

The cost of capital approach suggests that Disney should do the following...

- Disney currently has \$15.96 billion in debt. The optimal dollar debt (at 40%) is roughly \$55.1 billion. Disney has excess debt capacity of 39.14 billion.
- To move to its optimal and gain the increase in value, Disney should borrow \$ 39.14 billion and buy back stock.
- Given the magnitude of this decision, you should expect to answer three questions:
 - ▣ Why should we do it?
 - ▣ What if something goes wrong?
 - ▣ What if we don't want (or cannot) buy back stock and want to make investments with the additional debt capacity?

I. Why should we do this?

- In this approach, we start with the current market value and isolate the effect of changing the capital structure on the cash flow and the resulting value.

Enterprise Value before the change = \$133,908 million

Cost of financing Disney at existing debt ratio = \$ 133,908 * 0.0781 = \$10,458 million

Cost of financing Disney at optimal debt ratio = \$ 133,908 * 0.0716 = \$ 9,592 million

Annual savings in cost of financing = \$10,458 million – \$9,592 million = \$866 million

$$\text{Increase in Value} = \frac{\text{Annual Savings next year}}{(\text{Cost of Capital} - g)} = \frac{\$866}{(0.0716 - 0.0275)} = \$19,623 \text{ million}$$

Enterprise value after recapitalization

= Existing enterprise value + PV of Savings = \$133,908 + \$19,623 = \$153,531 million

2. What if something goes wrong?

The Downside Risk

- Doing What-if analysis on Operating Income
 - A. Statistical Approach
 - Standard Deviation In Past Operating Income
 - Reduce Base Case By One Standard Deviation (Or More)
 - B. “Economic Scenario” Approach
 - Look At What Happened To Operating Income During The Last Recession. (How Much Did It Drop In % Terms?)
 - Reduce Current Operating Income By Same Magnitude
- Constraint on Bond Ratings

Disney's Operating Income: History

<i>Year</i>	<i>EBIT</i>	<i>% Change in EBIT</i>	<i>Year</i>	<i>EBIT</i>	<i>% Change in EBIT</i>
1987	\$756		2001	\$2,832	12.16%
1988	\$848	12.17%	2002	\$2,384	-15.82%
1989	\$1,177	38.80%	2003	\$2,713	13.80%
1990	\$1,368	16.23%	2004	\$4,048	49.21%
1991	\$1,124	-17.84%	2005	\$4,107	1.46%
1992	\$1,287	14.50%	2006	\$5,355	30.39%
1993	\$1,560	21.21%	2007	\$6,829	27.53%
1994	\$1,804	15.64%	2008	\$7,404	8.42%
1995	\$2,262	25.39%	2009	\$5,697	-23.06%
1996	\$3,024	33.69%	2010	\$6,726	18.06%
1997	\$3,945	30.46%	2011	\$7,781	15.69%
1998	\$3,843	-2.59%	2012	\$8,863	13.91%
1999	\$3,580	-6.84%	2013	\$9,450	6.62%
2000	\$2,525	-29.47%			

Standard deviation in %
change in EBIT = 19.17%

Recession Decline in Operating Income

2009	Drop of 23.06%
2002	Drop of 15.82%
1991	Drop of 22.00%
1981-82	Increased by 12%
Worst Year	Drop of 29.47%

Disney: Safety Buffers?

EBIT drops by	EBIT	Optimal Debt ratio
0%	\$10,032	40%
10%	\$9,029	40%
20%	\$8,025	40%
30%	\$7,022	40%
40%	\$6,019	30%
50%	\$5,016	30%
60%	\$4,013	20%

Constraints on Ratings

- Management often specifies a 'desired rating' below which they do not want to fall.
- The rating constraint is driven by three factors
 - ▣ it is one way of protecting against downside risk in operating income (so do not do both)
 - ▣ a drop in ratings might affect operating income
 - ▣ there is an ego factor associated with high ratings
- Caveat: Every rating constraint has a cost.
 - ▣ The cost of a rating constraint is the difference between the unconstrained value and the value of the firm with the constraint.
 - ▣ Managers need to be made aware of the costs of the constraints they impose.

Ratings Constraints for Disney

- At its optimal debt ratio of 40%, Disney has an estimated rating of A.
- If managers insisted on a AA rating, the optimal debt ratio for Disney is then 30% and the cost of the ratings constraint is fairly small:

Cost of AA Rating Constraint = Value at 40% Debt – Value at 30% Debt = \$153,531 m – \$147,835 m = \$ 5,696 million

- If managers insisted on a AAA rating, the optimal debt ratio would drop to 20% and the cost of the ratings constraint would rise:

Cost of AAA rating constraint = Value at 40% Debt – Value at 20% Debt = \$153,531 m – \$141,406 m = \$ 12,125 million

3. What if you do not buy back stock..

- The optimal debt ratio is ultimately a function of the underlying riskiness of the business in which you operate and your tax rate.
- Will the optimal be different if you invested in projects instead of buying back stock?
 - No. As long as the projects financed are in the same business mix that the company has always been in and your tax rate does not change significantly.
 - Yes, if the projects are in entirely different types of businesses or if the tax rate is significantly different.

Extension to a family group company: Tata Motor's Optimal Capital Structure

Debt Ratio	Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Enterprise Value
0%	0.8601	12.76%	Aaa/AAA	9.22%	32.45%	6.23%	12.76%	1,286,997₹
10%	0.9247	13.22%	Aa2/AA	9.52%	32.45%	6.43%	12.54%	1,333,263₹
20%	1.0054	13.80%	A3/A-	10.12%	32.45%	6.84%	12.41%	1,363,774₹
30%	1.1092	14.55%	B2/B	15.32%	32.45%	10.35%	13.29%	1,185,172₹
40%	1.2475	15.54%	Caa/CCC	17.57%	32.45%	11.87%	14.07%	1,061,143₹
50%	1.4412	16.93%	Ca2/CC	18.32%	32.45%	12.38%	14.65%	984,693₹
60%	1.7610	19.23%	Ca2/CC	18.32%	30.18%	12.79%	15.37%	904,764₹
70%	2.3749	23.65%	C2/C	19.32%	24.53%	14.58%	17.30%	741,800₹
80%	3.5624	32.19%	C2/C	19.32%	21.46%	15.17%	18.58%	663,028₹
90%	7.1247	57.81%	C2/C	19.32%	19.08%	15.63%	19.85%	599,379₹

Tata Motors looks like it is over levered (29% actual versus 20% optimal), perhaps because it is drawing on the debt capacity of other companies in the Tata Group.

Extension to a firm with volatile earnings: Vale's Optimal Debt Ratio

Debt Ratio	Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Enterprise Value
0%	0.8440	8.97%	Aaa/AAA	5.15%	34.00%	3.40%	8.97%	\$98,306
10%	0.9059	9.43%	Aaa/AAA	5.15%	34.00%	3.40%	8.83%	\$100,680
20%	0.9833	10.00%	Aaa/AAA	5.15%	34.00%	3.40%	8.68%	\$103,171
30%	1.0827	10.74%	A1/A+	5.60%	34.00%	3.70%	8.62%	\$104,183
40%	1.2154	11.71%	A3/A-	6.05%	34.00%	3.99%	8.63%	\$104,152
50%	1.4011	13.08%	B1/B+	10.25%	34.00%	6.77%	9.92%	\$85,298
60%	1.6796	15.14%	B3/B-	12.00%	34.00%	7.92%	10.81%	\$75,951
70%	2.1438	18.56%	B3/B-	12.00%	34.00%	7.92%	11.11%	\$73,178
80%	3.0722	25.41%	Ca2/CC	14.25%	34.00%	9.41%	12.61%	\$62,090
90%	5.8574	45.95%	Ca2/CC	14.25%	34.00%	9.41%	13.06%	\$59,356

	Last 12 months	-1	-2	-3	Average
Revenues	\$48,469	\$48,058	\$61,123	\$47,343	\$51,248
EBITDA	\$19,861	\$17,662	\$34,183	\$26,299	\$24,501
EBIT	\$15,487	\$13,346	\$30,206	\$23,033	\$20,518
Pre-tax operating margin	31.95%	27.77%	49.42%	48.65%	39.45%

Replacing Vale's current operating income with the average over the last three years pushes up the optimal to 50%.

Optimal Debt Ratio for a young, growth firm: Baidu

Debt Ratio	Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Enterprise Value
0%	1.3021	12.54%	Aaa/AAA	4.70%	25.00%	3.53%	12.54%	\$337,694
10%	1.4106	13.29%	A3/A-	5.60%	25.00%	4.20%	12.38%	\$343,623
20%	1.5463	14.23%	Ca2/CC	13.80%	25.00%	10.35%	13.45%	\$306,548
30%	1.7632	15.74%	Caa/CCC	14.80%	17.38%	12.23%	14.68%	\$272,853
40%	2.0675	17.85%	D2/D	16.30%	11.83%	14.37%	16.46%	\$235,510
50%	2.4810	20.72%	D2/D	16.30%	9.47%	14.76%	17.74%	\$214,337
60%	3.1012	25.02%	D2/D	16.30%	7.89%	15.01%	19.02%	\$196,657
70%	4.1350	32.20%	D2/D	16.30%	6.76%	15.20%	20.30%	\$181,672
80%	6.2024	46.54%	D2/D	16.30%	5.92%	15.34%	21.58%	\$168,808
90%	12.4049	89.59%	D2/D	16.30%	5.26%	15.44%	22.86%	\$157,646

The optimal debt ratio for Baidu is between 0 and 10%, close to its current debt ratio of 5.23%, and much lower than the optimal debt ratios computed for Disney, Vale and Tata Motors.

Extension to a private business

Optimal Debt Ratio for Bookscape

Debt value of leases = \$12,136 million (only debt)

Estimated market value of equity = Net Income * Average PE for Publicly Traded Book

Retailers = $1.575 * 20 = \$31.5$ million

Debt ratio = $12,136 / (12,136 + 31,500) = 27.81\%$

Debt Ratio	Total Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Enterprise Value
0%	1.3632	10.25%	Aaa/AAA	3.15%	40.00%	1.89%	10.25%	\$37,387
10%	1.4540	10.75%	Aaa/AAA	3.15%	40.00%	1.89%	9.86%	\$39,416
20%	1.5676	11.37%	A1/A+	3.60%	40.00%	2.16%	9.53%	\$41,345
30%	1.7137	12.18%	A3/A-	4.05%	40.00%	2.43%	9.25%	\$43,112
40%	1.9084	13.25%	Caa/CCC	11.50%	40.00%	6.90%	10.71%	\$35,224
50%	2.2089	14.90%	Ca2/CC	12.25%	37.96%	7.60%	11.25%	\$32,979
60%	2.8099	18.20%	C2/C	13.25%	29.25%	9.37%	12.91%	\$27,598
70%	3.7466	23.36%	C2/C	13.25%	25.07%	9.93%	13.96%	\$25,012
80%	5.6198	33.66%	C2/C	13.25%	21.93%	10.34%	15.01%	\$22,869
90%	11.4829	65.91%	D2/D	14.75%	17.51%	12.17%	17.54%	\$18,952

The firm value is maximized (and the cost of capital is minimized) at a debt ratio of 30%. At its existing debt ratio of 27.81%, Bookscape is at its optimal.

Capital Structure for a bank: An Alternative Approach

- Consider a bank with \$ 100 million in loans outstanding and a book value of equity of \$ 6 million. Furthermore, assume that the regulatory requirement is that equity capital be maintained at 5% of loans outstanding. Finally, assume that this bank wants to increase its loan base by \$ 50 million to \$ 150 million and to augment its equity capital ratio to 7% of loans outstanding.

Loans outstanding after Expansion		= \$ 150 million
Equity after expansion	= 7% of \$150	= \$10.5 million
Existing Equity		= \$ 6.0 million
New Equity needed		= \$ 4.5 million

- Your need for “external” equity as a bank/financial service company will depend upon
 - a. Your growth rate: Higher growth -> More external equity
 - b. Existing capitalization vs Target capitalization: Under capitalized -> More external equity
 - c. Current earnings: Less earnings -> More external equity
 - d. Current dividends: More dividends -> More external equity

Determinants of the Optimal Debt Ratio:

1. The marginal tax rate

- The primary benefit of debt is a tax benefit. The higher the marginal tax rate, the greater the benefit to borrowing:

Tax Rate	Disney	Vale	Tata Motors	Baidu	Bookscape
0%	0%	0%	0%	0%	0%
10%	20%	0%	0%	0%	10%
20%	40%	0%	10%	10%	30%
30%	40%	30%	20%	10%	30%
40%	40%	40%	20%	10%	30%
50%	40%	40%	20%	10%	30%

2. Pre-tax Cash flow Return

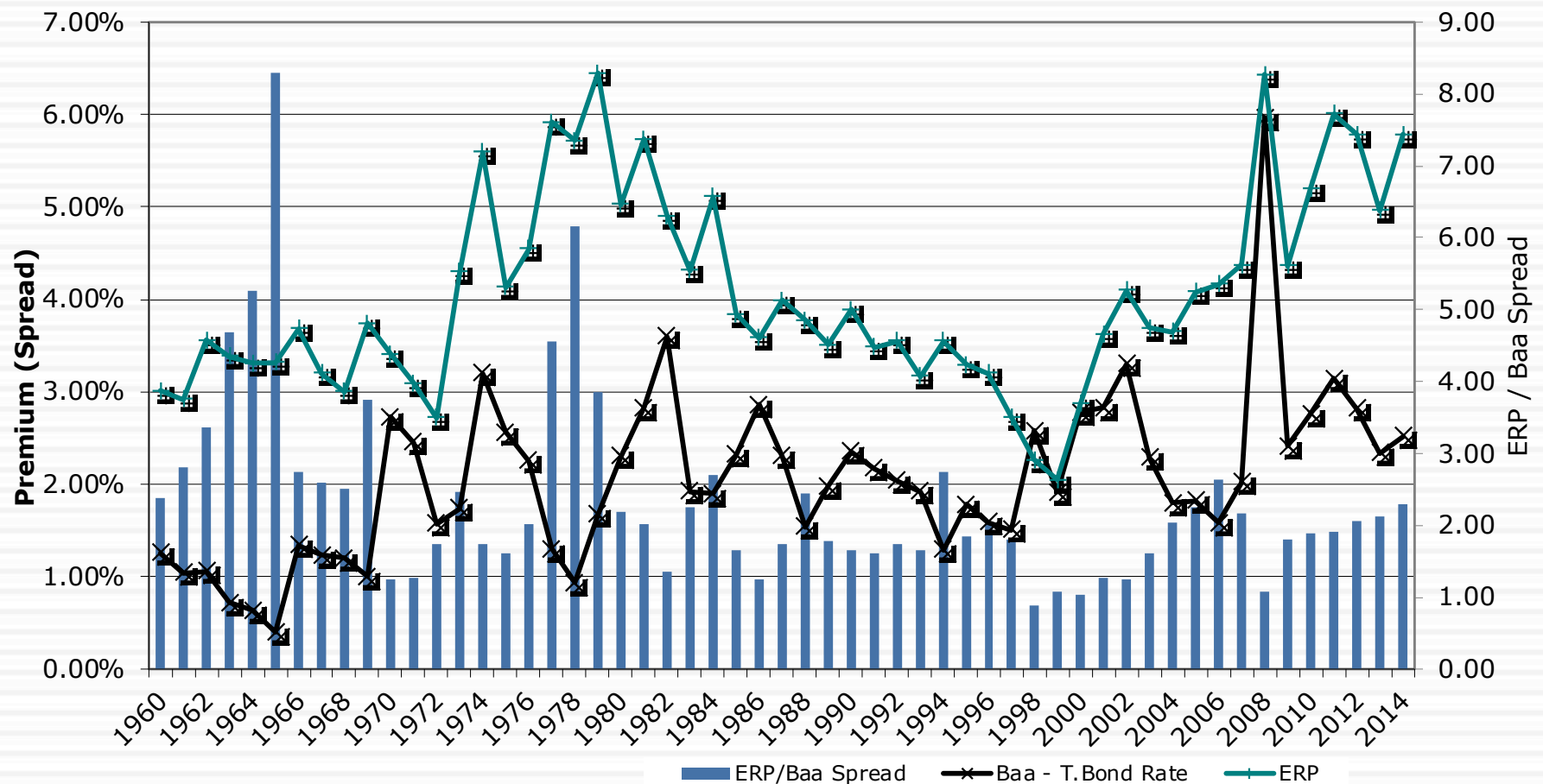
<i>Company</i>	<i>EBITDA</i>	<i>EBIT</i>	<i>Enterprise Value</i>	<i>EBITDA/ EV</i>	<i>EBIT/EV</i>	<i>Optimal Debt</i>	<i>Optimal Debt Ratio</i>
Disney	\$12,517	\$10,032	\$133,908	9.35%	7.49%	\$55,136	40.00%
Vale	\$20,167	\$15,667	\$112,352	17.95%	13.94%	\$35,845	30.00%
Tata Motors	250,116₹	166,605₹	1,427,478₹	17.52%	11.67%	325,986₹	20.00%
Baidu	¥13,073	¥10,887	¥342,269	3.82%	3.18%	¥35,280	10.00%
Bookscape	\$4,150	\$2,536	\$42,636	9.73%	5.95%	\$13,091	30.00%

3. Operating Risk

- Firms that face more risk or uncertainty in their operations (and more variable operating income as a consequence) will have lower optimal debt ratios than firms that have more predictable operations.
- Operating risk enters the cost of capital approach in two places:
 - Unlevered beta: Firms that face more operating risk will tend to have higher unlevered betas. As they borrow, debt will magnify this already large risk and push up costs of equity much more steeply.
 - Bond ratings: For any given level of operating income, firms that face more risk in operations will have lower ratings. The ratings are based upon normalized income.

4. The only macro determinant: Equity vs Debt Risk Premiums

Equity Risk Premiums and Bond Default Spreads



⌚ Application Test: Your firm's optimal financing mix

- Using the optimal capital structure spreadsheet provided:
 - ▣ Estimate the optimal debt ratio for your firm
 - ▣ Estimate the new cost of capital at the optimal
 - ▣ Estimate the effect of the change in the cost of capital on firm value
 - ▣ Estimate the effect on the stock price
- In terms of the mechanics, what would you need to do to get to the optimal immediately?

Bloomberg FA page
Capstru.xls

Another Approach to the Optimal: Relative Analysis

- The “safest” place for any firm to be is close to the industry average
- Subjective adjustments can be made to these averages to arrive at the right debt ratio.
 - ▣ Higher tax rates -> Higher debt ratios (Tax benefits)
 - ▣ Lower insider ownership -> Higher debt ratios (Greater discipline)
 - ▣ More stable income -> Higher debt ratios (Lower bankruptcy costs)
 - ▣ More intangible assets -> Lower debt ratios (More agency problems)

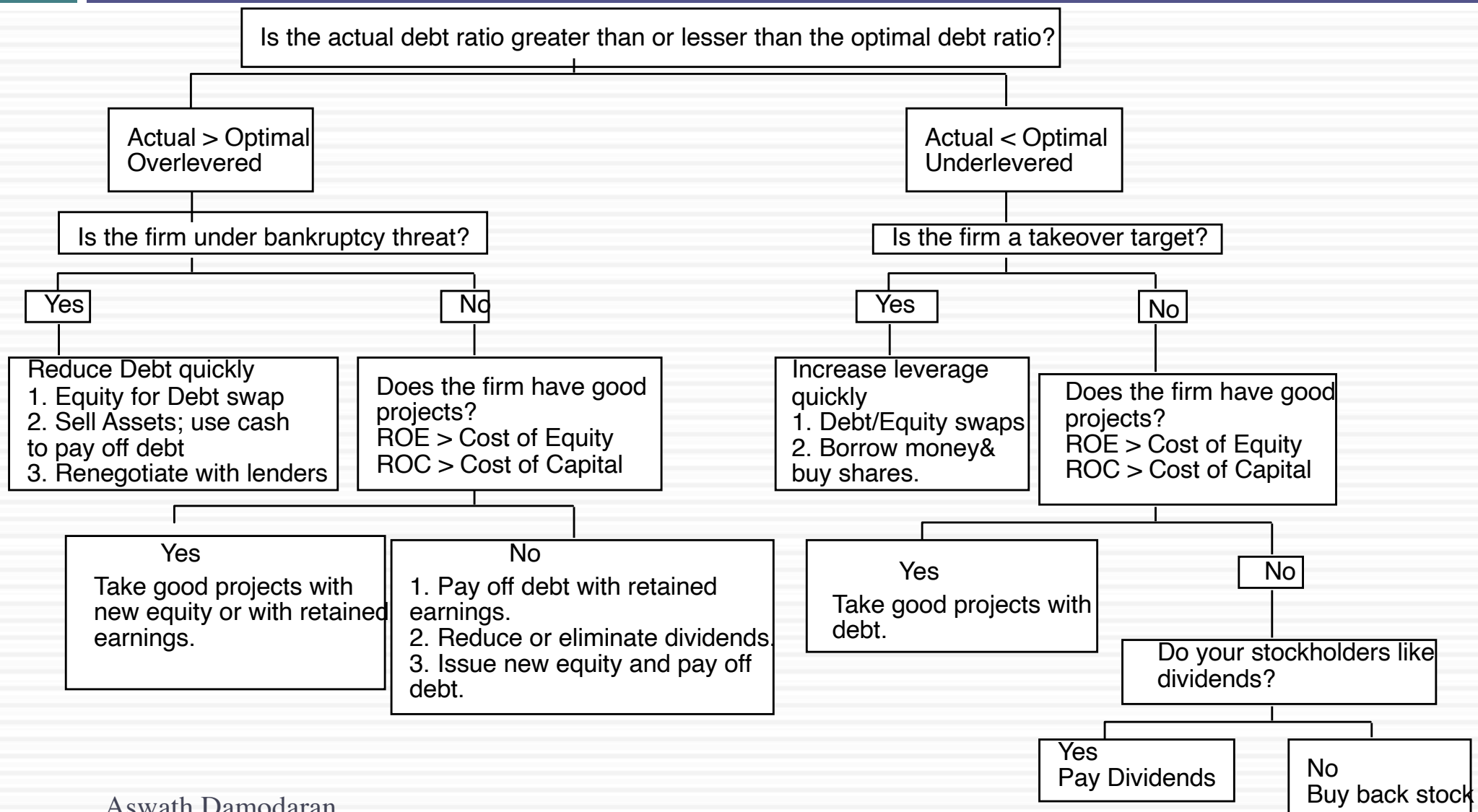
Comparing to industry averages

<i>Company</i>	<i>Debt to Capital Ratio</i>		<i>Net Debt to Capital Ratio</i>		<i>Comparable group</i>	<i>Debt to Capital Ratio</i>		<i>Net Debt to Capital Ratio</i>	
	<i>Book value</i>	<i>Market value</i>	<i>Book value</i>	<i>Market value</i>		<i>Book value</i>	<i>Market value</i>	<i>Book value</i>	<i>Market value</i>
Disney	22.88%	11.58%	17.70%	8.98%	US Entertainment	39.03%	15.44%	24.92%	9.93%
Vale	39.02%	35.48%	34.90%	31.38%	Global Diversified Mining & Iron Ore (Market cap> \$1 b)	34.43%	26.03%	26.01%	17.90%
Tata Motors	58.51%	29.28%	22.44%	19.25%	Global Autos (Market Cap> \$1 b)	35.96%	18.72%	3.53%	0.17%
Baidu	32.93%	5.23%	20.12%	2.32%	Global Online Advertising	6.37%	1.83%	-27.13%	-2.76%

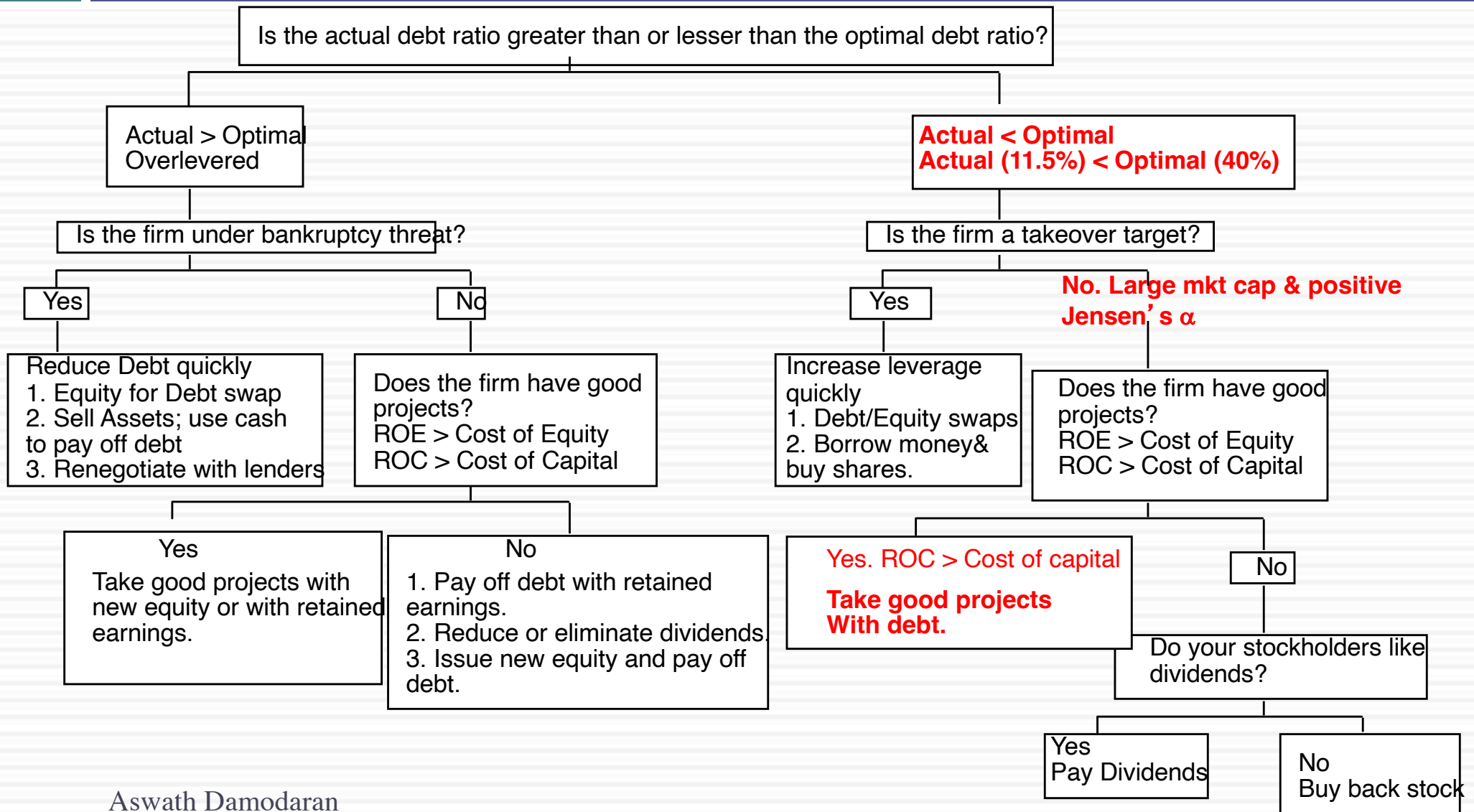
Now that we have an optimal.. And an actual.. What next?

- At the end of the analysis of financing mix (using whatever tool or tools you choose to use), you can come to one of three conclusions:
 - ▣ The firm has the right financing mix
 - ▣ It has too little debt (it is under levered)
 - ▣ It has too much debt (it is over levered)
- The next step in the process is
 - ▣ Deciding how much quickly or gradually the firm should move to its optimal
 - ▣ Assuming that it does, the right kind of financing to use in making this adjustment

A Framework for Getting to the Optimal



Disney: Applying the Framework



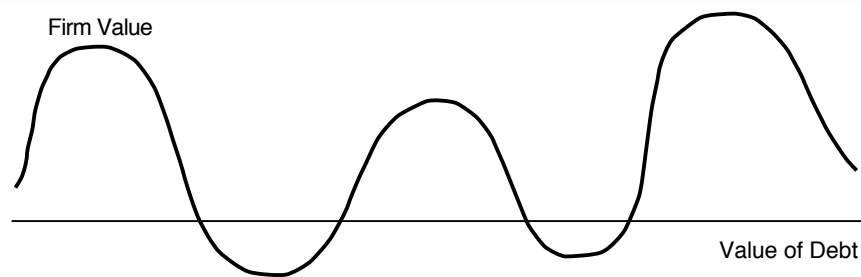
Application Test: Getting to the Optimal

- Based upon your analysis of both the firm's capital structure and investment record, what path would you map out for the firm?
 - a. Immediate change in leverage
 - b. Gradual change in leverage
 - c. No change in leverage
- Would you recommend that the firm change its financing mix by
 - a. Paying off debt/Buying back equity
 - b. Take projects with equity/debt

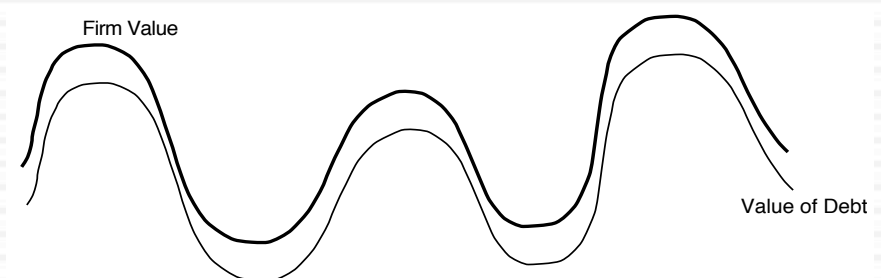
Designing Debt: The Fundamental Principle

- The objective in designing debt is to make the cash flows on debt match up as closely as possible with the cash flows that the firm makes on its assets.
- By doing so, we reduce our risk of default, increase debt capacity and increase firm value.

Unmatched Debt

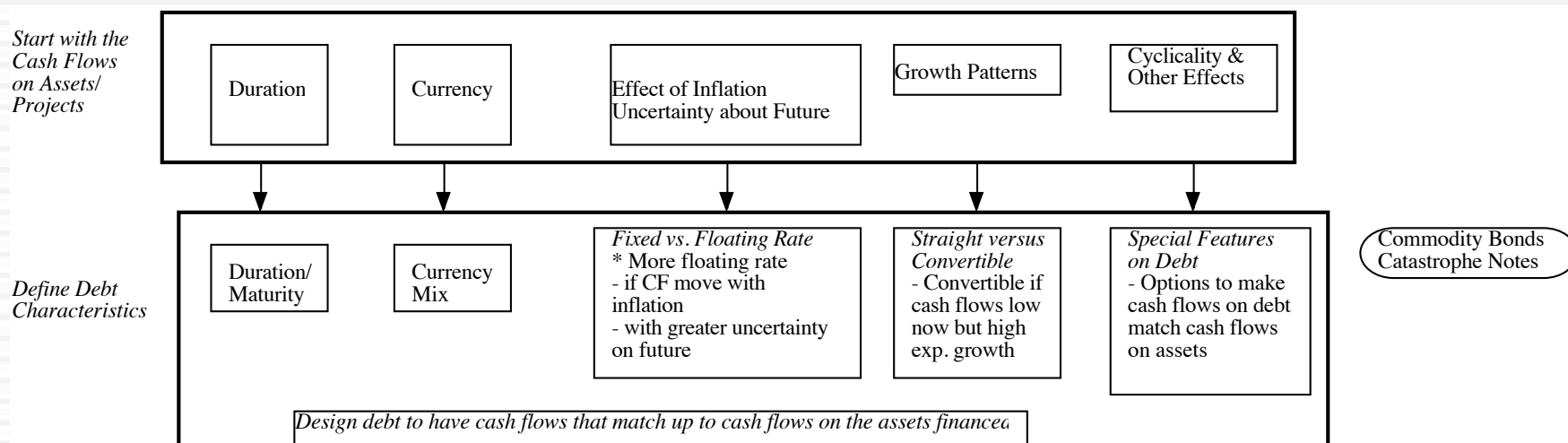


Matched Debt



Design the perfect financing instrument

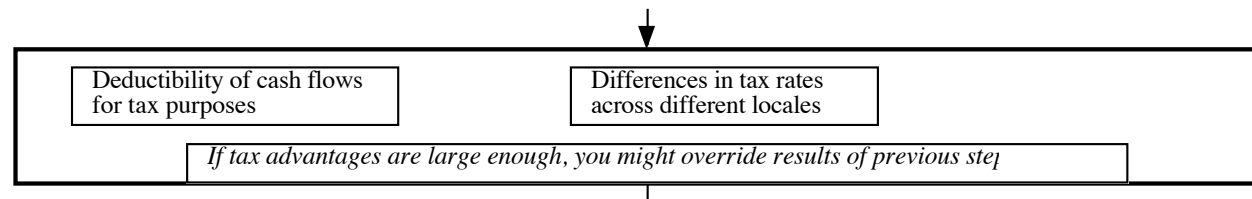
- The perfect financing instrument will
 - ▣ Have all of the tax advantages of debt
 - ▣ While preserving the flexibility offered by equity



Ensuring that you have not crossed the line drawn by the tax code

- All of this design work is lost, however, if the security that you have designed does not deliver the tax benefits.
- In addition, there may be a trade off between mismatching debt and getting greater tax benefits.

Overlay tax preferences



Zero Coupons

While keeping equity research analysts, ratings agencies and regulators applauding

- Ratings agencies want companies to issue equity, since it makes them safer. Equity research analysts want them not to issue equity because it dilutes earnings per share. Regulatory authorities want to ensure that you meet their requirements in terms of capital ratios (usually book value). Financing that leaves all three groups happy is nirvana.

*Consider
ratings agency
& analyst concerns*

Analyst Concerns
- Effect on EPS
- Value relative to comparables

Ratings Agency
- Effect on Ratios
- Ratios relative to comparables

Regulatory Concerns
- Measures used

Operating Leases
MIPs
Surplus Notes

Can securities be designed that can make these different entities happy?

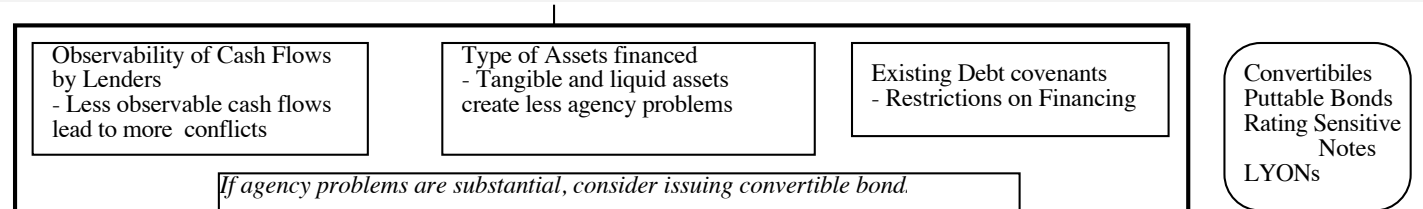
Debt or Equity: The Strange Case of Trust Preferred

- Trust preferred stock has
 - ▣ A fixed dividend payment, specified at the time of the issue
 - ▣ That is tax deductible
 - ▣ And failing to make the payment can cause ? (Can it cause default?)
- When trust preferred was first created, ratings agencies treated it as equity. As they have become more savvy, ratings agencies have started giving firms only partial equity credit for trust preferred.
- Assuming that trust preferred stock gets treated as equity by ratings agencies, which of the following firms is the most appropriate firm to be issuing it?
 - a. A firm that is under levered, but has a rating constraint that would be violated if it moved to its optimal
 - b. A firm that is over levered that is unable to issue debt because of the rating agency concerns.

Soothe bondholder fears

- There are some firms that face skepticism from bondholders when they go out to raise debt, because
 - ▣ Of their past history of defaults or other actions
 - ▣ They are small firms without any borrowing history
- Bondholders tend to demand much higher interest rates from these firms to reflect these concerns.

Factor in agency conflicts between stock and bond holders



And do not lock in market mistakes that work against you

- Ratings agencies can sometimes under rate a firm, and markets can underprice a firm's stock or bonds. If this occurs, firms should not lock in these mistakes by issuing securities for the long term. In particular,
 - ▣ Issuing equity or equity based products (including convertibles), when equity is under priced transfers wealth from existing stockholders to the new stockholders
 - ▣ Issuing long term debt when a firm is under rated locks in rates at levels that are far too high, given the firm's default risk.
- What is the solution
 - ▣ if you need to use equity?
 - ▣ if you need to use debt?

Designing Disney's Debt

<i>Business</i>	<i>Project Cash Flow Characteristics</i>	<i>Type of Financing</i>
Studio entertainment	<p>Movie projects are likely to</p> <ul style="list-style-type: none"> • Be short-term • Have cash outflows primarily in dollars (because Disney makes most of its movies in the U.S.), but cash inflows could have a substantial foreign currency component (because of overseas revenues) • Have net cash flows that are heavily driven by whether the movie is a hit, which is often difficult to predict 	<p>Debt should be</p> <ol style="list-style-type: none"> 1. Short-term 2. Primarily dollar debt. Mixed currency debt, reflecting audience make-up. 3. If possible, tied to the success of movies.
Media networks	<p>Projects are likely to be</p> <ol style="list-style-type: none"> 1. Short-term 2. Primarily in dollars, though foreign component is growing, especially for ESPN. 3. Driven by advertising revenues and show success (Nielsen ratings) 	<p>Debt should be</p> <ol style="list-style-type: none"> 1. Short-term 2. Primarily dollar debt 3. If possible, linked to network ratings
Park resorts	<p>Projects are likely to be</p> <ol style="list-style-type: none"> 1. Very long-term 2. Currency will be a function of the region (rather than country) where park is located. 3. Affected by success of studio entertainment and media networks divisions 	<p>Debt should be</p> <ol style="list-style-type: none"> 1. Long-term 2. Mix of currencies, based on tourist makeup at the park.
Consumer products	<p>Projects are likely to be short- to medium-term and linked to the success of the movie division; most of Disney's product offerings and licensing revenues are derived from their movie productions</p>	<p>Debt should be</p> <ol style="list-style-type: none"> 1. Medium-term 2. Dollar debt
Interactive	<p>Projects are likely to be short-term, with high growth potential and significant risk. While cash flows will initially be primarily in US dollars, the mix of currencies will shift as the business ages.</p>	<p>Debt should be short-term, convertible US dollar debt.</p>

Recommendations for Disney

- The debt issued should be long term and should have duration of about 4.3 years.
- A significant portion of the debt should be floating rate debt, reflecting Disney's capacity to pass inflation through to its customers and the fact that operating income tends to increase as interest rates go up.
- Given Disney's sensitivity to a stronger dollar, a portion of the debt should be in foreign currencies. The specific currency used and the magnitude of the foreign currency debt should reflect where Disney makes its revenues. Based upon 2013 numbers at least, this would indicate that about 18% of its debt should be foreign currency debt. As its broadcasting businesses expand into Latin America, it may want to consider using either Mexican Peso or Brazilian Real debt as well.

Analyzing Disney's Current Debt

- Disney has \$14.3 billion in interest-bearing debt with a face-value weighted average maturity of 7.92 years. Allowing for the fact that the maturity of debt is higher than the duration, this would indicate that Disney's debt may be a little longer than would be optimal, but not by much.
- Of the debt, about 5.49% of the debt is in non-US dollar currencies (Indian rupees and Hong Kong dollars), but the rest is in US dollars and the company has no Euro debt. Based on our analysis, we would suggest that Disney increase its proportion of Euro debt to about 12% and tie the choice of currency on future debt issues to its expansion plans.
- Disney has no convertible debt and about 5.67% of its debt is floating rate debt, which looks low, given the company's pricing power. While the mix of debt in 2013 may be reflective of a desire to lock in low long-term interest rates on debt, as rates rise, the company should consider expanding its use of foreign currency debt.

Adjusting Debt at Disney

- It can swap some of its existing fixed rate, dollar debt for floating rate, foreign currency debt. Given Disney's standing in financial markets and its large market capitalization, this should not be difficult to do.
- If Disney is planning new debt issues, either to get to a higher debt ratio or to fund new investments, it can use primarily floating rate, foreign currency debt to fund these new investments. Although it may be mismatching the funding on these investments, its debt matching will become better at the company level.

Application Test: Choosing your Financing Type

- Based upon the business that your firm is in, and the typical investments that it makes, what kind of financing would you expect your firm to use in terms of
 - a. Duration (long term or short term)
 - b. Currency
 - c. Fixed or Floating rate
 - d. Straight or Convertible