



THE FAT LADY IS SINGING: SPRING 2024

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Ponderous Thoughts, or maybe not

1. There are few facts and lots of opinions.
 - a. Even the givens (cash & riskfree rate) are not.
 - b. With accounting and market numbers, all bets are off, as different services report different numbers for the same company. If there is one lesson, it is buyer beware.
2. The real world is a messy place and ever-changing place
 - a. Money making firms can become money losers
 - b. Companies can be restructured/ given facelifts
 - c. Markets are shifting and changing, as the environment changes
 - d. Politics and governments can be key actors.
3. Models don't compute values and optimal paths. You do.

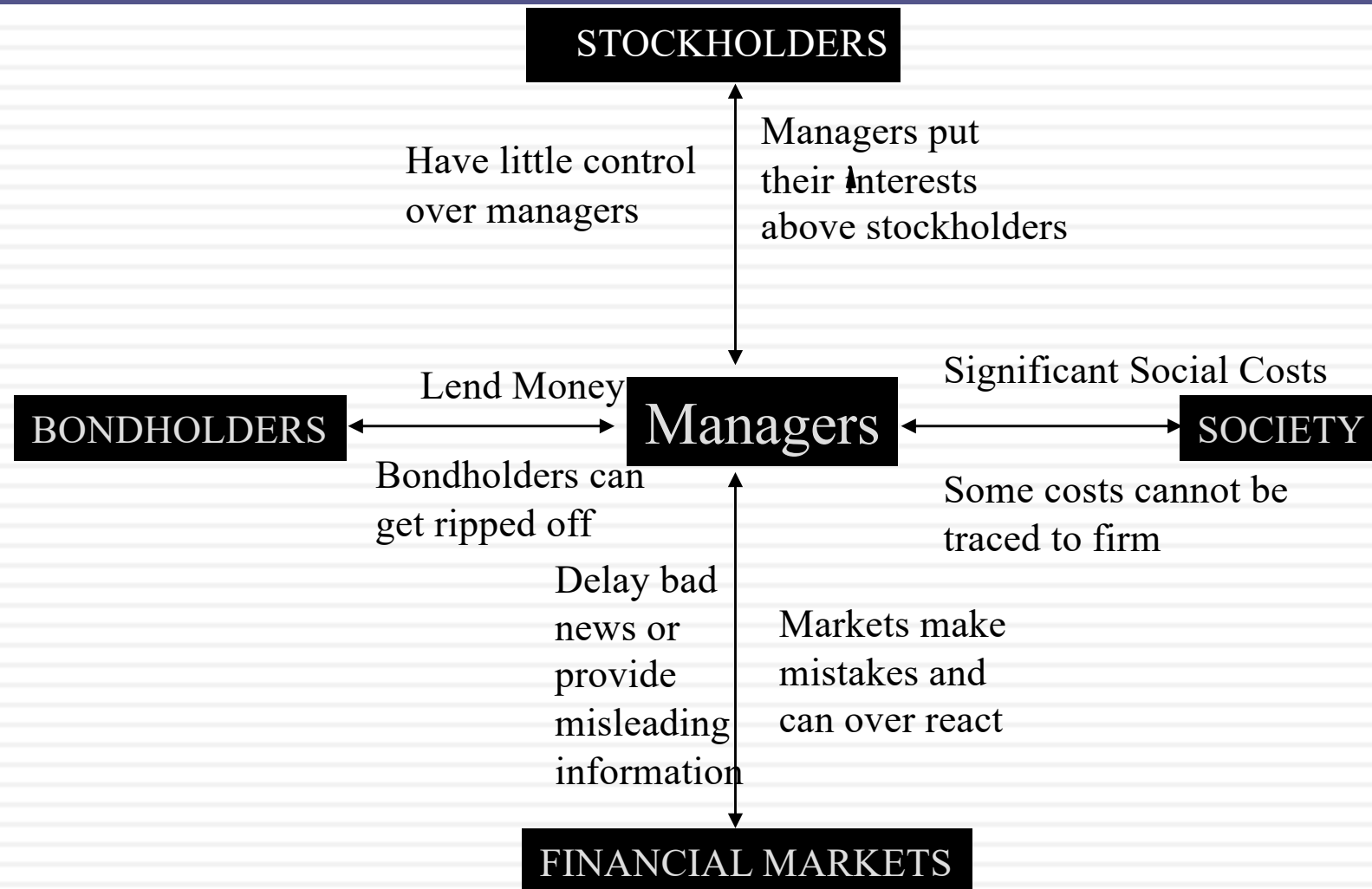
The most analyzed companies this semester were..

Company	Number of analyses
Lululemon	4
Nike	4
Salesforce	4
Starbucks	4
Spotify	4
Netflix	4

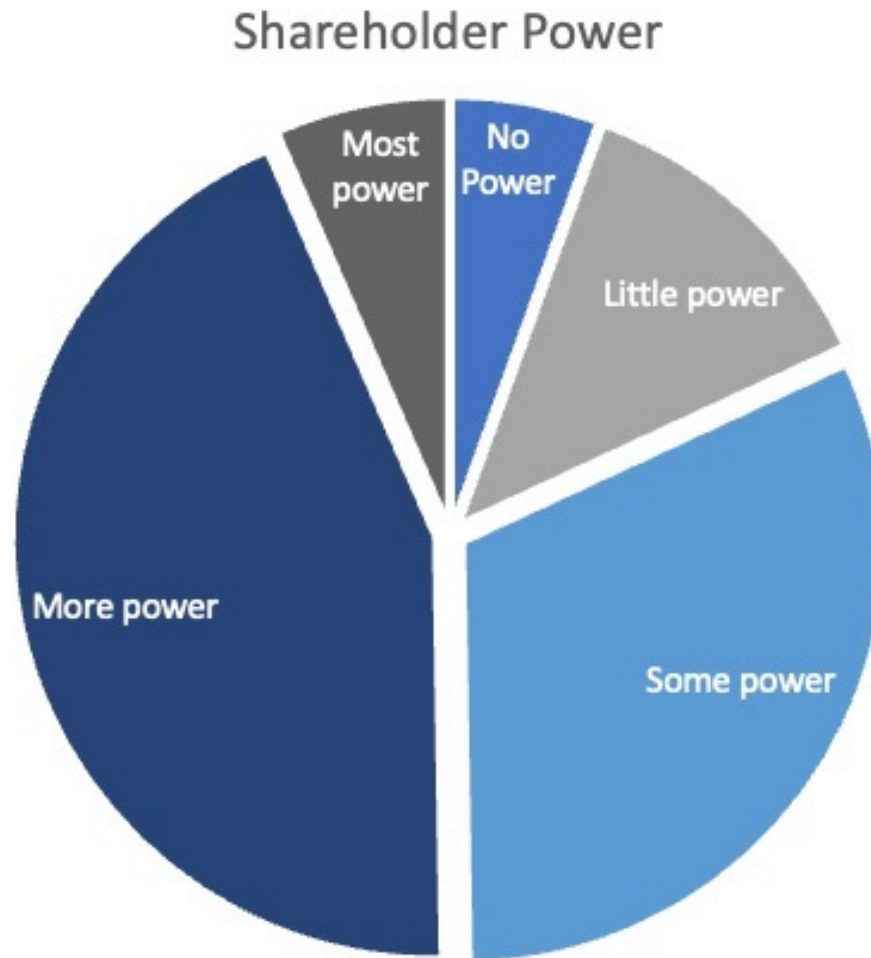
And here's why you can do the same company..

Company	Corp Governance	Marginal Investor	Regression Beta	Jensen's Alpha (% annualized)	R Squared (%)	Bottom up Levered Beta (%)	Equity Risk Premium (in %)	Cost of equity (%)	Debt to Capital Ratio (in %)	Cost of debt (pre-tax) (%)	Cost of Capital (%)	Return on Equity (%)	Return on Capital	Optimal Debt Ratio (%)
Lululemon	1.00	Institution	1.325	16.28%	39.10%	0.80	5.02%	8.31%	2.39%	4.88%	8.20%	49.61%	42.02%	10%
Lululemon	1.00	Institution	1.25	1.28%	34.50%	0.88	4.90%	8.97%	2.62%	4.96%	8.87%	42.43%	34.37%	30%
Lululemon	1.50	Institution	1.302	28.80%	38.40%	1.28	4.70%	12.78%	37.05%	5.73%	12.19%	36.63%	52.42%	9.55%
Lululemon	1.50	Institution	1.247	-5.30%	34.50%	1.09	5.19%	10.10%	2.58%	5.50%	10.15%	42.01%	39.84%	20%

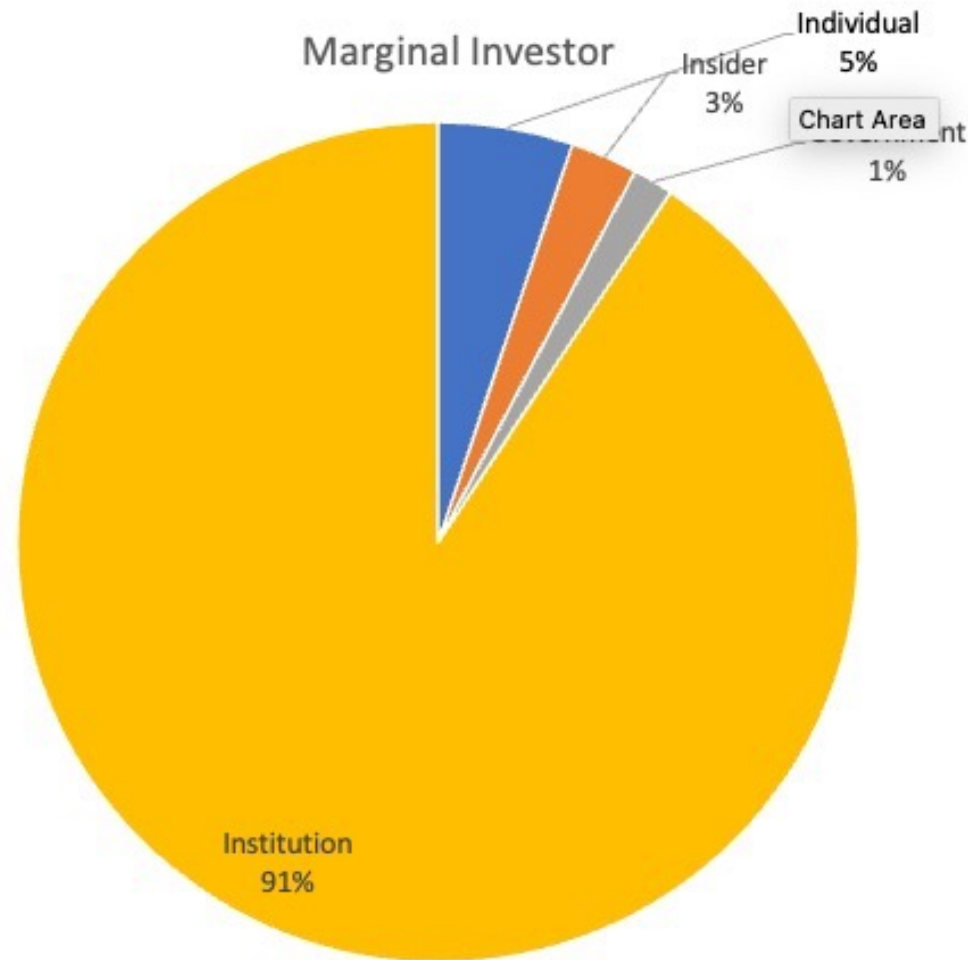
The Breakdown in the Classical Objective Function



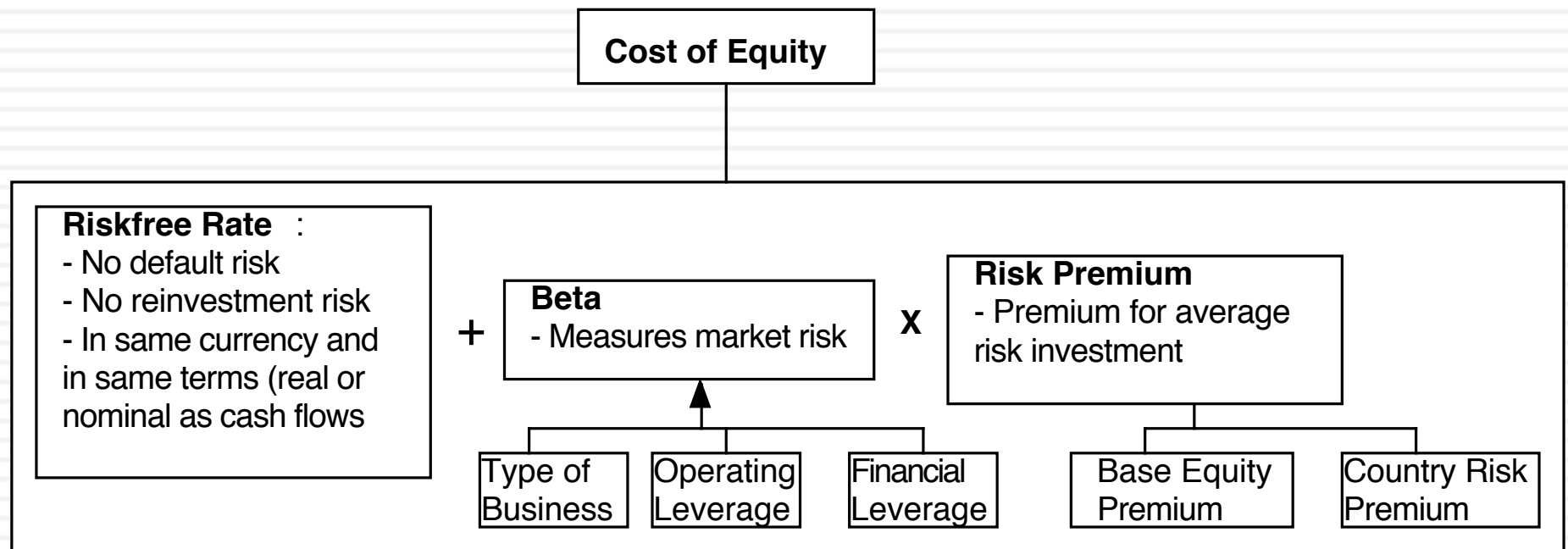
I. Where does the power lie?



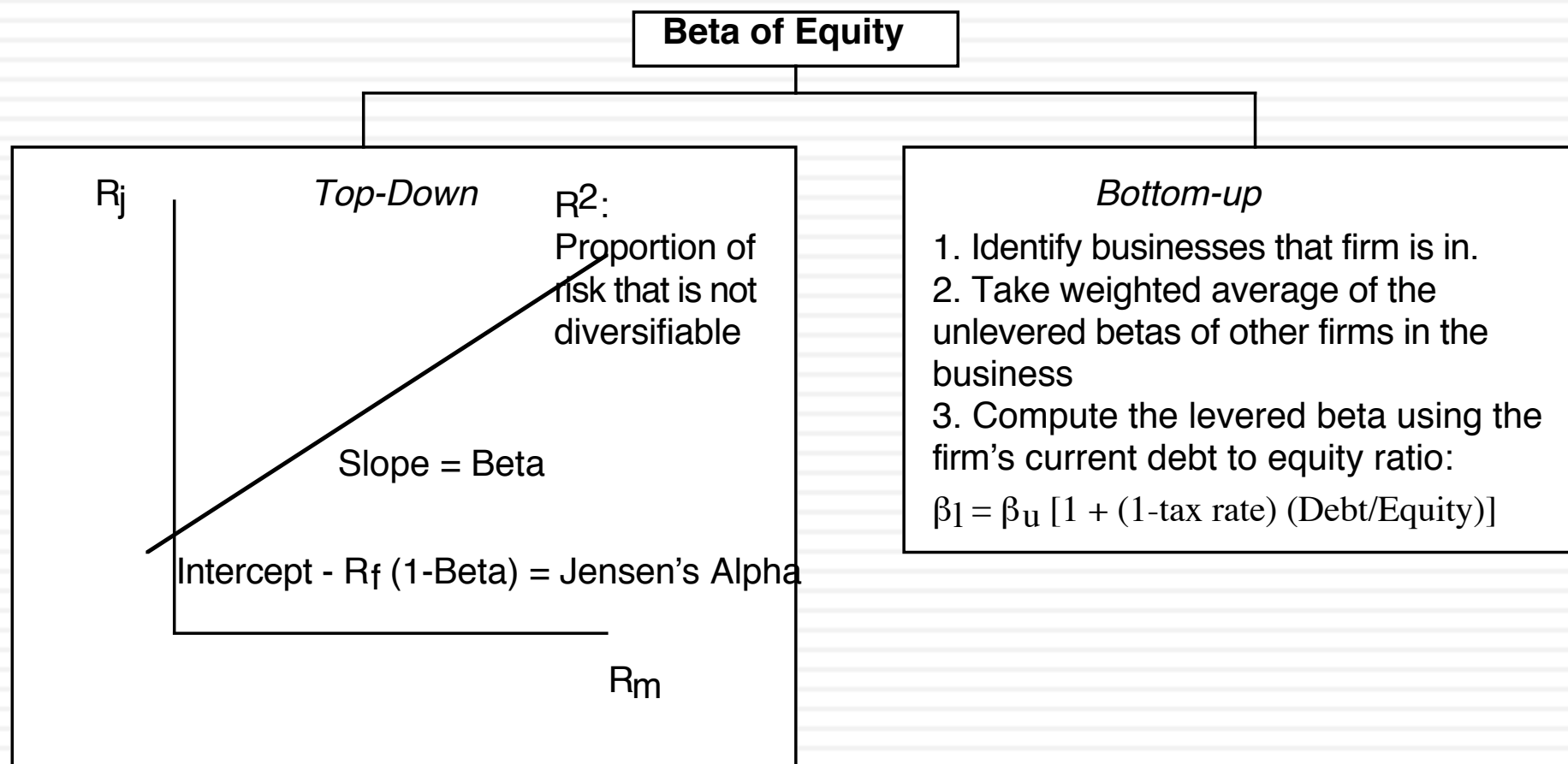
II. Who is your marginal investor?



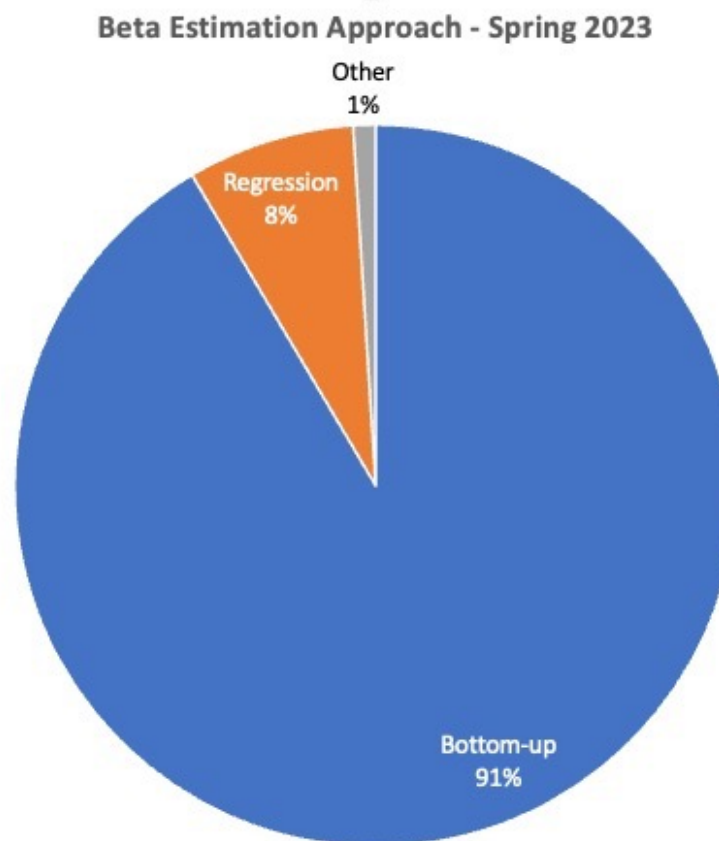
III. Risk Profiles and Costs of Equity



Beta: The Standard Approach



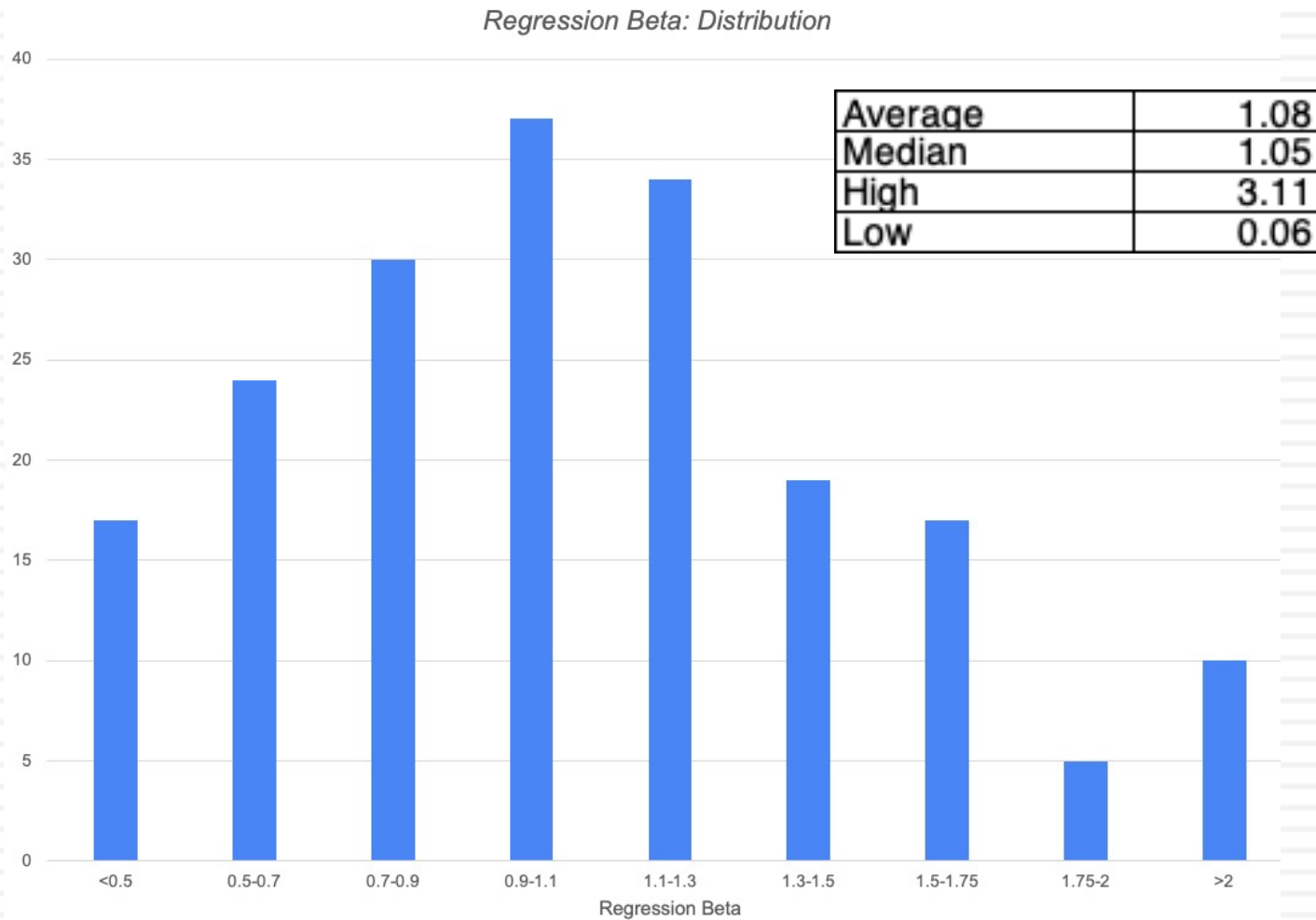
Choice on beta estimation: Spring 2023



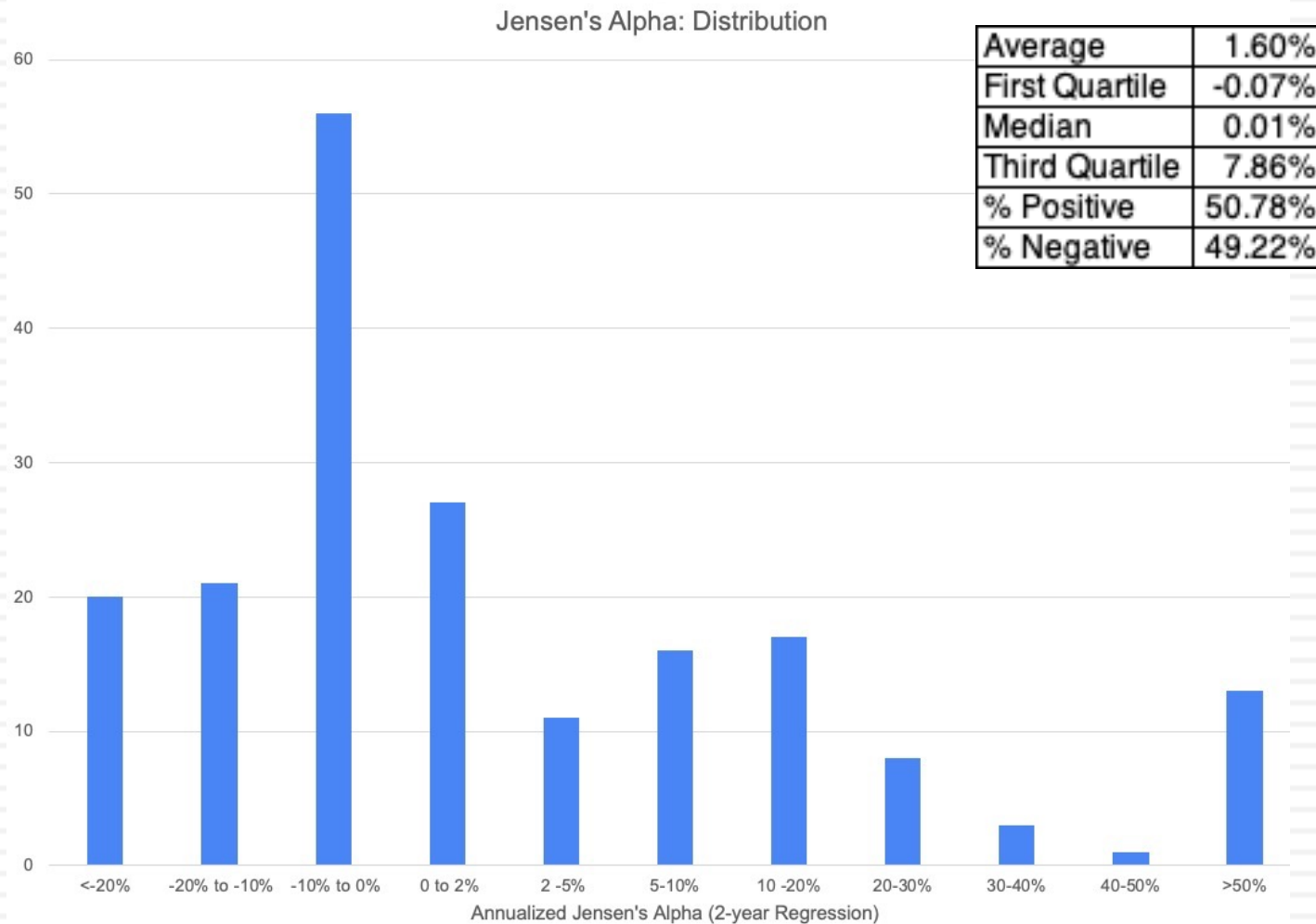
Typical reasons

1. My company is unique. I cannot find comparable firms.
2. My company is in only one line of business
3. My bottom-up beta is too different from my regression beta

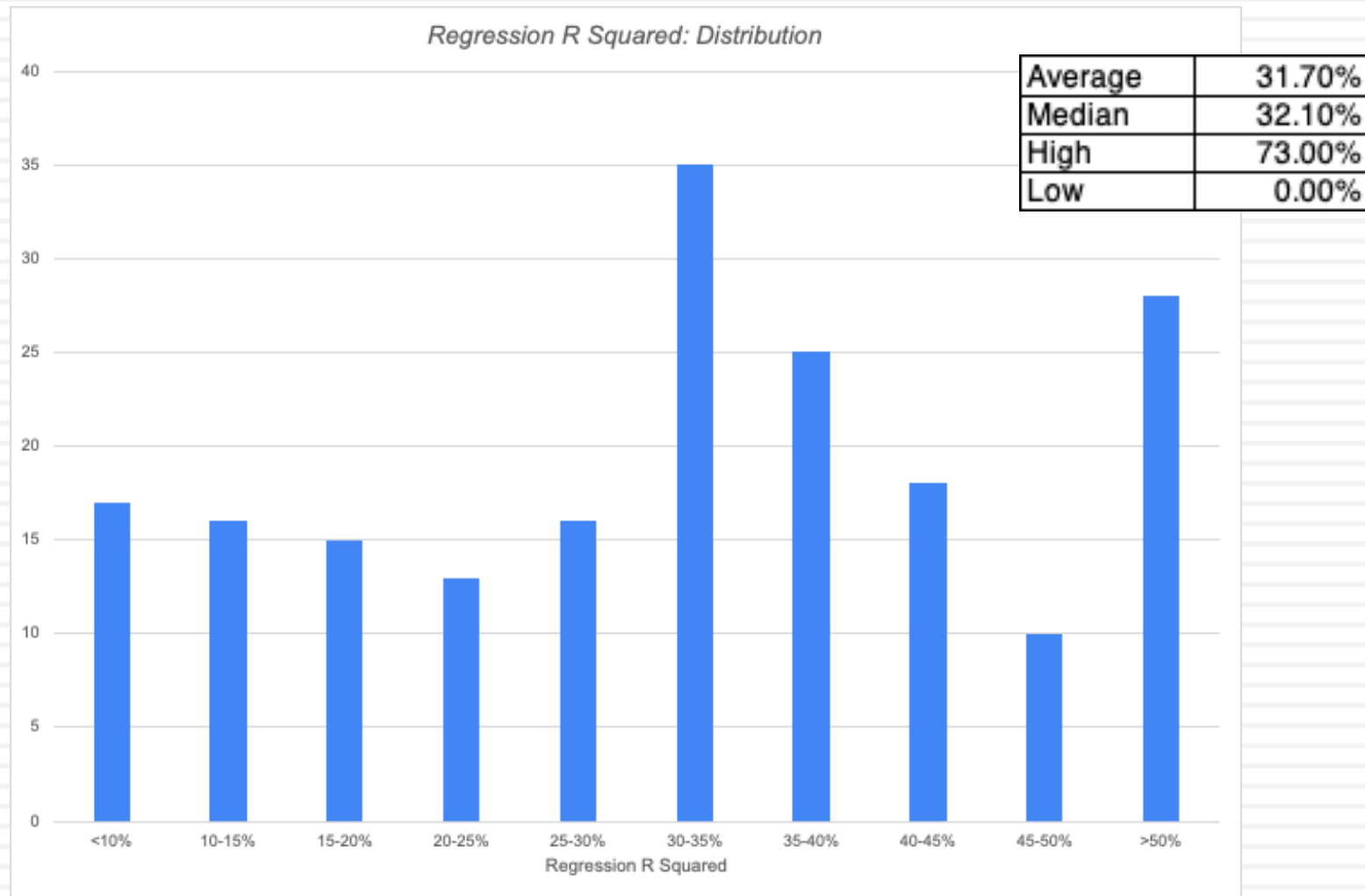
Beta Distribution



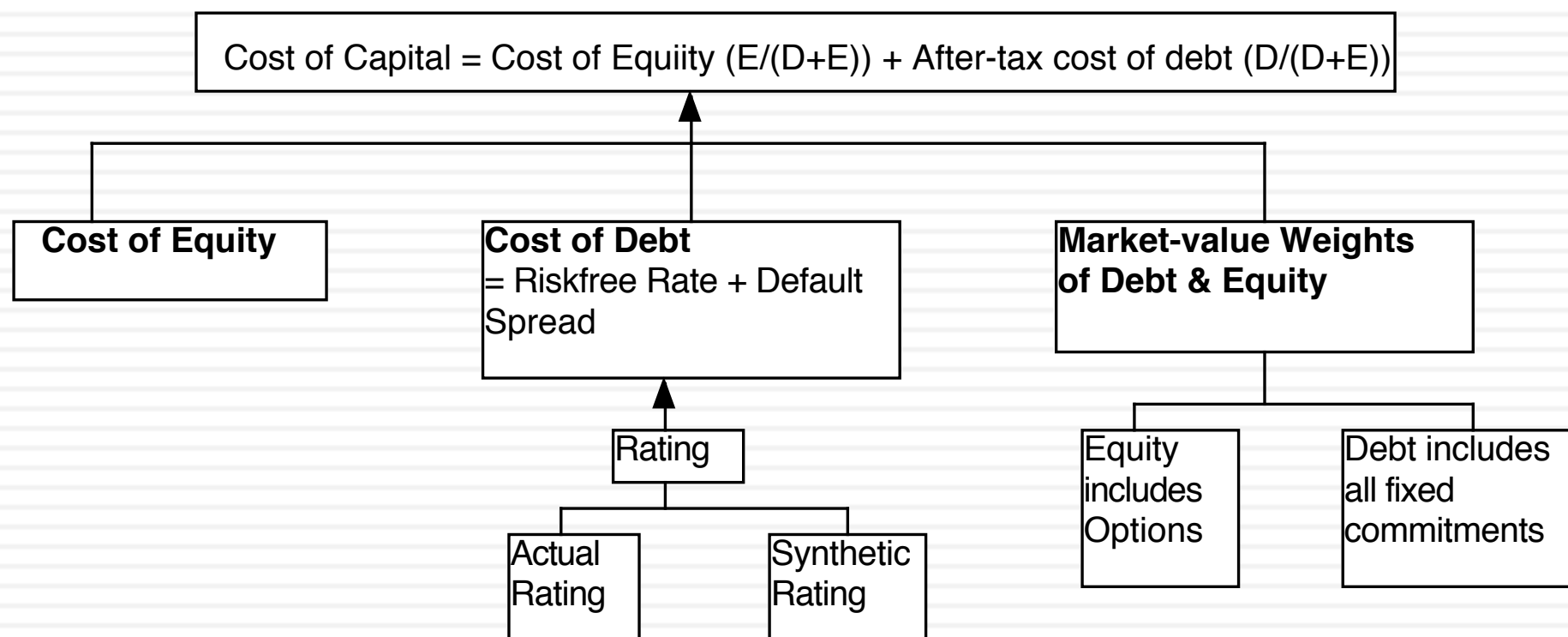
Jensen's Alpha Distribution



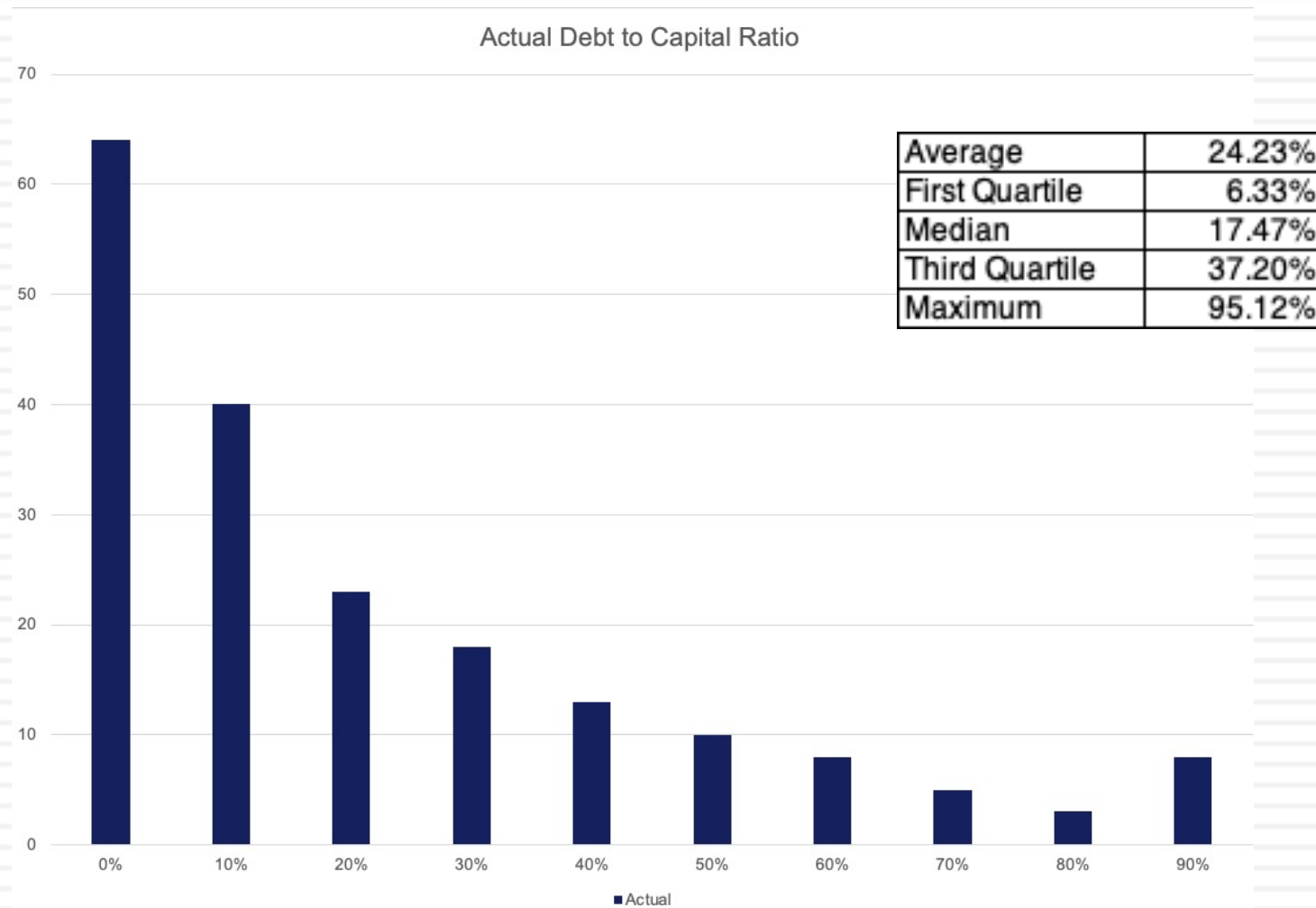
R Squared



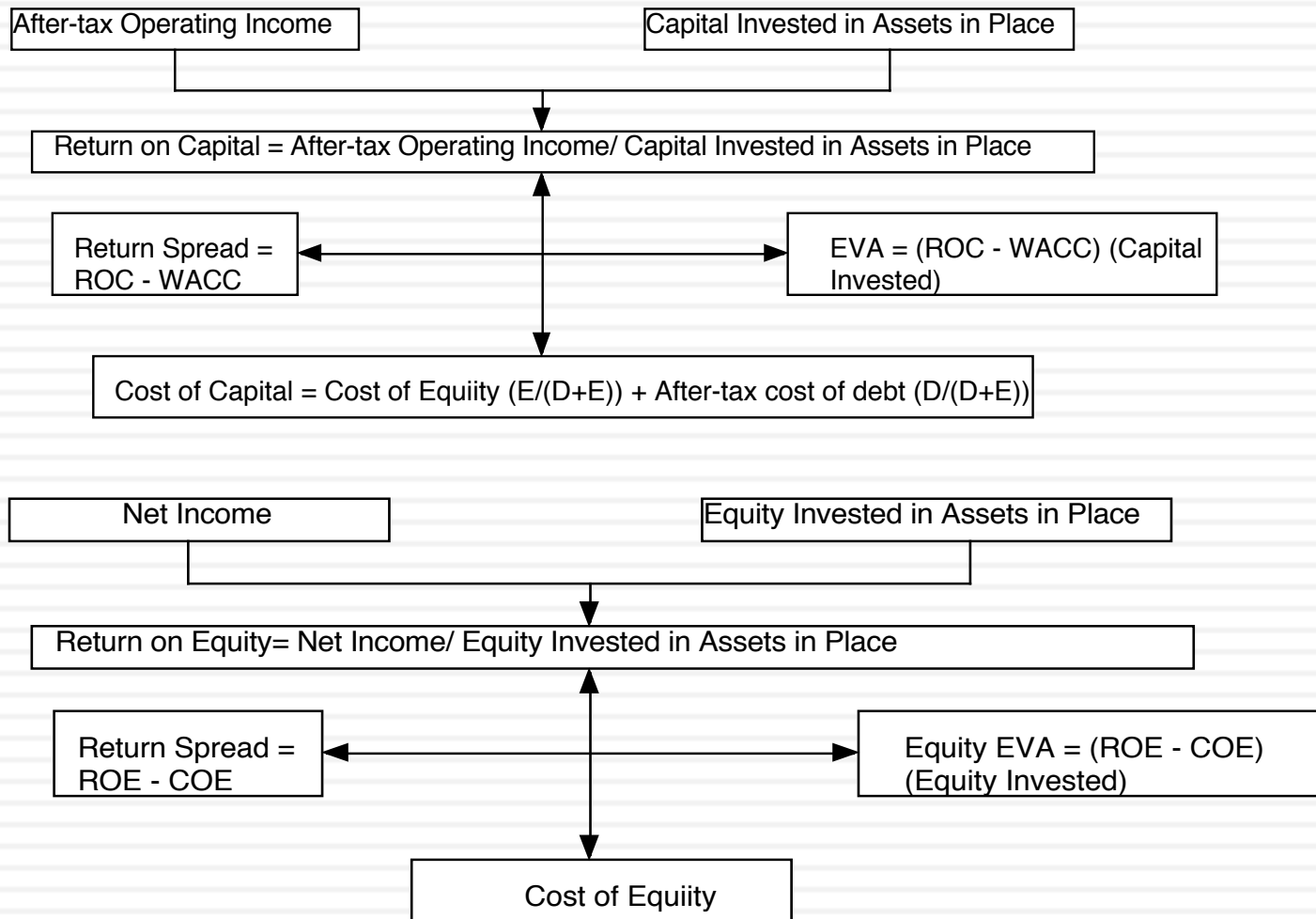
Cost of Capital



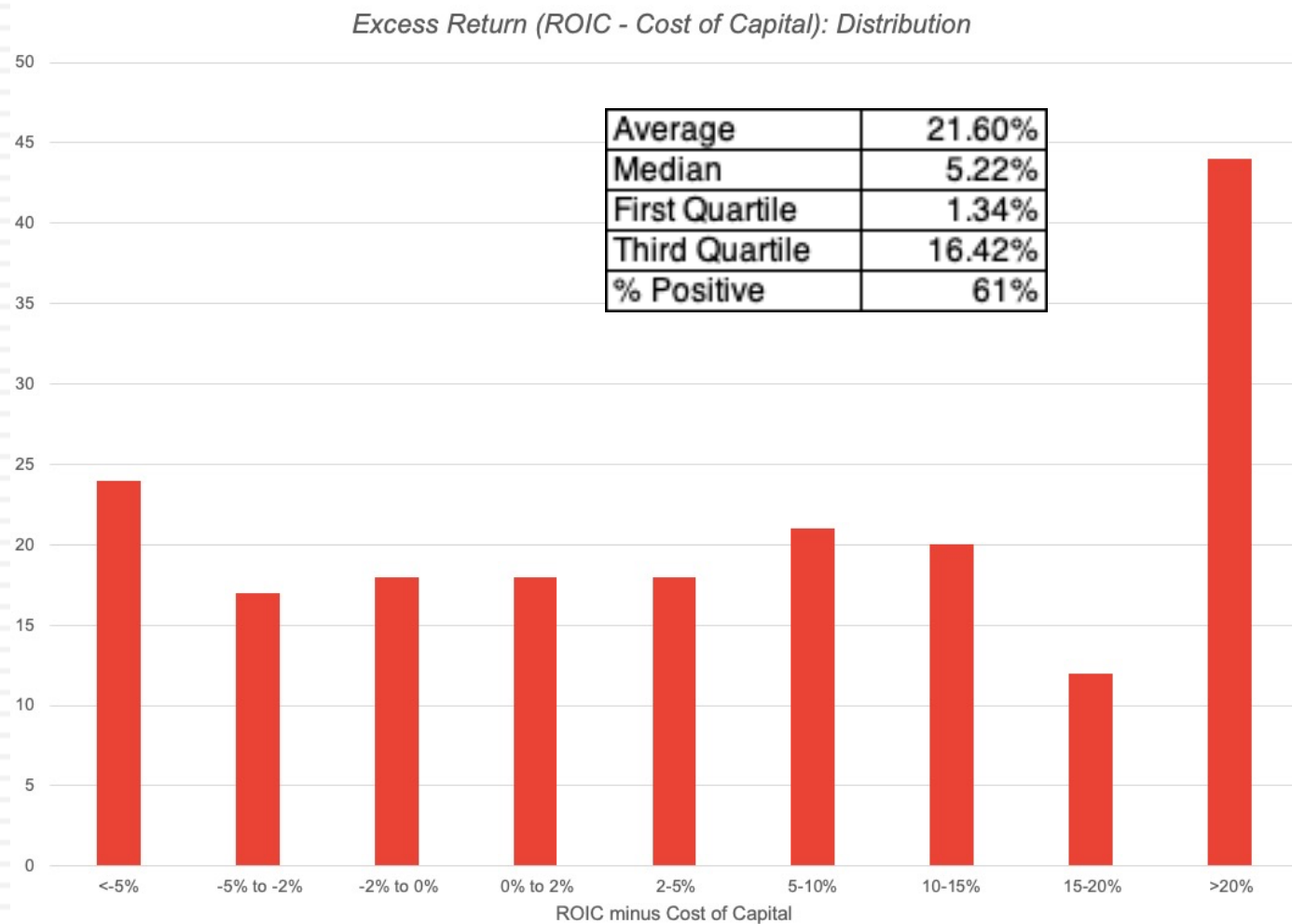
Distribution of Current Market Value Debt Ratios



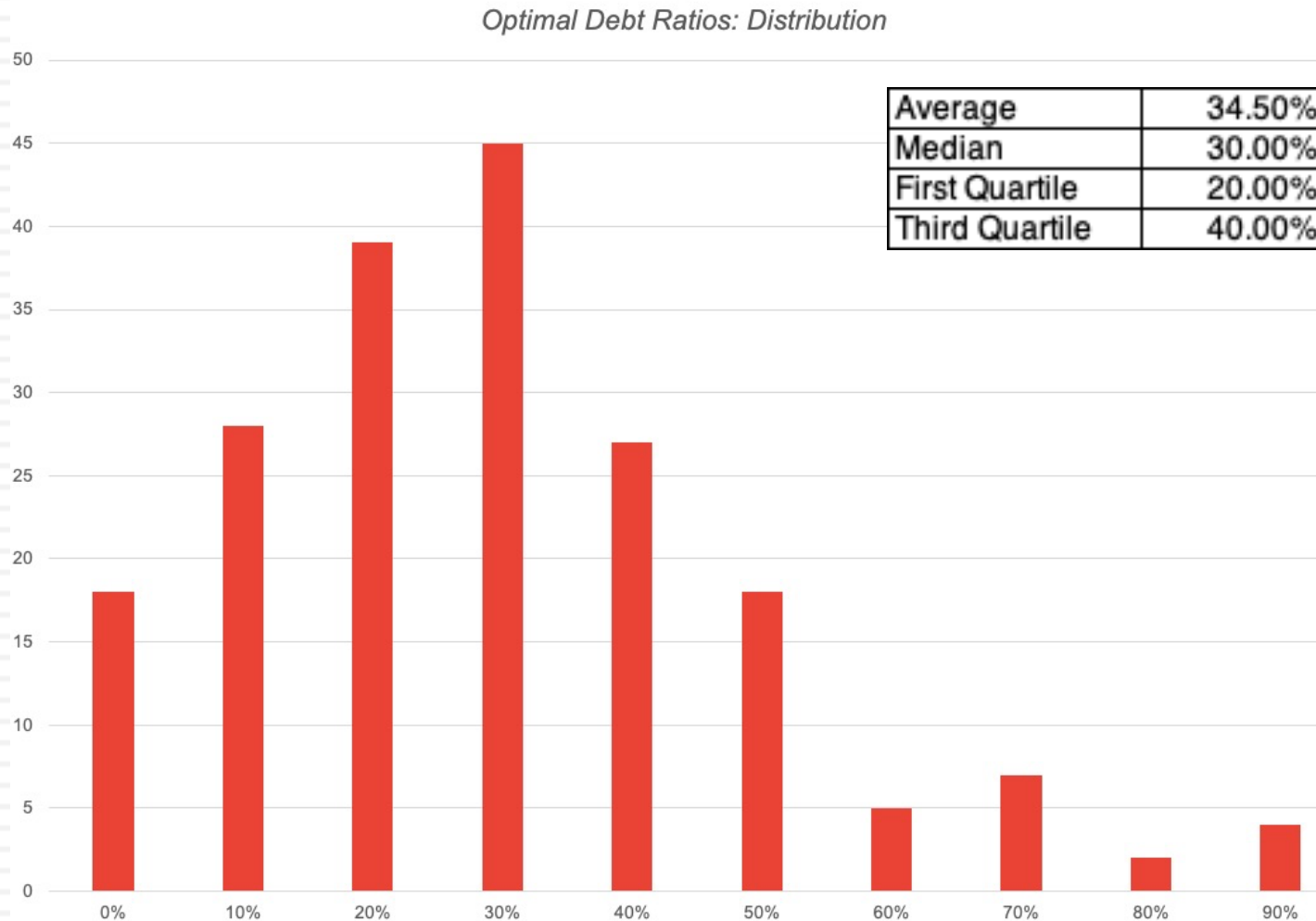
IV. The Quality of Investments: The Firm View



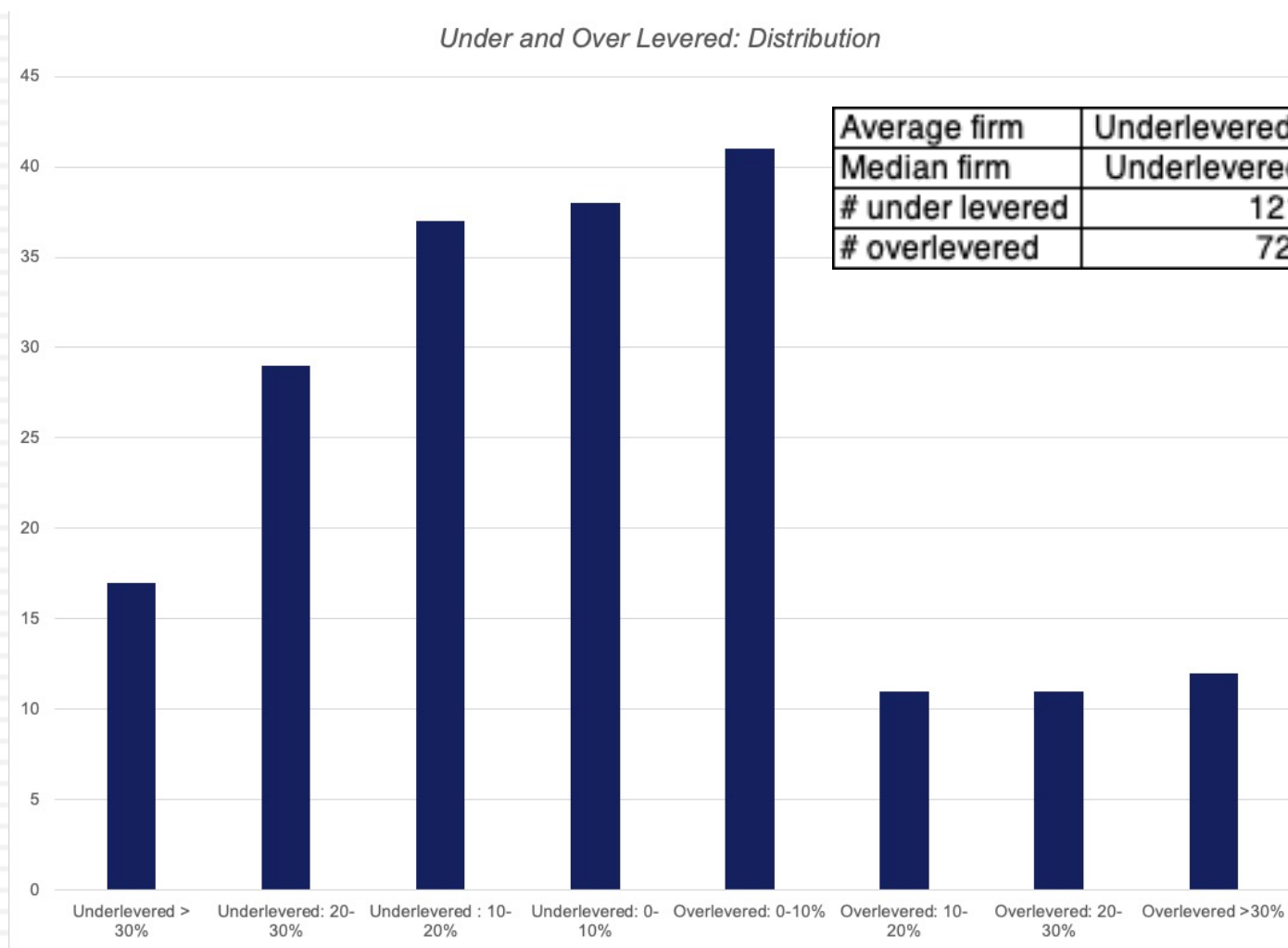
Return Spreads



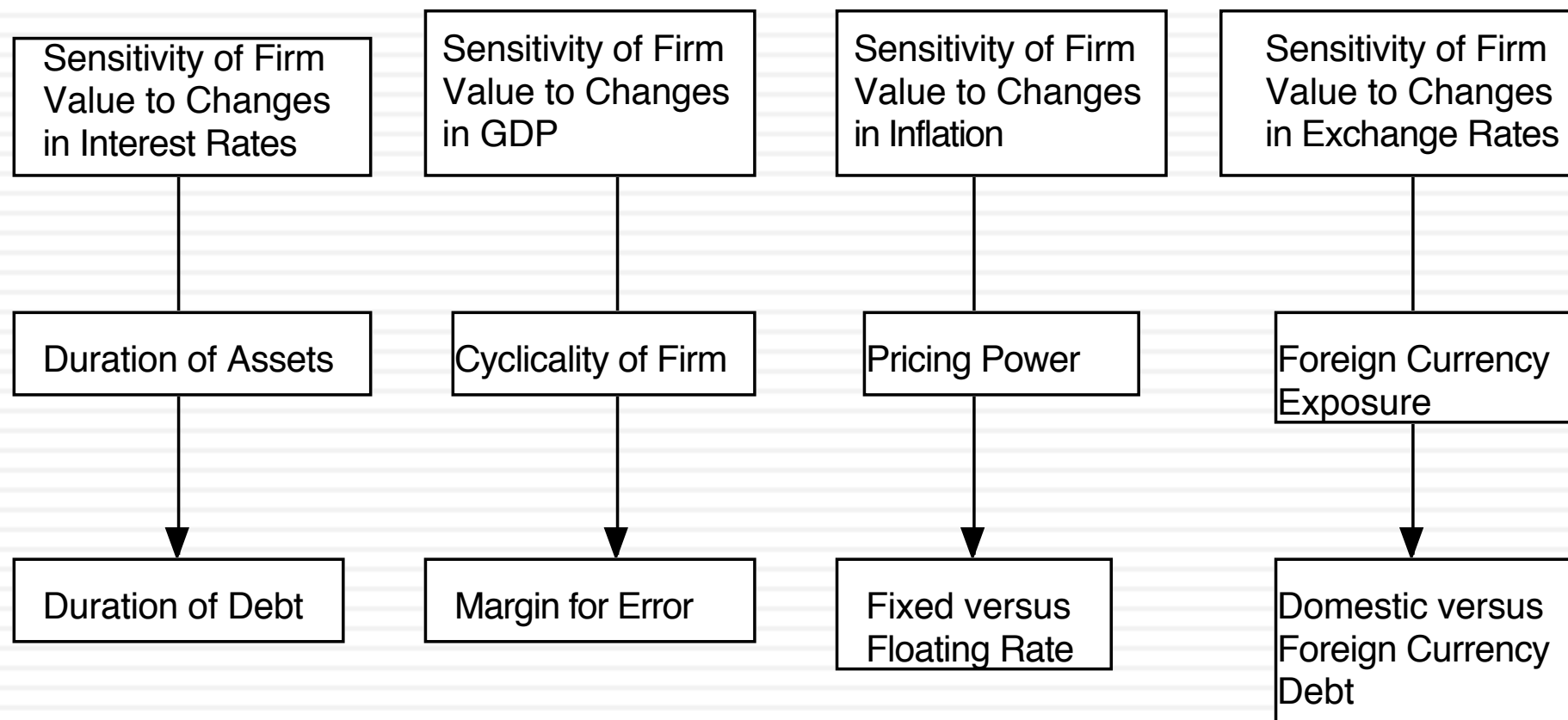
VI. The Optimal Financing Mix



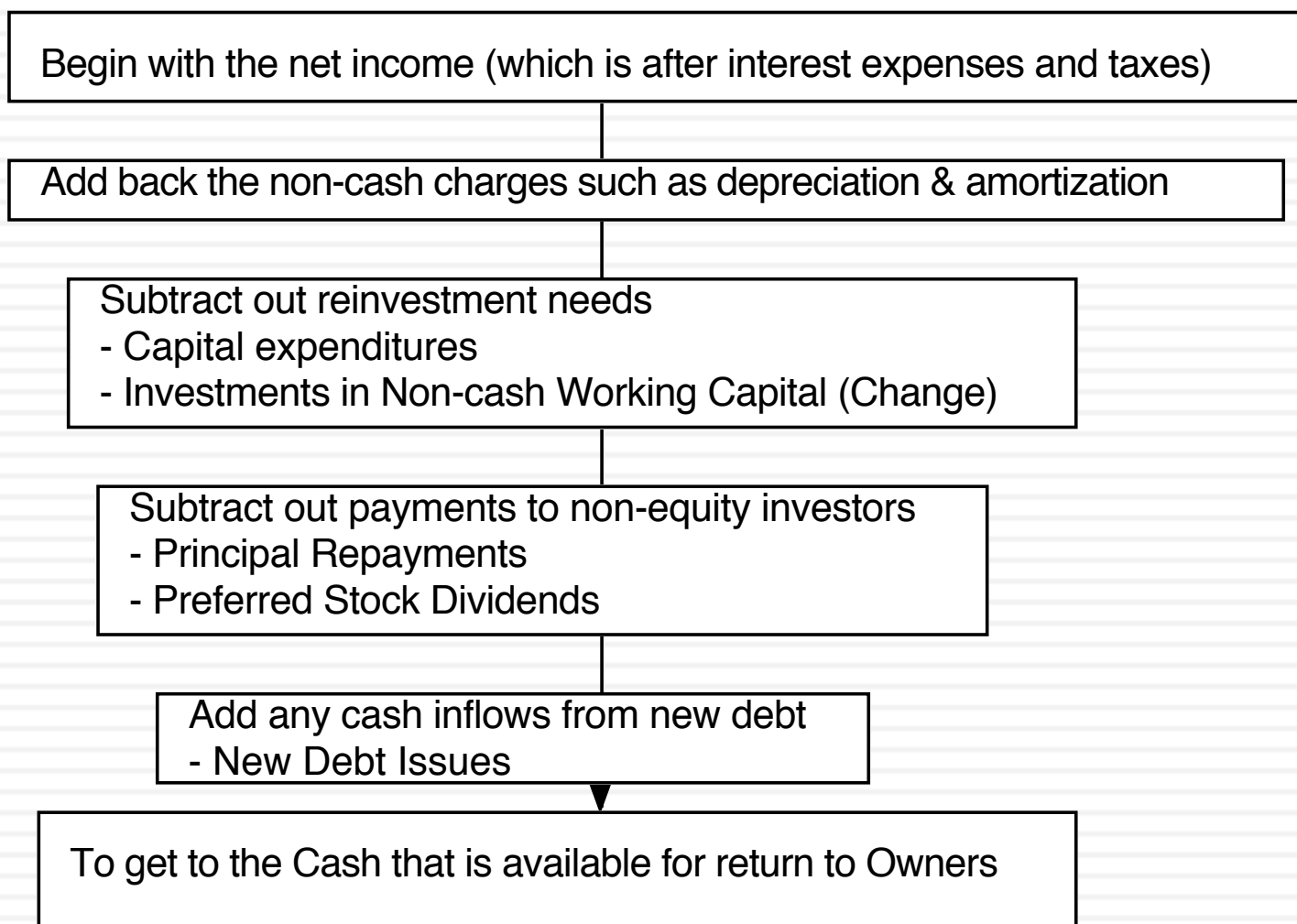
Under versus Over Levered Firms



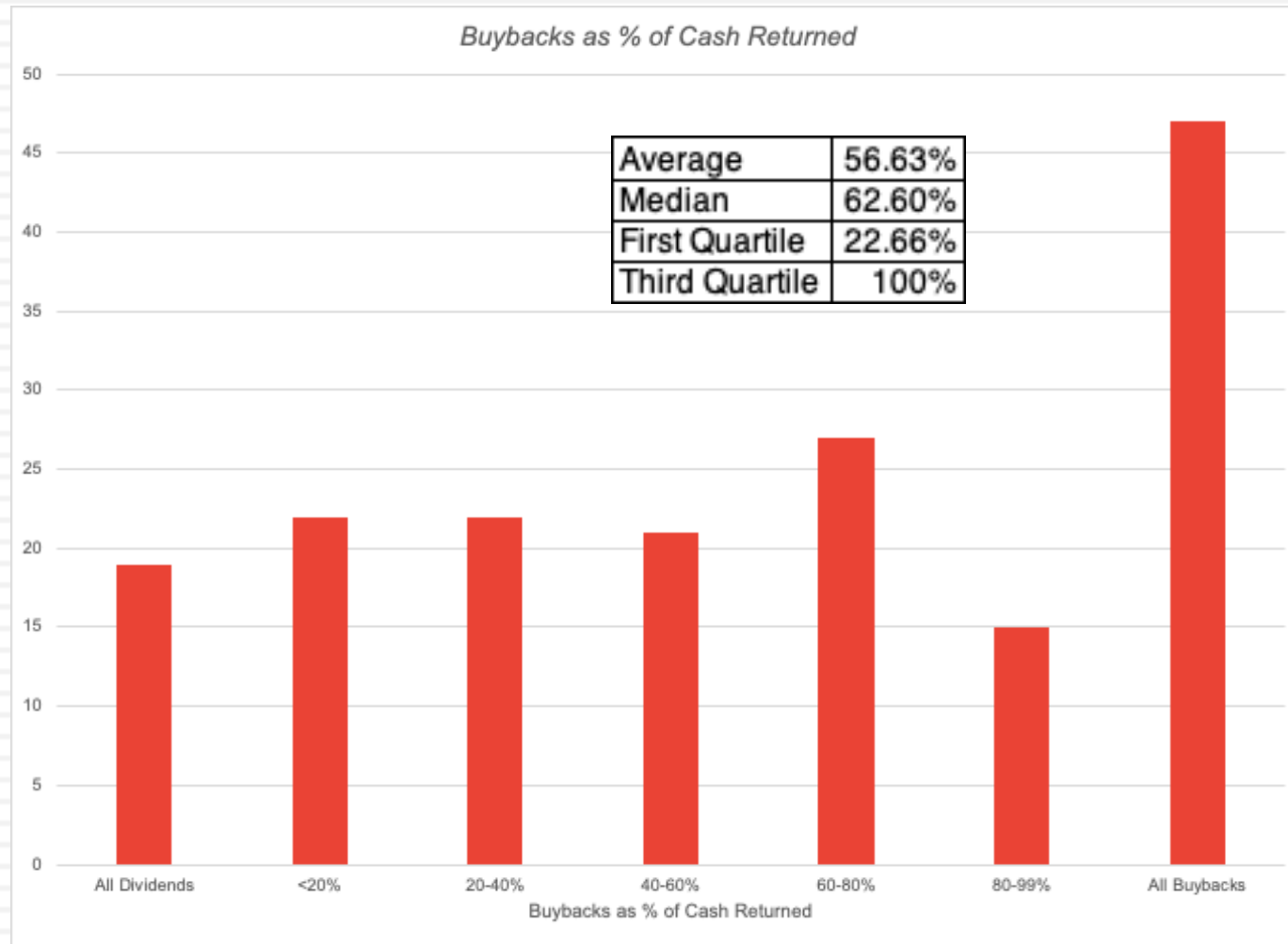
VIII. The Right Kind of Financing



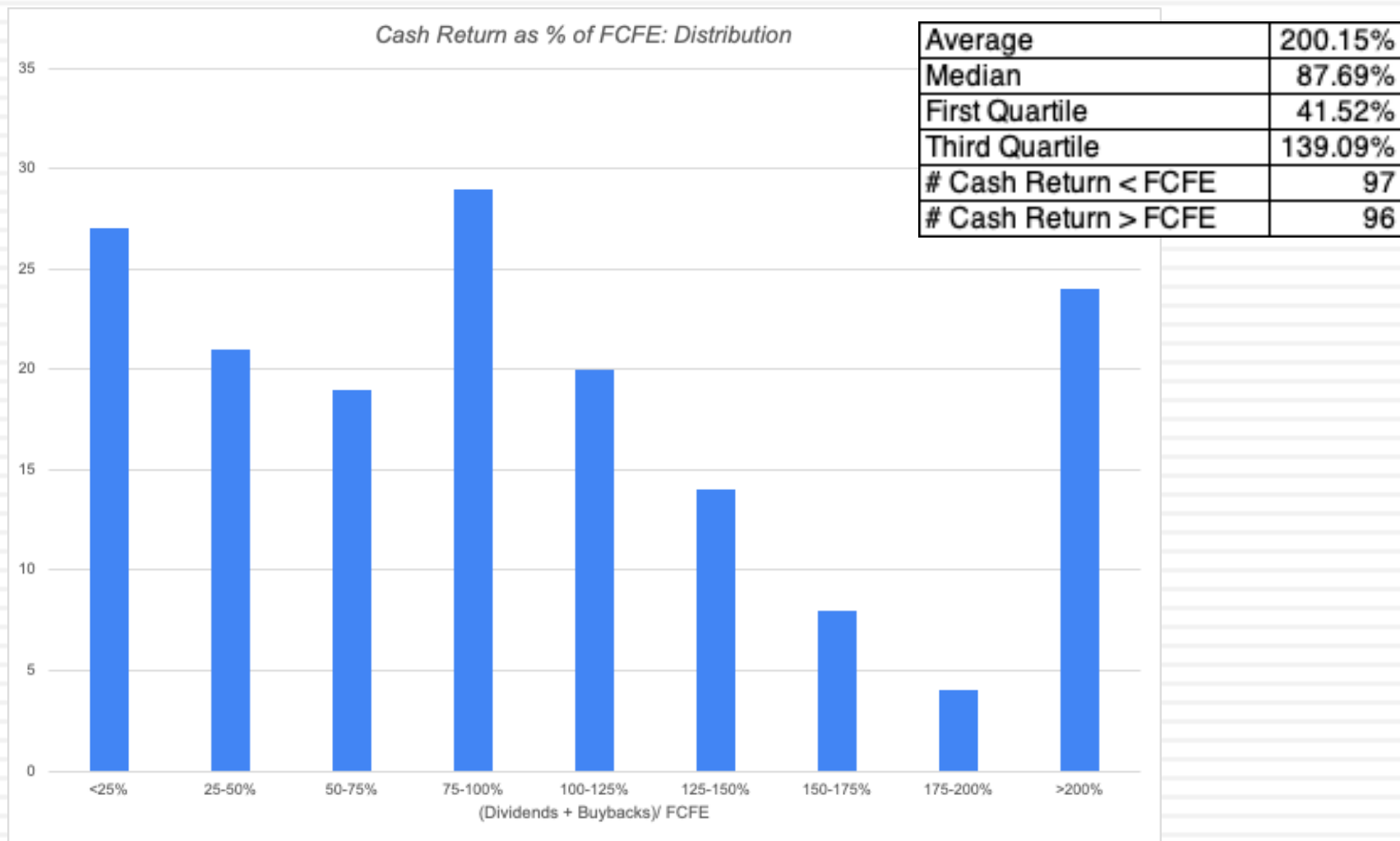
IX. Measuring Potential Dividends



Dividends versus Buybacks

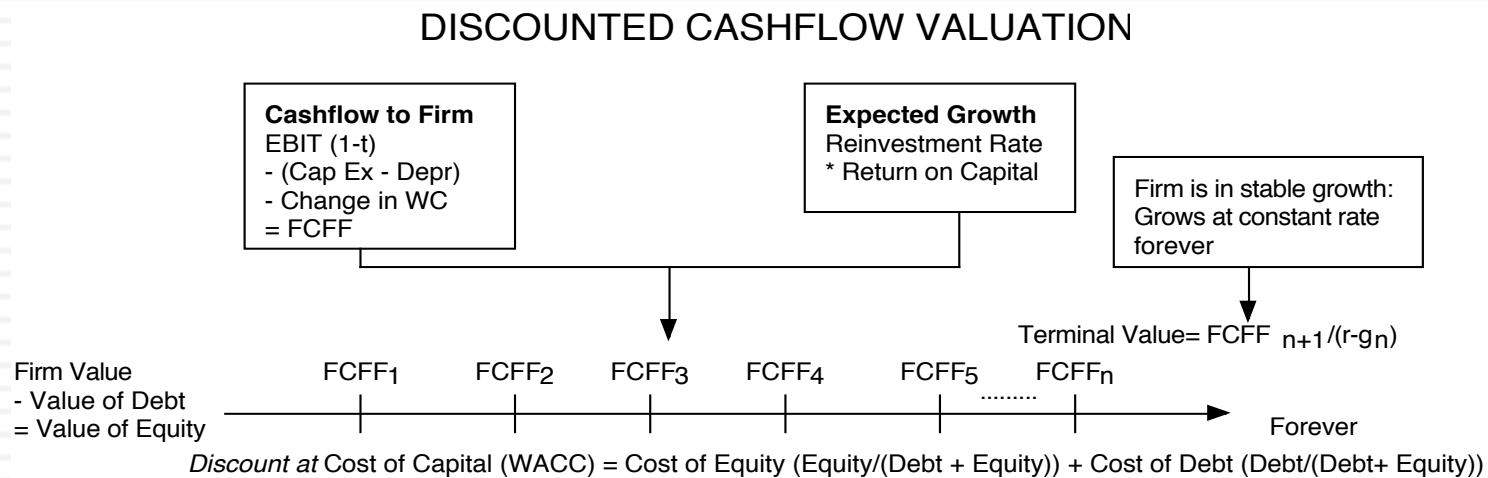
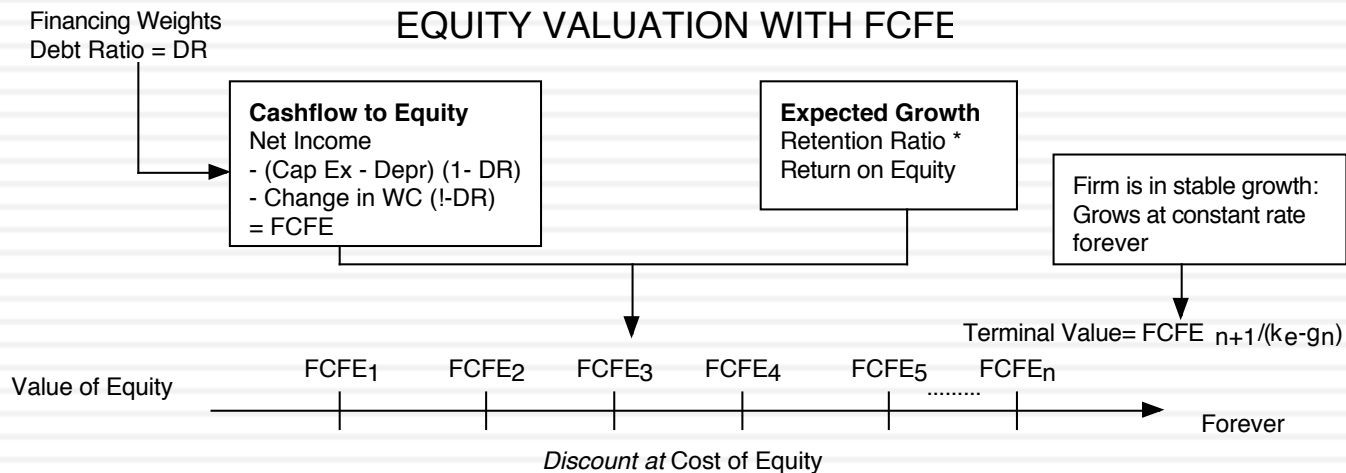


Cash Return versus FCFE



X. Valuation:

Match up cashflows and discount rates...



From firm value to equity value per share

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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} &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} $

Valuing Deutsche Bank in early 2008

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- To value Deutsche Bank, we started with the normalized income over the previous five years (3,954 million Euros) and the dividends in 2008 (2,146 million Euros). We assumed that the payout ratio and ROE, based on these numbers will continue for the next 5 years:
 - ▣ Payout ratio = $2,146/3954 = 54.28\%$
 - ▣ Expected growth rate = $(1-.5428) * .1181 = 0.054$ or 5.4%
 - ▣ Cost of equity = 9.23%

<i>Year</i>	<i>Net Income</i>	<i>Payout Ratio</i>	<i>Dividends</i>	<i>PV @ 9.23%</i>
2008	4,167 €	54.28%	2,262 €	2,071 €
2009	4,392 €	54.28%	2,384 €	1,998 €
2010	4,629 €	54.28%	2,513 €	1,928 €
2011	4,879 €	54.28%	2,648 €	1,861 €
2012	5,143 €	54.28%	2,791 €	1,795 €
				9,653 €

Deutsche Bank in stable growth

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- At the end of year 5, the firm is in stable growth. We assume that the cost of equity drops to 8.5% (as the beta moves to 1) and that the return on equity also drops to 8.5 (to equal the cost of equity).

Stable Period Payout Ratio = $1 - g/\text{ROE} = 1 - 0.03/0.085 = 0.6471$ or 64.71%

Expected Dividends in Year 6 = Expected Net Income₅ * (1+g_{Stable}) * Stable Payout Ratio
 = €5,143 (1.03) * 0.6471 = €3,427 million

Terminal Value = $\frac{\text{Expected Dividends}_6}{(\text{Cost of Equity}-g)} = \frac{3,427}{(.085-.03)} = 62,318$ million Euros

PV of Terminal Value = $\frac{\text{Terminal Value}_n}{(1+\text{Cost of Equity}_{\text{High growth}})^n} = \frac{62,318}{(1.0923)^5} = 40,079$ mil Euros

- Value of equity = €9,653 + €40,079 = €49,732 million Euros
- Value of equity per share = $\frac{\text{Value of Equity}}{\# \text{ Shares}} = \frac{49,732}{474.2} = 104.88$ Euros/share

Stock was trading at 89 Euros per share at the time of the analysis.

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 = $g / \text{ROC} = 2.5 / 10 = 25\%$
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%

Estimating Stable Period Inputs after a high growth period: 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%
 - $\text{Cost of capital} = 8.51\% (.80) + 3.75\% (1-.361) (.20) = 7.29\%$

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

$g = 2.75\%$; 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 = $7,980 / (.0729 - .025) = 165,323$

	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
 10,639
 2,660
 7,980

Op. Assets 125,477
 + Cash: 3,931
 + Non op inv 2,849
 - Debt 15,961
 - Minority Int 2,721
 $= Equity$ 113,575
 - Options 972
Value/Share \$ 62.56

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

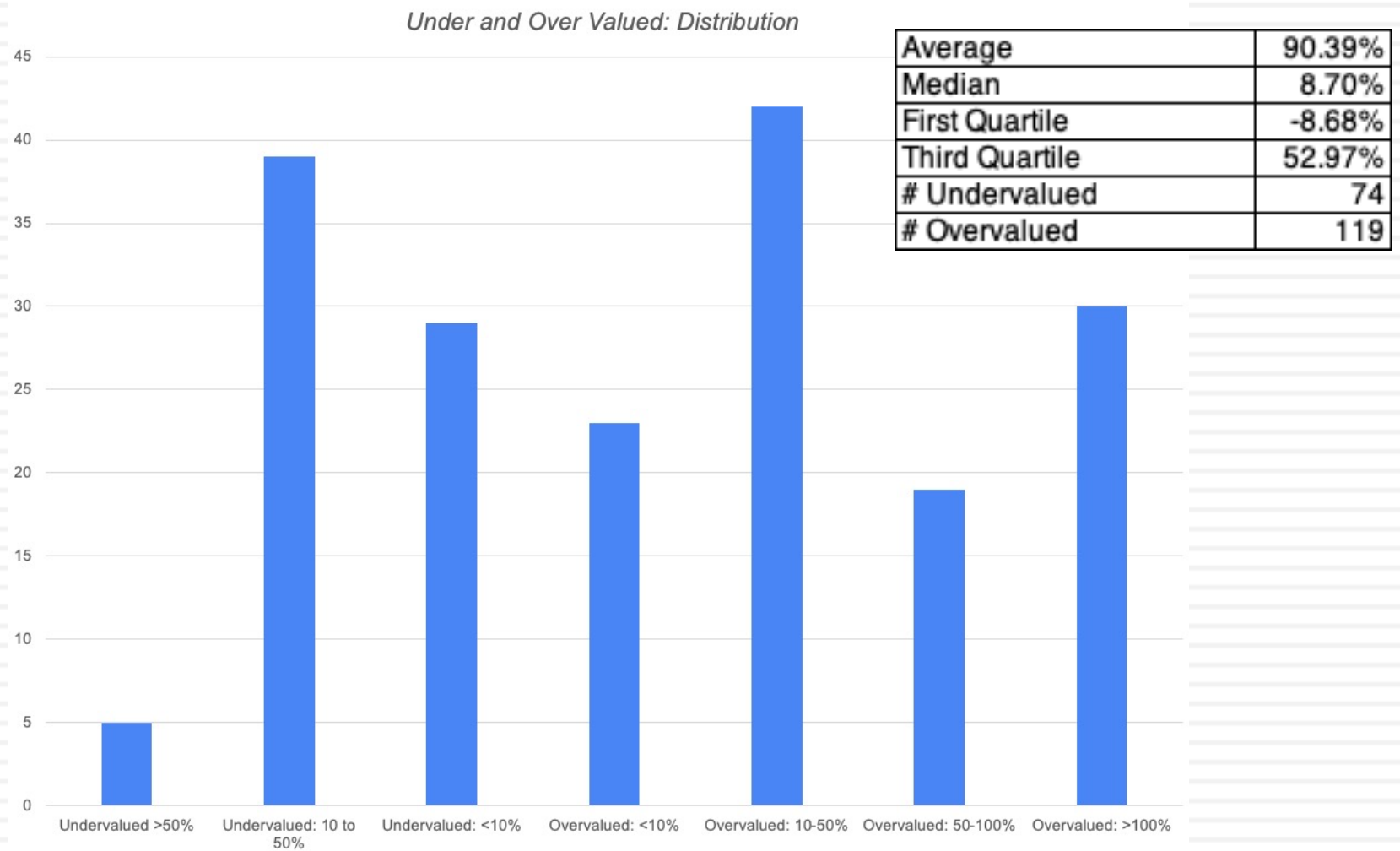
x

ERP for operations
 5.76%

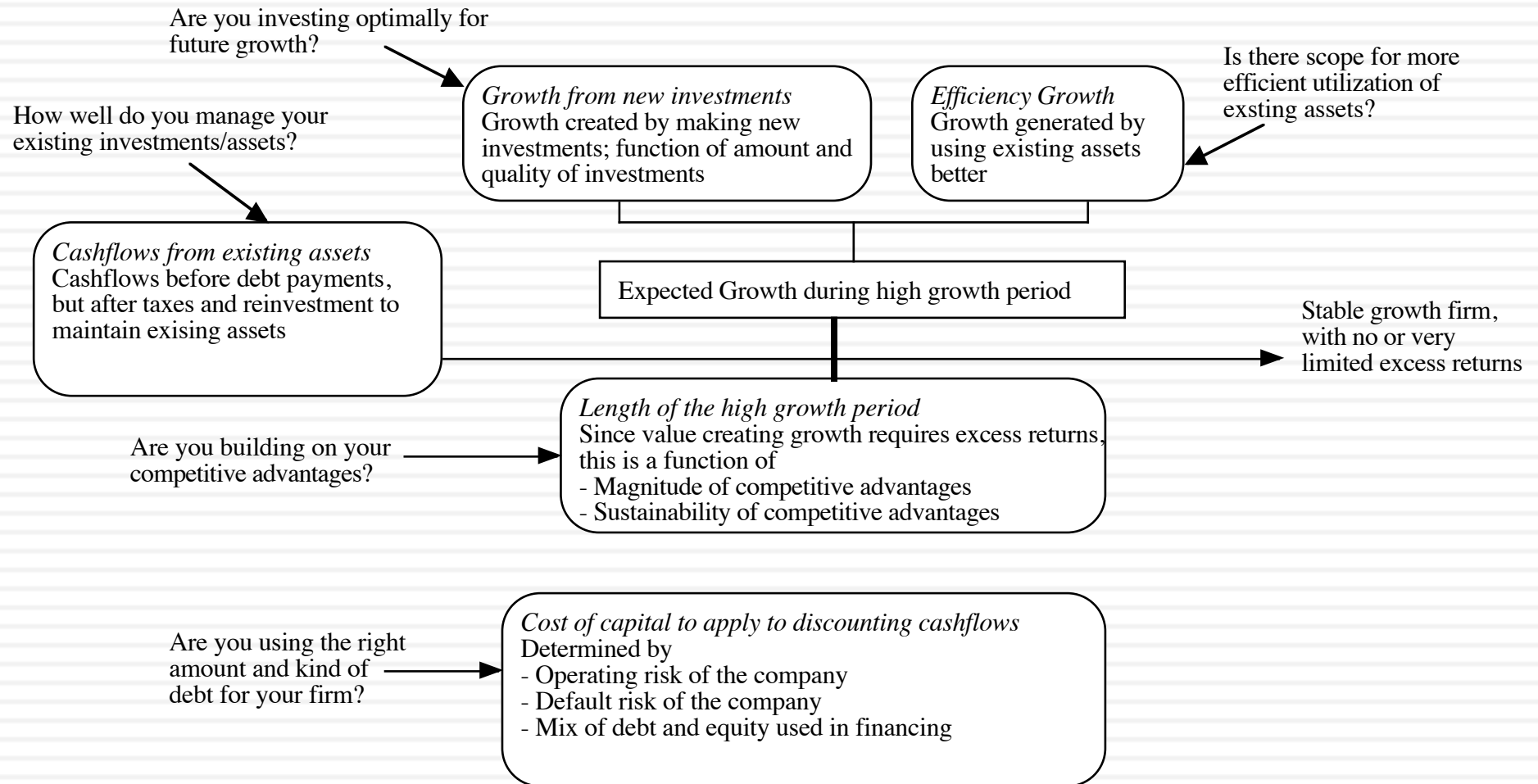
Unlevered Beta for
 Sectors: 0.9239

D/E = 13.10%

Under and Over Valued: Your findings



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

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

First 5 years

Growth declines gradually to 2.75%

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

	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

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

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

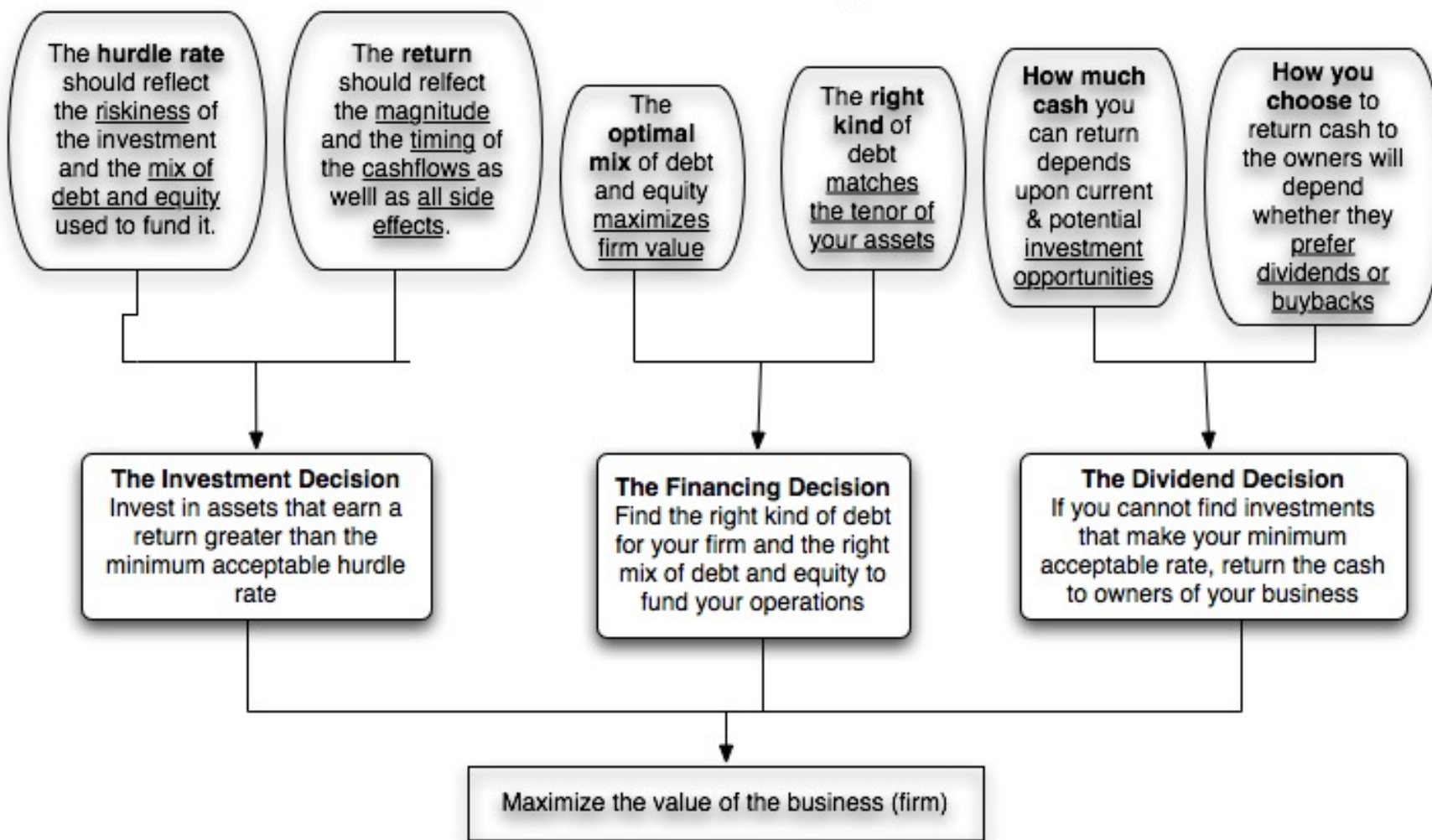
$D/E = 66.67\%$

The Triple Whammy: Under levered , Cash Build-up and Under valued, all by at least 10%

<i>Company picked for project</i>	<i>Corporate Governance Measure (0-2)</i>	<i>Debt to Capital Ratio</i>	<i>Cost of Capital (%)</i>	<i>Return on Capital</i>	<i>Optimal Debt Ratio (%)</i>	<i>Dividends in most recent periods (Total \$)</i>	<i>Buybacks in most recent periods (Total \$)</i>	<i>FCFE in most recent periods (Total \$)</i>	<i>Price per share (\$)</i>	<i>Value per share (\$)</i>
Tractor Supply Company	2.00	14.8%	8.42%	16.84%	40.00%	\$449.60	\$618.60	\$1,447	\$250.19	\$380.73
Costco	2.00	2.6%	8.53%	30.33%	20.00%	\$1,251	\$979	\$5,376	\$726	\$985
Under Armour	1.50	32.6%	9.95%	17.81%	50.00%	0	425	\$1,343.92	6.74	9.66
Adobe	1.50	1.5%	12.07%	45.36%	30.00%	0	\$5,647	\$6,442	\$477.56	\$587.02
Johnson & Johnson	1.50	6.7%	7.21%	23.39%	40.00%	\$11,770	\$6,035.00	\$26,096.00	\$149.27	\$186.21
Smith & Wesson (SWBI)	1.50	10.9%	8.97%	10.05%	40.00%	\$62.60	\$209.10	482.9	\$17.15	20.78
Under Armour	1.50	33.1%	9.41%	23.80%	50.00%	0	\$81.70	\$242.40	\$6.74	\$8.56
Adobe	1.50	1.7%	12.02%	23%	20.00%	0	\$5,647	\$6,611	\$477.52	\$750.22
Anheuser Busch InBev	1.00	43.4%	9.88%	9.30%	60.00%	1395.99	1000	5226	\$59.97	\$71.49
Pioneer Natural Resources	0.50	9.0%	4.87%	16.80%	80.00%	2,580	184	\$8,362	\$267.66	\$314.69
Fast Retailing Co Ltd	1.00	3.5%	6.88%	61%	30.00%	73,064	0	307,000	40,820	55000
lululemon	1.50	2.6%	10.15%	39.84%	20.00%	\$0.00	\$1,009.40	\$1,988.30	\$360	\$404.61

First Principles

Corporate Finance: The Big Picture



Objectives of this class

- Elevate: If you get the big picture, the details will come (sooner or later)
- Apply: Tools are useful but only in the larger context of answering bigger questions.
- Aha Insight: Corporate finance is not so ba