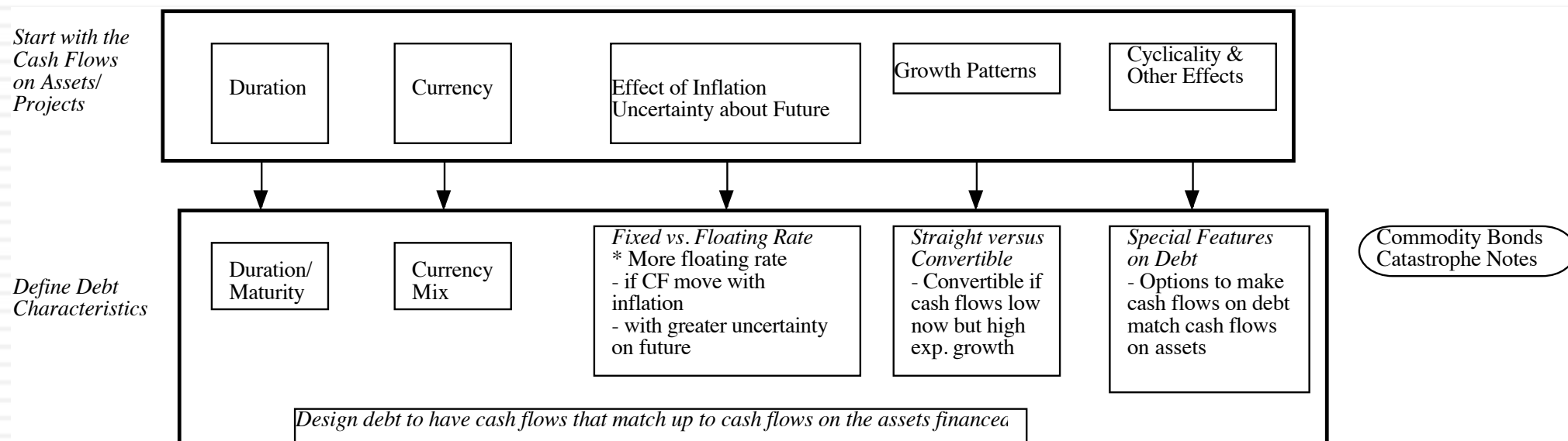


Design the perfect financing instrument

112

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

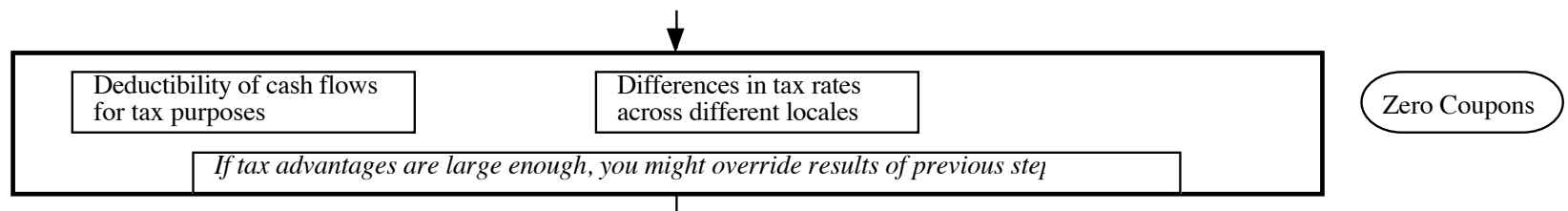


Ensuring that you have not crossed the line drawn by the tax code

113

- 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

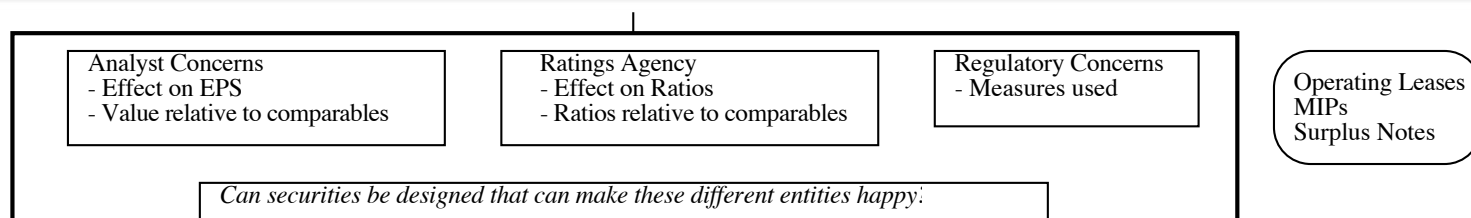


While keeping equity research analysts, ratings agencies and regulators applauding

114

- 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*



Debt or Equity: The Strange Case of Trust Preferred

115

- 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 give these shareholders voting rights
- 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.

Debt, Equity and Quasi Equity

116

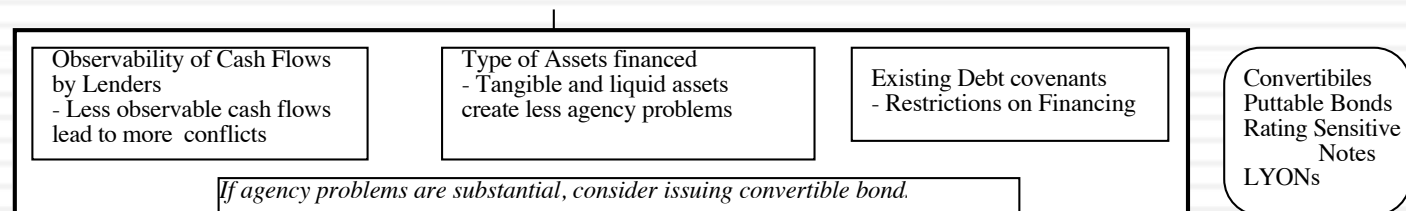
- Assuming that trust preferred stock gets treated as equity by ratings agencies, which of the following firms is the most appropriate firm to be issuing it?
 - a. A firm that is under levered, but has a rating constraint that would be violated if it moved to its optimal
 - b. A firm that is over levered that is unable to issue debt because of the rating agency concerns.

Soothe bondholder fears

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- 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

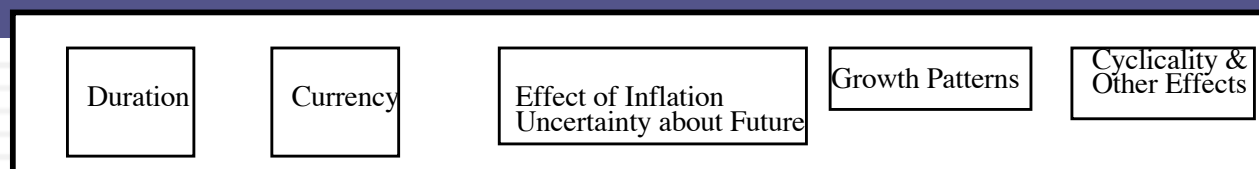
118

- Ratings agencies can sometimes under rate a firm, and markets can under price 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?

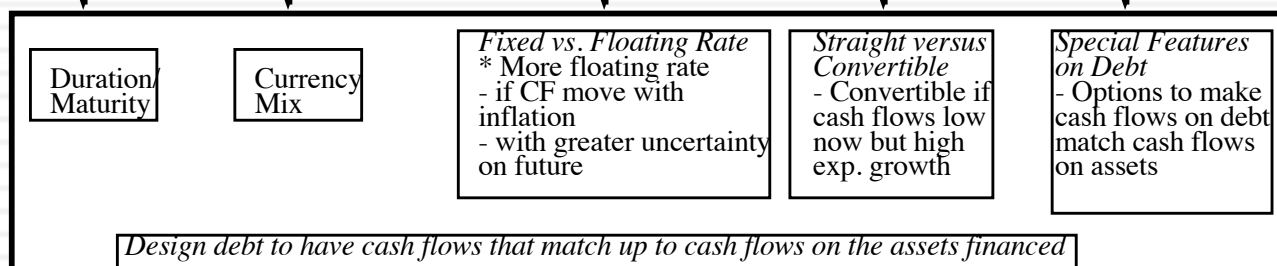
Designing Debt: Bringing it all together

119

Start with the Cash Flows on Assets/ Projects

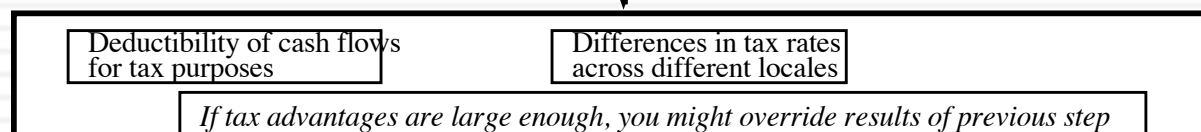


Define Debt Characteristics



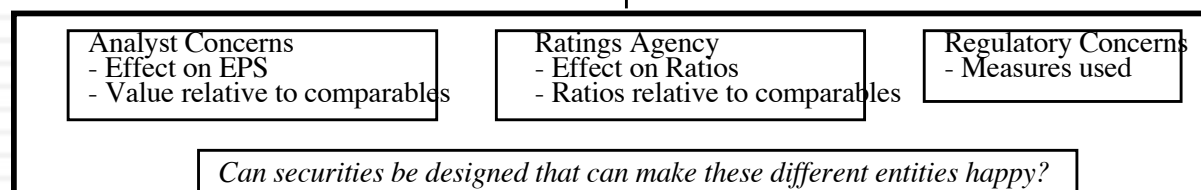
Commodity Bonds
Catastrophe Notes

Overlay tax preferences



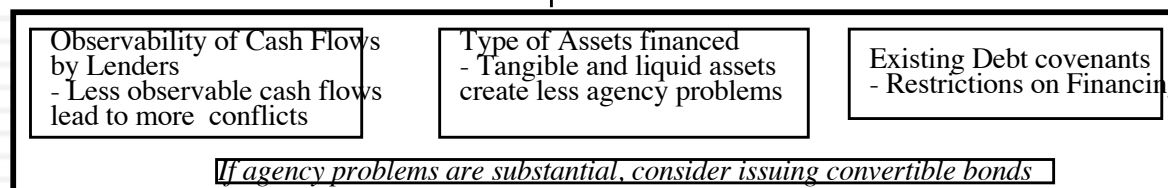
Zero Coupons

Consider ratings agency & analyst concerns



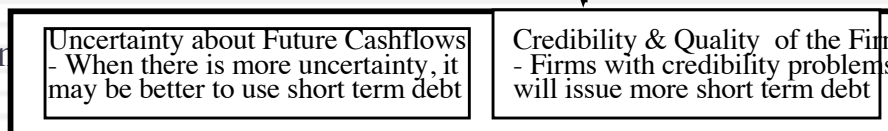
Operating Leases
MIPs
Surplus Notes

Factor in agency conflicts between stock and bond holders



Convertibles
Puttable Bonds
Rating Sensitive Notes
LYONs

Consider Information Asymmetries



Approaches for evaluating Asset Cash Flows

120

I. Intuitive Approach

- ▣ Are the projects typically long term or short term? What is the cash flow pattern on projects?
- ▣ How much growth potential does the firm have relative to current projects?
- ▣ How cyclical are the cash flows? What specific factors determine the cash flows on projects?

II. Project Cash Flow Approach

- ▣ Estimate expected cash flows on a typical project for the firm
- ▣ Do scenario analyses on these cash flows, based upon different macro economic scenarios

III. Historical Data

- ▣ Operating Cash Flows
- ▣ Firm Value

I. Intuitive Approach - Disney

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<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. 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>

Application Test: Choosing your Financing Type

122

- 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

II. Project Specific Financing

123

- With project specific financing, you match the financing choices to the project being funded. The benefit is that the debt is truly customized to the project.
- Project specific financing makes the most sense when you have a few large, independent projects to be financed. It becomes both impractical and costly when firms have portfolios of projects with interdependent cashflows.

Duration of Disney Theme Park

124

Year	Annual Cashflow	Terminal Value	Present Value @8.46%	Present value *t
0	-\$2,000		-\$2,000	\$0
1	-\$1,000		-\$922	-\$922
2	-\$859		-\$730	-\$1,460
3	-\$267		-\$210	-\$629
4	\$340		\$246	\$983
5	\$466		\$311	\$1,553
6	\$516		\$317	\$1,903
7	\$555		\$314	\$2,200
8	\$615		\$321	\$2,568
9	\$681		\$328	\$2,952
10	\$715	\$11,275	\$5,321	\$53,206
			\$3,296	\$62,355
				18.91893724

Duration of the Project = $62,355/3296 = 18.92$ years

The perfect theme park debt...

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- The perfect debt for this theme park would have a duration of roughly 19 years and be in a mix of Latin American currencies (since it is located in Brazil), reflecting where the visitors to the park are coming from.
- If possible, you would tie the interest payments on the debt to the number of visitors at the park.

III. Firm-wide financing

126

- Rather than look at individual projects, you could consider the firm to be a portfolio of projects. The firm's past history should then provide clues as to what type of debt makes the most sense.
- Operating Cash Flows
 - The question of how sensitive a firm's asset cash flows are to a variety of factors, such as interest rates, inflation, currency rates and the economy, can be directly tested by regressing changes in the operating income against changes in these variables.
 - This analysis is useful in determining the coupon/interest payment structure of the debt.
- Firm Value
 - The firm value is clearly a function of the level of operating income, but it also incorporates other factors such as expected growth & cost of capital.
 - The firm value analysis is useful in determining the overall structure of the debt, particularly maturity.

Disney: Historical Data

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Date	Operating Income	Enterprise Value (V)	% Chg in OI	% Chg in V
2013	9450	\$126,815	6.62%	21.09%
2012	8863	\$104,729	13.91%	56.85%
2011	7781	\$66,769	15.69%	-9.19%
2010	6726	\$73,524	18.06%	22.84%
2009	5697	\$59,855	-23.06%	-18.11%
2008	\$7,404	\$73,091	8.42%	-6.27%
2007	\$6,829	\$77,980	27.53%	2.98%
2006	\$5,355	\$75,720	30.39%	27.80%
2005	\$4,107	\$59,248	1.46%	2.55%
2004	\$4,048	\$57,776	49.21%	9.53%
2003	\$2,713	\$52,747	13.80%	20.45%
2002	\$2,384	\$43,791	-15.82%	-9.01%
2001	\$2,832	\$48,128	12.16%	-45.53%
2000	\$2,525	\$88,355	-22.64%	35.67%
1999	\$3,264	\$65,125	-15.07%	-5.91%
1998	\$3,843	\$69,213	-2.59%	6.20%
1997	\$3,945	\$65,173	30.46%	18.25%
1996	\$3,024	\$55,116	33.69%	77.65%
1995	\$2,262	\$31,025	25.39%	39.75%
1994	\$1,804	\$22,200	15.64%	9.04%
1993	\$1,560	\$20,360	21.21%	6.88%
1992	\$1,287	\$19,049	28.19%	23.89%
1991	\$1,004	\$15,376	-21.99%	26.50%
1990	\$1,287	\$12,155	16.05%	-23.64%
1989	\$1,109	\$15,918	40.56%	101.93%
1988	\$789	\$7,883	11.60%	-23.91%
1987	\$707	\$10,360	53.03%	83.69%
1986	\$462	\$5,640	25.20%	61.23%
1985	\$369	\$3,498	157.99%	24.37%

The Macroeconomic Data

128

Date	Change in T.Bond rate	% Chg in GDP	% Change in CPI	% Change in US \$
2013	1.07%	1.83%	1.18%	4.89%
2012	-0.11%	2.20%	-1.03%	2.75%
2011	-1.37%	1.81%	1.48%	-4.59%
2010	-0.53%	2.39%	1.97%	-3.64%
2009	1.29%	-3.07%	-3.98%	5.79%
2008	-1.44%	-1.18%	-4.26%	10.88%
2007	-0.65%	2.93%	2.19%	-11.30%
2006	0.30%	3.40%	-1.84%	-2.28%
2005	0.16%	3.68%	0.66%	3.98%
2004	0.13%	3.72%	1.34%	-3.92%
2003	0.05%	4.32%	-0.65%	-14.59%
2002	-0.97%	2.80%	1.44%	-11.17%
2001	-0.18%	-0.04%	-2.50%	7.45%
2000	-0.98%	2.24%	0.96%	7.73%
1999	1.56%	4.70%	1.04%	1.68%
1998	-1.03%	4.51%	0.11%	-4.08%
1997	-0.63%	4.33%	-1.43%	9.40%
1996	0.80%	4.43%	0.31%	4.14%
1995	-2.09%	2.01%	-0.08%	-0.71%
1994	1.92%	4.12%	0.27%	-5.37%
1993	-0.83%	2.50%	-0.72%	0.56%
1992	-0.02%	4.15%	0.64%	6.89%
1991	-1.26%	1.09%	-2.89%	0.69%
1990	0.12%	0.65%	0.43%	-8.00%
1989	-1.11%	2.66%	0.51%	2.04%
1988	0.26%	3.66%	0.60%	1.05%
1987	1.53%	4.49%	2.54%	-12.01%
1986	-1.61%	2.83%	-2.33%	-15.26%
1985	-2.27%	4.19%	3.89%	-13.51%

I. Sensitivity to Interest Rate Changes

129

- How sensitive is the firm's value and operating income to changes in the level of interest rates?
- The answer to this question is important because it
 - ▣ it provides a measure of the duration of the firm's projects
 - ▣ it provides insight into whether the firm should be using fixed or floating rate debt.

Firm Value versus Interest Rate Changes

130

- Regressing changes in firm value against changes in interest rates over this period yields the following regression –

$$\text{Change in Firm Value} = 0.1790 - 2.3251 (\text{Change in Interest Rates})$$

(2.74) (0.39)

- T statistics are in brackets.

- The coefficient on the regression (-2.33) measures how much the value of Disney as a firm changes for a unit change in interest rates.

Why the coefficient on the regression is duration..

131

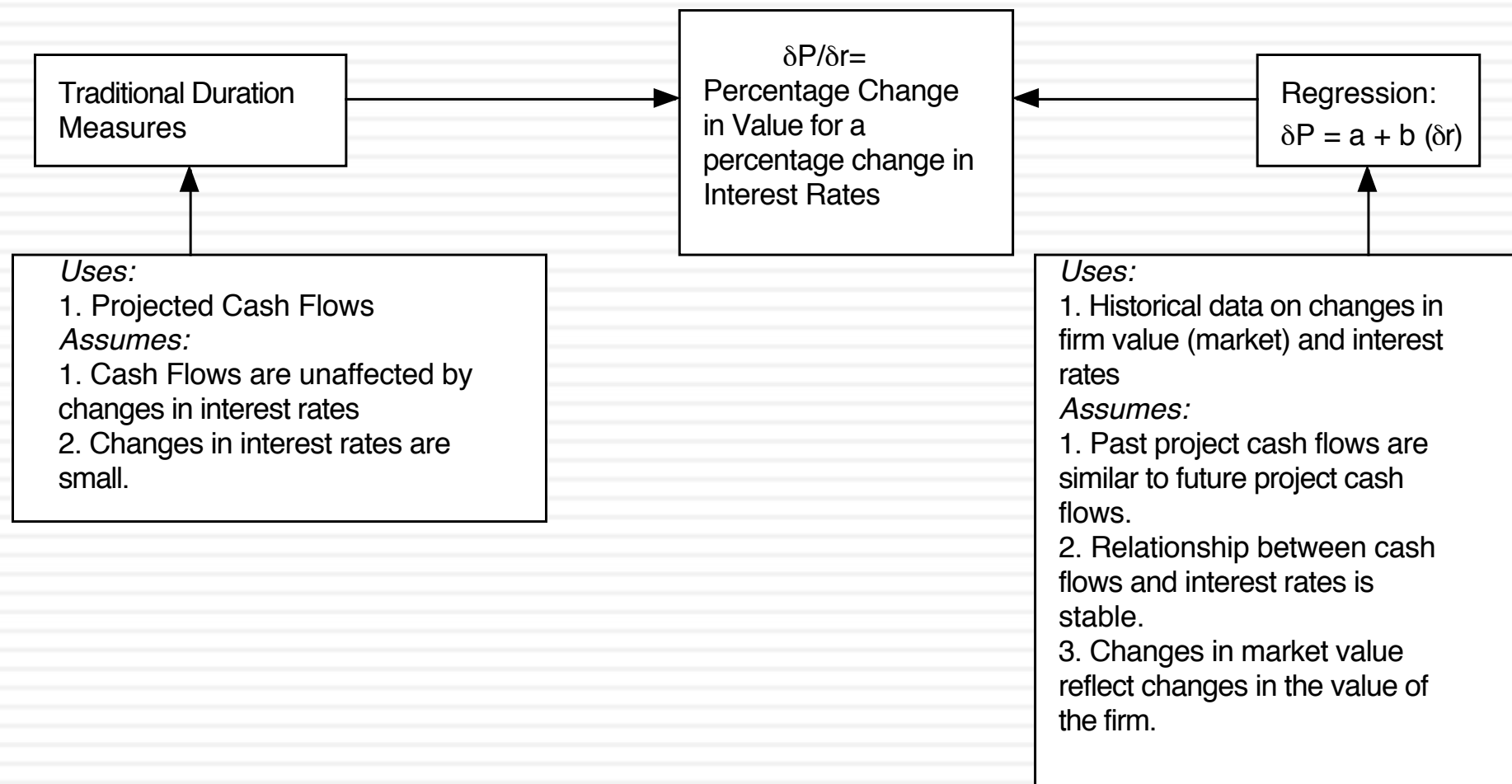
- The duration of a straight bond or loan issued by a company can be written in terms of the coupons (interest payments) on the bond (loan) and the face value of the bond to be –

$$\text{Duration of Bond} = \frac{dP/P}{dr/r} = \frac{\left[\sum_{t=1}^{t=N} \frac{t * \text{Coupon}_t}{(1+r)^t} + \frac{N * \text{Face Value}}{(1+r)^N} \right]}{\left[\sum_{t=1}^{t=N} \frac{\text{Coupon}_t}{(1+r)^t} + \frac{\text{Face Value}}{(1+r)^N} \right]}$$

- The duration of a bond measures how much the price of the bond changes for a unit change in interest rates.
- Holding other factors constant, the duration of a bond will increase with the maturity of the bond, and decrease with the coupon rate on the bond.

Duration: Comparing Approaches

132



Operating Income versus Interest Rates

133

- Regressing changes in operating cash flow against changes in interest rates over this period yields the following regression –

$$\text{Change in Operating Income} = 0.1698 - 7.9339 (\text{Change in Interest Rates})$$

(2.69^a) (1.40)

Conclusion: Disney's operating income has been affected a lot more than its firm value has by changes in interest rates.

II. Sensitivity to Changes in GDP/ GNP

134

- How sensitive is the firm's value and operating income to changes in the GNP/GDP?
- The answer to this question is important because
 - ▣ it provides insight into whether the firm's cash flows are cyclical and
 - ▣ whether the cash flows on the firm's debt should be designed to protect against cyclical factors.
- If the cash flows and firm value are sensitive to movements in the economy, the firm will either have to issue less debt overall, or add special features to the debt to tie cash flows on the debt to the firm's cash flows.

Regression Results

135

- Regressing changes in firm value against changes in the GDP over this period yields the following regression –

$$\begin{array}{lcl} \text{Change in Firm Value} = & 0.0067 + 6.7000 (\text{GDP Growth}) & \\ & (0.06) \quad (2.03^a) & \end{array}$$

Conclusion: Disney is sensitive to economic growth

- Regressing changes in operating cash flow against changes in GDP over this period yields the following regression –

$$\begin{array}{lcl} \text{Change in Operating Income} = & 0.0142 + 6.6443 (\text{GDP Growth}) & \\ & (0.13) \quad (2.05^a) & \end{array}$$

Conclusion: Disney's operating income is sensitive to economic growth as well.

III. Sensitivity to Currency Changes

136

- How sensitive is the firm's value and operating income to changes in exchange rates?
- The answer to this question is important, because
 - ▣ it provides a measure of how sensitive cash flows and firm value are to changes in the currency
 - ▣ it provides guidance on whether the firm should issue debt in another currency that it may be exposed to.
- If cash flows and firm value are sensitive to changes in the dollar, the firm should
 - ▣ figure out which currency its cash flows are in;
 - ▣ and issued some debt in that currency

Regression Results

137

- Regressing changes in firm value against changes in the dollar over this period yields the following regression –

$$\text{Change in Firm Value} = 0.1774 - 0.5705 (\text{Change in Dollar})$$

(2.76) (0.67)

Conclusion: Disney's value is sensitive to exchange rate changes, decreasing as the dollar strengthens. However, the effect is statistically insignificant.

- Regressing changes in operating cash flow against changes in the dollar over this period yields the following regression –

$$\text{Change in Operating Income} = 0.1680 - 1.6773 (\text{Change in Dollar})$$

(2.82^a) (2.13^a)

Conclusion: Disney's operating income is more strongly impacted by the dollar than its value is. A stronger dollar seems to hurt operating income.

IV. Sensitivity to Inflation

138

- How sensitive is the firm's value and operating income to changes in the inflation rate?
- The answer to this question is important, because
 - ▣ it provides a measure of whether cash flows are positively or negatively impacted by inflation.
 - ▣ it then helps in the design of debt; whether the debt should be fixed or floating rate debt.
- If cash flows move with inflation, increasing (decreasing) as inflation increases (decreases), the debt should have a larger floating rate component.

Regression Results

139

- Regressing changes in firm value against changes in inflation over this period yields the following regression –

$$\text{Change in Firm Value} = \begin{matrix} 0.1855 \\ (2.96) \end{matrix} + \begin{matrix} 2.9966 \\ (0.90) \end{matrix} (\text{Change in Inflation Rate})$$

Conclusion: Disney's firm value does seem to increase with inflation, but not by much (statistical significance is low)

- Regressing changes in operating cash flow against changes in inflation over this period yields the following regression –

$$\text{Change in Operating Income} = \begin{matrix} 0.1919 \\ (3.43^a) \end{matrix} + \begin{matrix} 8.1867 \\ (2.76^a) \end{matrix} (\text{Change in Inflation Rate})$$

Conclusion: Disney's operating income increases in periods when inflation increases, suggesting that Disney does have pricing power.

Summarizing...

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- Looking at the four macroeconomic regressions, we would conclude that
 - ▣ Disney's assets collectively have a duration of about 2.33 years
 - ▣ Disney is increasingly affected by economic cycles
 - ▣ Disney is hurt by a stronger dollar
 - ▣ Disney's operating income tends to move with inflation
- All of the regression coefficients have substantial standard errors associated with them. One way to reduce the error (a la bottom up betas) is to use sector-wide averages for each of the coefficients.

Bottom-up Estimates

141

These weights
reflect the
estimated values
of the businesses

<i>Business</i>	<i>Interest rates</i>	<i>GDP Growth</i>	<i>Inflation</i>	<i>Currency</i>	<i>Weights</i>
Media Networks	-3.70	0.56	1.41	-1.23	49.27%
Parks & Resorts	-4.50	0.70	-3.05	-1.58	33.81%
Studio Entertainment	-6.47	0.22	-1.45	-3.21	13.49%
Consumer Products	-4.88	0.13	-5.51	-3.01	2.18%
Interactive	-1.01	0.25	-3.55	-2.86	1.25%
Disney Operations	-4.34	0.55	-0.70	-1.67	100.00%

Recommendations for Disney

142

- 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 in foreign currencies (and perhaps more, since even their US dollar income can be affected by currency movements).

Analyzing Disney's Current Debt

143

- 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

144

- 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.

Debt Design for Bookscape & Vale

145

- *Bookscape*: Given Bookscape's dependence on revenues at its New York bookstore, we would design the debt to be
Recommendation: Long-term, dollar denominated, fixed rate debt
Actual: Long term operating lease on the store
- *Vale*: Vale's mines are spread around the world, and it generates a large portion of its revenues in China (37%). Its mines typically have very long lives and require large up-front investments, and the costs are usually in the local currencies but its revenues are in US dollars.
 - Recommendation: Long term, dollar-denominated debt (with hedging of local currency risk exposure) and if possible, tied to commodity prices.
 - Actual: The existing debt at Vale is primarily US dollar debt (65.48%), with an average maturity of 14.70 years. All of the debt, as far as we can assess, is fixed rate and there is no commodity-linked debt.

And for Tata Motors and Baidu

146

- *Tata Motors*: As an manufacturing firm, with big chunks of its of its revenues coming from India and China (about 24% apiece) and the rest spread across developed markets.
 - Recommendation: Medium to long term, fixed rate debt in a mix of currencies reflecting operations.
 - Actual: The existing debt at Tata Motors is a mix of Indian rupee debt (about 71%) and Euro debt (about 29%), with an average maturity of 5.33 years and it is almost entirely fixed rate debt.
- *Baidu*: Baidu has relatively little debt at the moment, reflecting its status as a young, technology company.
 - Recommendation: Convertible, Chinese Yuan debt.
 - Actual: About 82% of Baidu's debt is in US dollars and Euros currently, with an average maturity of 5.80 years. A small portion is floating rate debt, but very little of the debt is convertible.