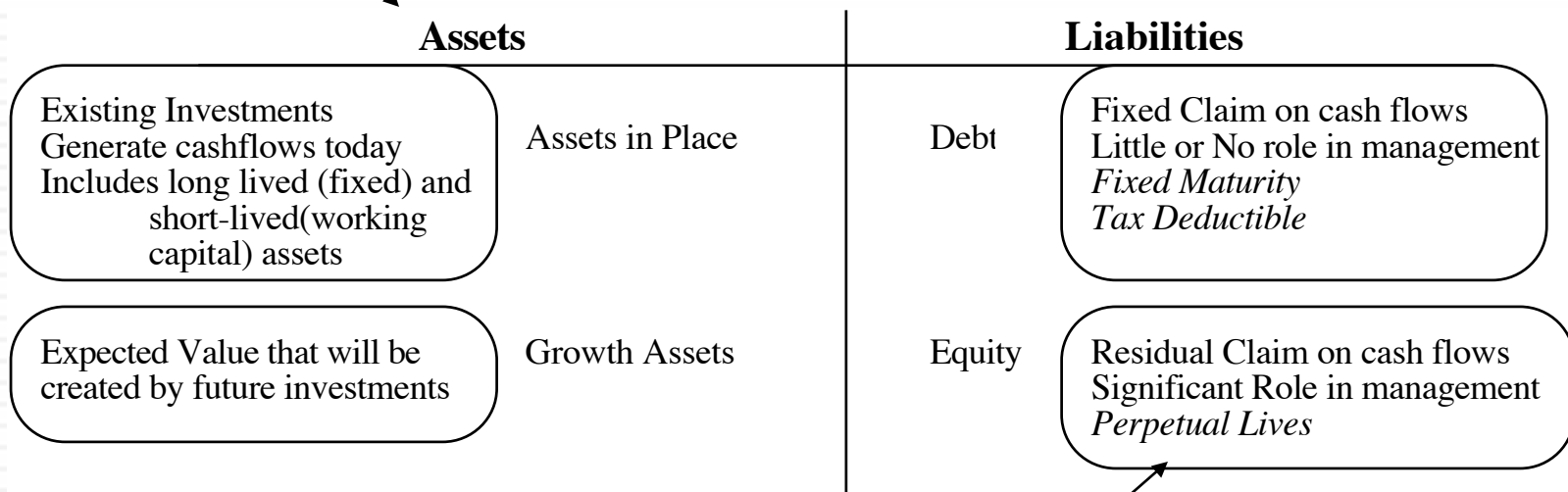
The value of an asset is the present value of the expected cash flows on that asset, over its expected life:

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

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.

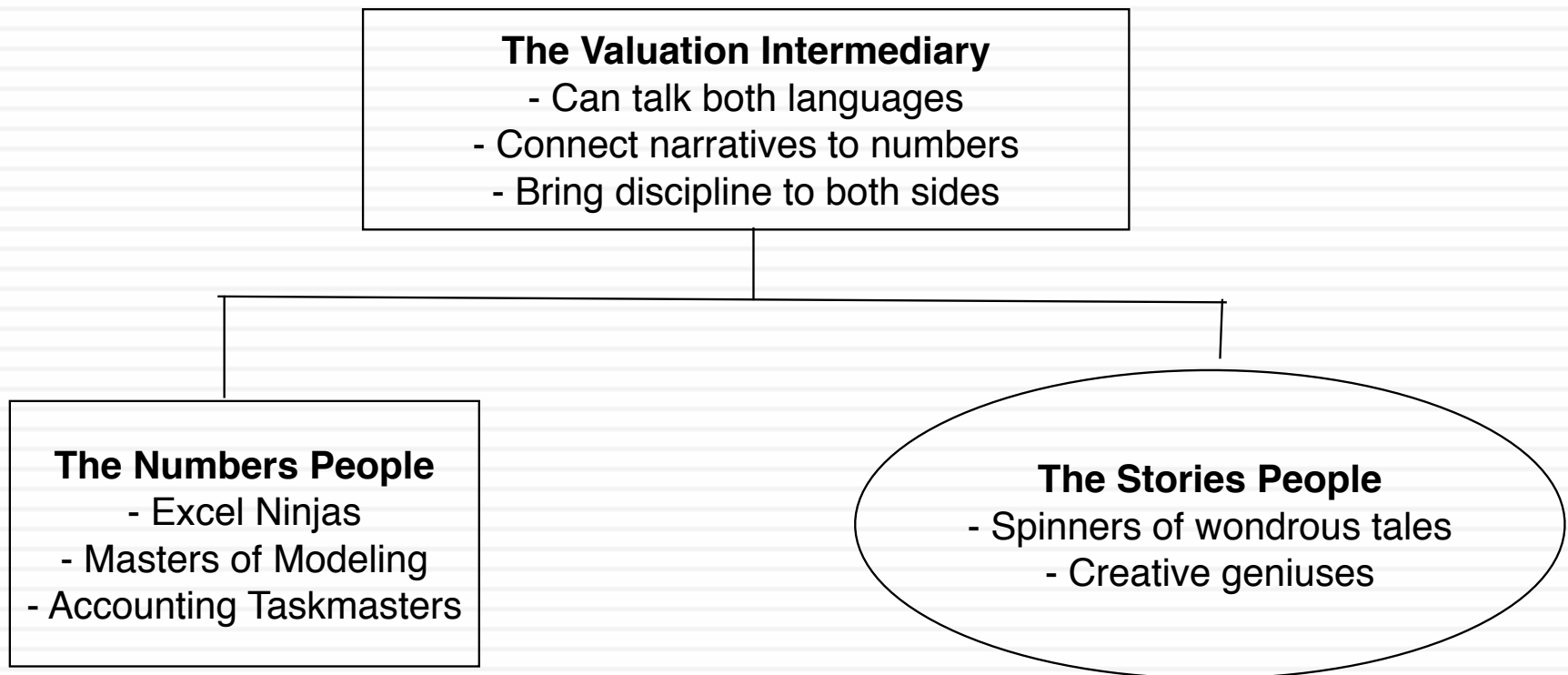
DCF Choices: Equity Valuation versus Firm Valuation

Firm Valuation: Value the entire business

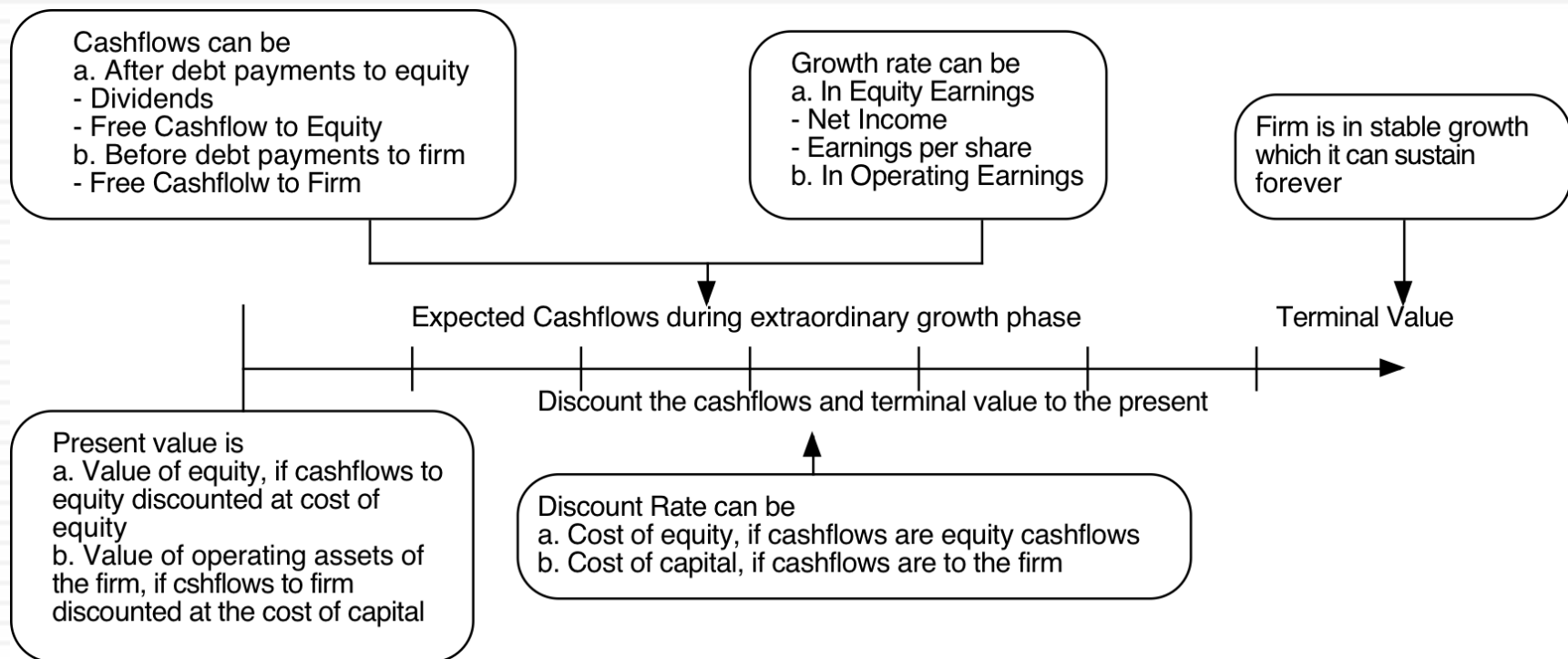


Equity valuation: Value just the equity claim in the business

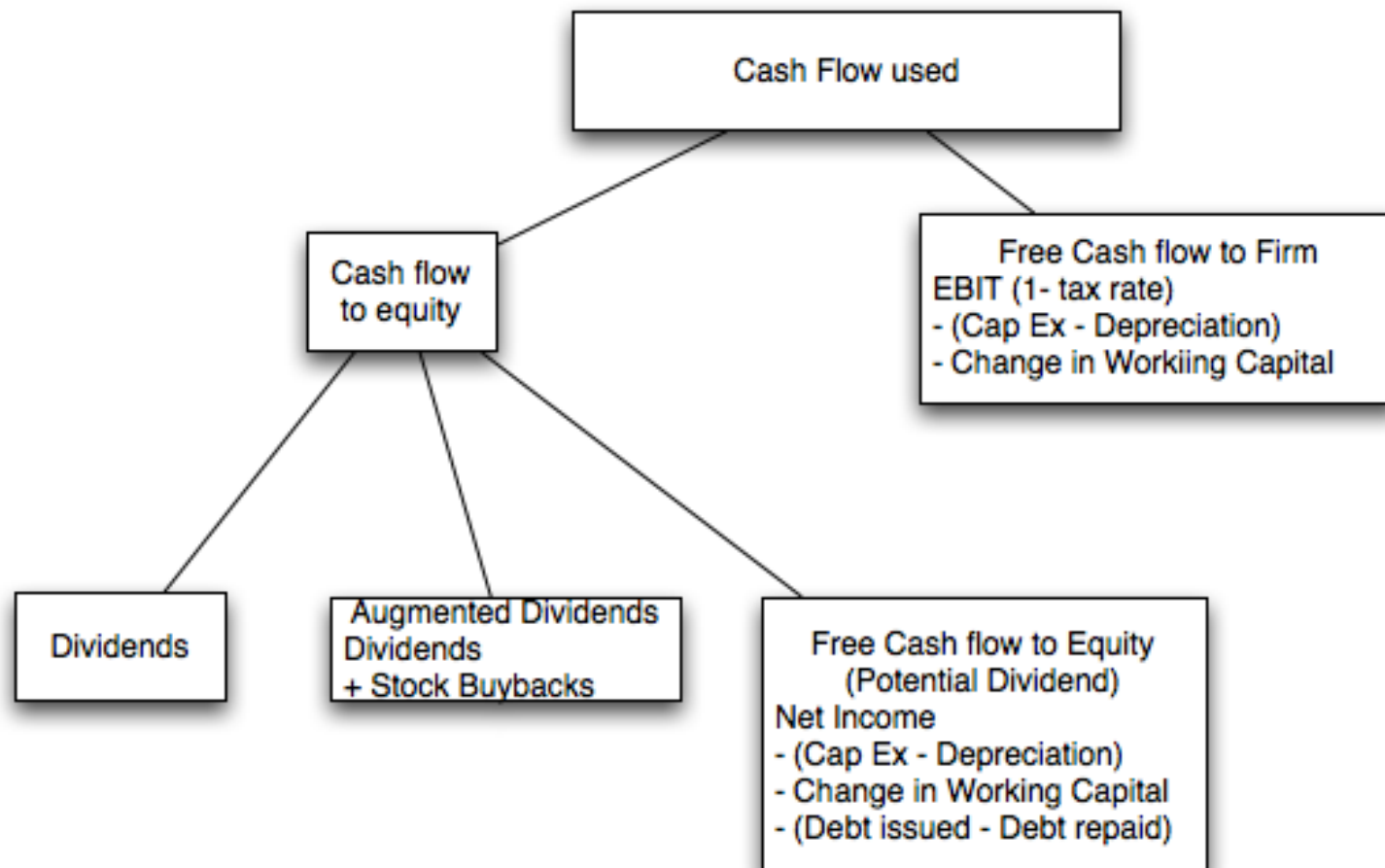
The Set Up



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 (1 - .3102)	=	\$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 you 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%:

$$\text{Cost of Equity} = 2.75\% + 1.0013(5.76\%) = 8.52\%$$

- 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%.

$$\text{After-Tax Cost of Debt} = 3.75\% (1 - 0.361) = 2.40\%$$

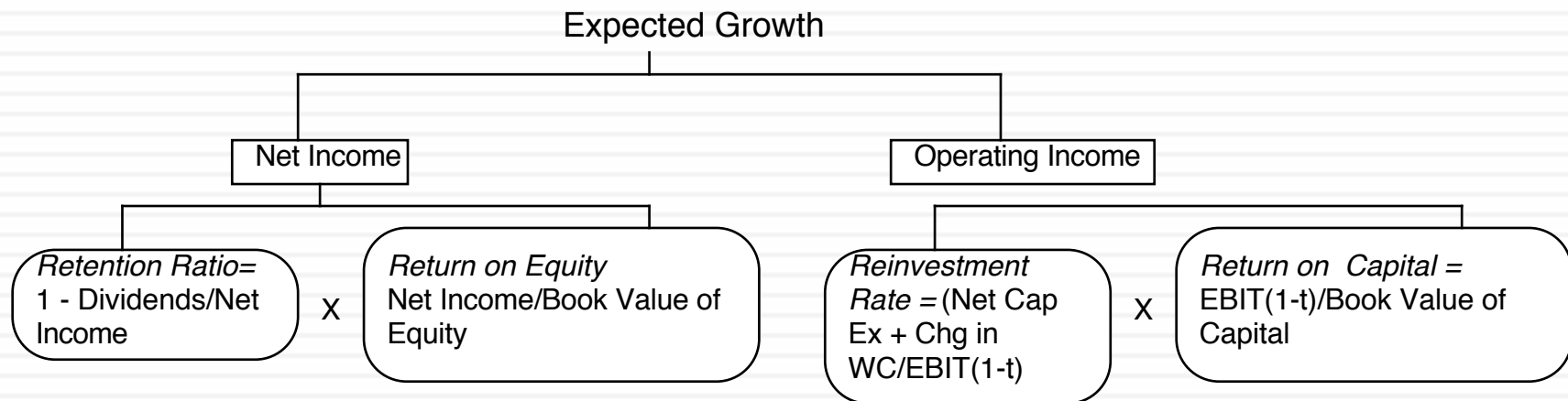
- The cost of capital was calculated using these costs and the weights based on market values of equity (121,878) and debt (15,961):

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

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

Year	Beta	Cost of Equity	After-tax Cost of 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%

III. Expected Growth



Estimating Growth in EBIT: Disney

- We started with the reinvestment rate that we computed from the 2013 financial statements:

$$\text{Reinvestment rate} = \frac{(3,629 + 103)}{10,032 (1 - .3102)} = 53.93\%$$

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:

$$\text{Return on Capital}_{2013} = \frac{\text{EBIT} (1-t)}{(\text{BV of Equity} + \text{BV of Debt} - \text{Cash})} = \frac{10,032 (1 - .361)}{(41,958 + 16,328 - 3,387)} = 12.61\%$$

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.

$$\text{Expected Growth Rate from Existing Fundamentals} = 53.93\% * 12.61\% = 6.8\%$$

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:

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

- 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

- Respect the cap: 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.
- Reinvest to grow: Based on the expected growth rate in perpetuity (2.5%) and expected return on capital forever after year 10 of 10%, we compute a stable period reinvestment rate of 25%:
 - $\text{Reinvestment Rate} = \text{Growth Rate} / \text{Return on Capital} = 2.5\% / 10\% = 25\%$
- Adjust risk and cost of capital: The beta for the stock will drop to one, reflecting Disney's status as a mature company.
 - $\text{Cost of Equity} = \text{Riskfree Rate} + \text{Beta} * \text{Risk Premium} = 2.75\% + 5.76\% = 8.51\%$
 - 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%
 - $\text{Cost of capital} = 8.51\% (.80) + 3.75\% (1-.361) (.20) = 7.29\%$

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	$\begin{aligned} \text{PV} &= \text{Value of operating assets} \\ &+ \text{Cash \& Near Cash investments} \\ &+ \text{Value of minority cross holdings} \\ &- \text{Debt outstanding} \\ &= \text{Value of equity} \\ &- \text{Value of equity options} \\ &= \text{Value of equity in common stock} \\ &/ \text{Number of shares} \end{aligned}$

Disney: Inputs to Valuation

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

Disney - November 2013

Current Cashflow to Firm

$EBIT(1-t) = 10,032(1-.31) = 6,920$
 - (Cap Ex - Deprecn) 3,629
 - Chg Working capital 103
 $= FCFF$ 3,188
 $Reinvestment Rate = 3,732/6920 = 53.93\%$
 $Return on capital = 12.61\%$

Reinvestment Rate
 53.93%

Return on Capital
 12.61%

Expected Growth
 $.5393 \times .1261 = .068$ or 6.8%

Stable Growth
 $g = 2.5\%$; Beta = 1.00;
 Debt % = 20%; $k(\text{debt}) = 3.75\%$
 Cost of capital = 7.29%
 Tax rate = 36.1%; ROC = 10%;
 Reinvestment Rate = $2.5/10 = 25\%$

First 5 years

Growth declines gradually to 2.75%

Terminal Value₁₀ = $9,086 / (.0729 - .025) = 189,738$

Op. Assets 125,484
 + Cash: 3,931
 + Non op inv 2,849
 - Debt 15,961
 - Minority Int 2,721
 $= \text{Equity}$ 113,582
 - Options 869
Value/Share \$ 62.26

	1	2	3	4	5	6	7	8	9	10
EBIT * (1 - tax rate)	\$7,391	\$7,893	\$8,430	\$9,003	\$9,615	\$10,187	\$10,704	\$11,156	\$11,531	\$11,819
- Reinvestment	\$3,985	\$4,256	\$4,546	\$4,855	\$5,185	\$4,904	\$4,534	\$4,080	\$3,550	\$2,955
FCFF	\$3,405	\$3,637	\$3,884	\$4,148	\$4,430	\$5,283	\$6,170	\$7,076	\$7,981	\$8,864

Term Yr
 12,114
 3,029
 9,086

Cost of Capital (WACC) = $8.52\% (0.885) + 2.40\% (0.115) = 7.81\%$

Cost of capital declines gradually to 7.29%

Cost of Equity
 8.52%

Cost of Debt
 $(2.75\% + 1.00\%)(1 - .361) = 2.40\%$
 Based on actual A rating

Weights
 E = 88.5% D = 11.5%

In November 2013,
 Disney was trading at
 \$67.71/share

Riskfree Rate:
 Riskfree rate = 2.75%

+

Beta
 1.0013

x

ERP for operations
 5.76%

Unlevered Beta for
 Sectors: 0.9239

D/E = 13.10%

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

Strategic investments determine length of growth period

The Investment Decision
Invest in projects that earn a return greater than a minimum acceptable hurdle rate

The Dividend Decision
If you cannot find investments that earn more than the hurdle rate, return the cash to the owners of the business.

The Financing Decision
Choose a financing mix that minimizes the hurdle rate and match your financing to your assets.

Existing Investments
ROC = 12.61%

New Investments
Return on Capital
12.61%

Reinvestment Rate
53.93%

Financing Mix
D=11.5%; E=88.5%

Financing Choices
Mostly US \$ debt with duration of 6 years

Current EBIT (1-t)
\$ 6,920

Expected Growth Rate = $12.61\% \times 53.93\% = 6.8\%$

Cost of capital = $8.52\% (.885) + 2.4\% (.115) = 7.81\%$

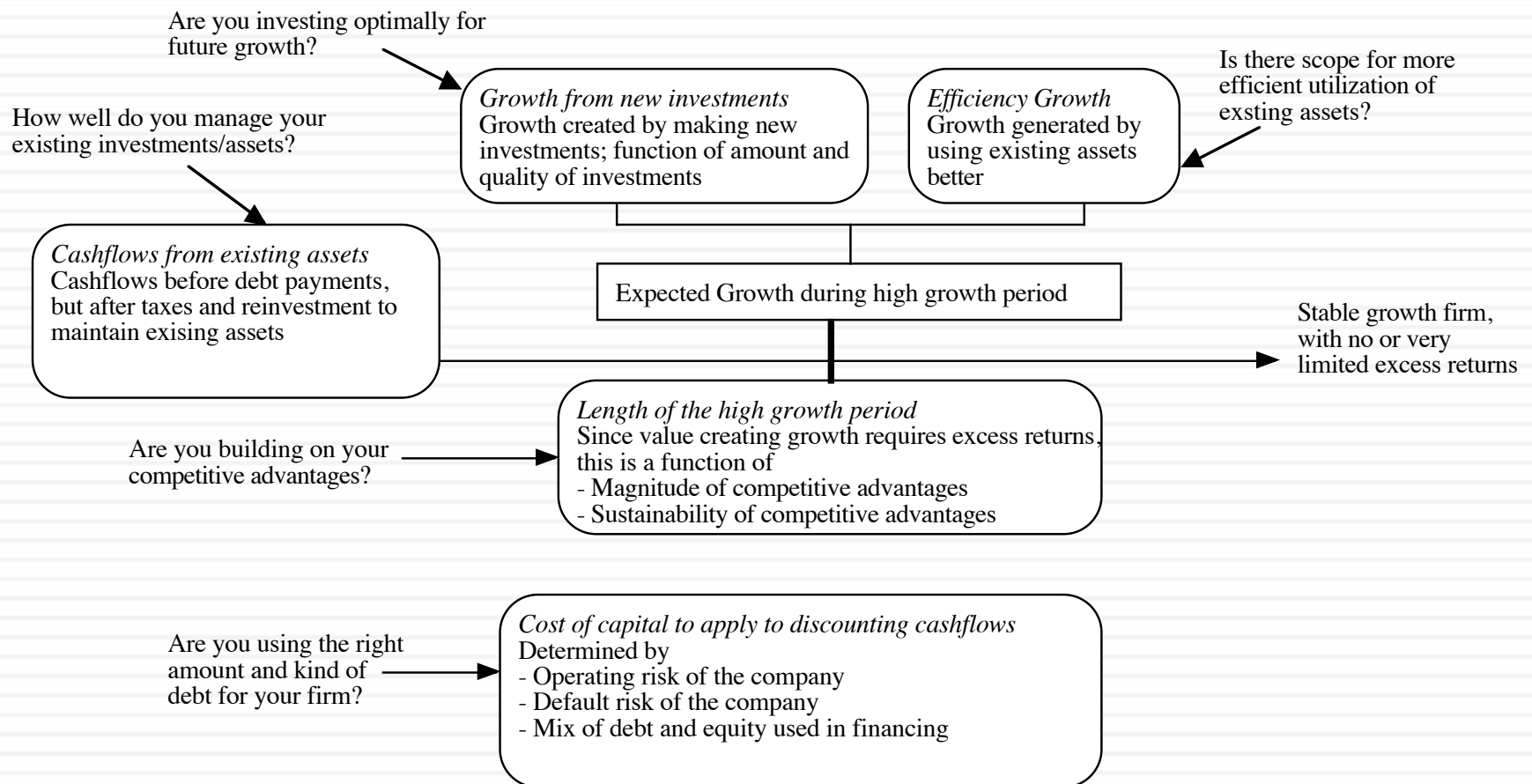
Year	Expected Growth	EBIT (1-t)	Reinvestment	FCFF	Terminal Value	Cost of capital	PV
1	6.80%	\$7,391	\$3,985	\$3,405		7.81%	\$3,158
2	6.80%	\$7,893	\$4,256	\$3,637		7.81%	\$3,129
3	6.80%	\$8,430	\$4,546	\$3,884		7.81%	\$3,099
4	6.80%	\$9,003	\$4,855	\$4,148		7.81%	\$3,070
5	6.80%	\$9,615	\$5,185	\$4,430		7.81%	\$3,041
6	5.94%	\$10,187	\$4,904	\$5,283		7.71%	\$3,367
7	5.08%	\$10,704	\$4,534	\$6,170		7.60%	\$3,654
8	4.22%	\$11,156	\$4,080	\$7,076		7.50%	\$3,899
9	3.36%	\$11,531	\$3,550	\$7,981		7.39%	\$4,094
10	2.50%	\$11,819	\$2,955	\$8,864	\$189,738	7.29%	\$94,966

Value of operating assets of the firm =	\$125,477
Value of Cash & Non-operating assets =	\$6,780
Value of Firm =	\$132,257
Market Value of outstanding debt =	\$15,961
Minority Interests	\$2,721
Market Value of Equity =	\$113,575
Value of Equity in Options =	\$972
Value of Equity in Common Stock =	\$112,603
Market Value of Equity/share =	\$62.56

Aswath Damodaran

Disney: Corporate Financing Decisions and Firm Value

Ways of changing value...



Disney (Restructured)- November 2013

Current Cashflow to Firm

$EBIT(1-t) = 10,032(1-.31) = 6,920$
 - (Cap Ex - Deprecn) 3,629
 - Chg Working capital 103
 = FCFF 3,188
 Reinvestment Rate = $3,732/6920 = 53.93\%$
 Return on capital = 12.61%

Reinvestment Rate
50.00%

More selective
acquisitions &
payoff from gaming

Return on Capital
14.00%

Expected Growth
.50 * .14 = .07 or 7%

Stable Growth

$g = 2.75\%$; Beta = 1.20;
 Debt % = 40%; $k(\text{debt}) = 3.75\%$
 Cost of capital = 6.76%
 Tax rate = 36.1%; ROC = 10%;
 Reinvestment Rate = $2.5/10 = 25\%$

First 5 years

Growth declines
gradually to 2.75%

Terminal Value₁₀ = $9,206 / (.0676 - .025) = 216,262$

Op. Assets 147,704
 + Cash: 3,931
 + Non op inv 2,849
 - Debt 15,961
 - Minority Int 2,721
 = Equity 135,802
 - Options 972
Value/Share \$ 74.91

	1	2	3	4	5	6	7	8	9	10
EBIT * (1 - tax rate)	\$7,404	\$7,923	\$8,477	\$9,071	\$9,706	\$10,298	\$10,833	\$11,299	\$11,683	\$11,975
- Reinvestment	\$3,702	\$3,961	\$4,239	\$4,535	\$4,853	\$4,634	\$4,333	\$3,955	\$3,505	\$2,994
Free Cashflow to Firm	\$3,702	\$3,961	\$4,239	\$4,535	\$4,853	\$5,664	\$6,500	\$7,344	\$8,178	\$8,981

Term Yr
 12,275
 3,069
 9,206

Cost of Capital (WACC) = $8.52\% (0.60) + 2.40\% (0.40) = 7.16\%$

Cost of capital declines
gradually to 6.76%

Cost of Equity
10.34%

Cost of Debt
 $(2.75\% + 1.00\%)(1 - .361)$
 = 2.40%
 Based on synthetic A rating

Weights
 E = 60% D = 40%

In November 2013,
 Disney was trading at
 \$67.71/share

Move to optimal
 debt ratio, with
 higher beta.

Riskfree Rate:
 Riskfree rate = 2.75%

+

Beta
 1.3175

x

ERP for operations
 5.76%

Unlevered Beta for
 Sectors: 0.9239

D/E = 66.67%

First Principles

