

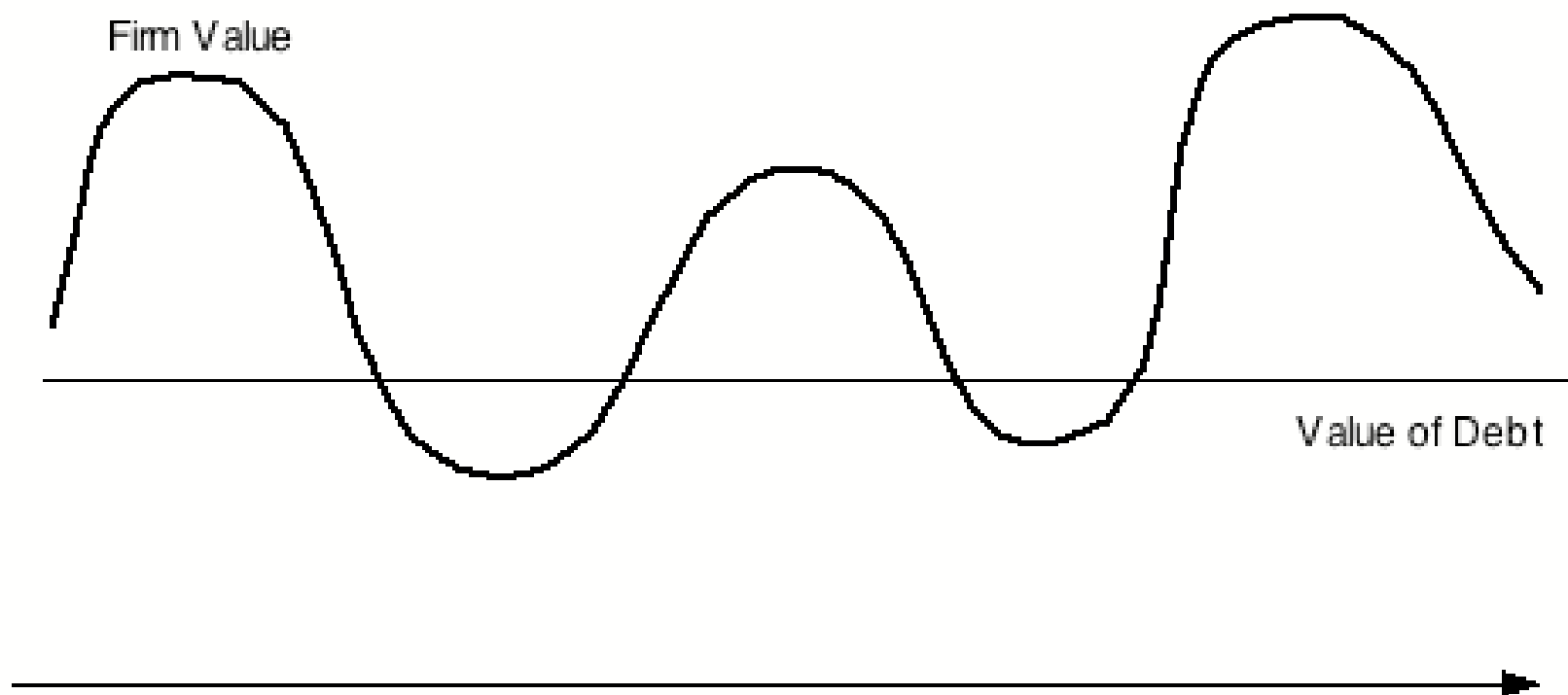


Designing the Perfect Debt

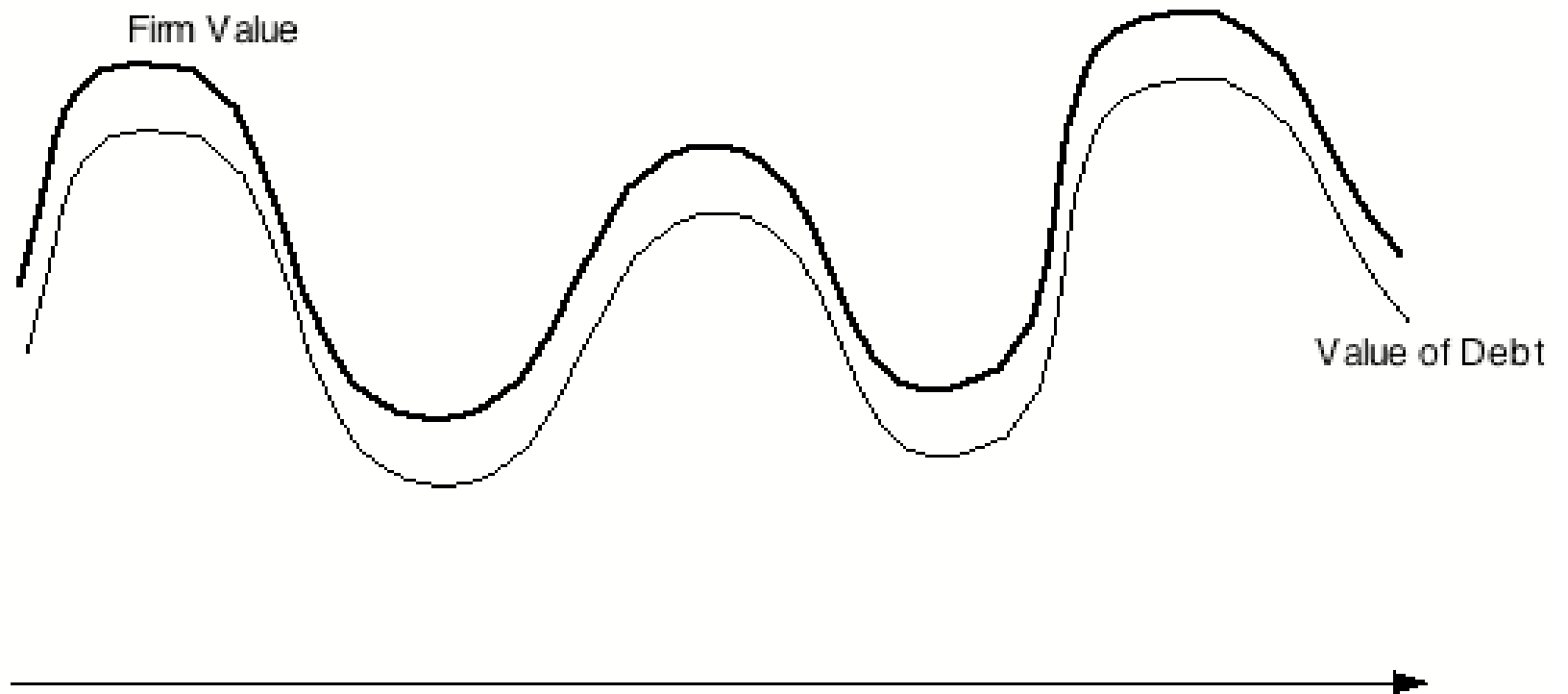
Designing Debt: The Fundamental Principle

- 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.

Firm with mismatched debt

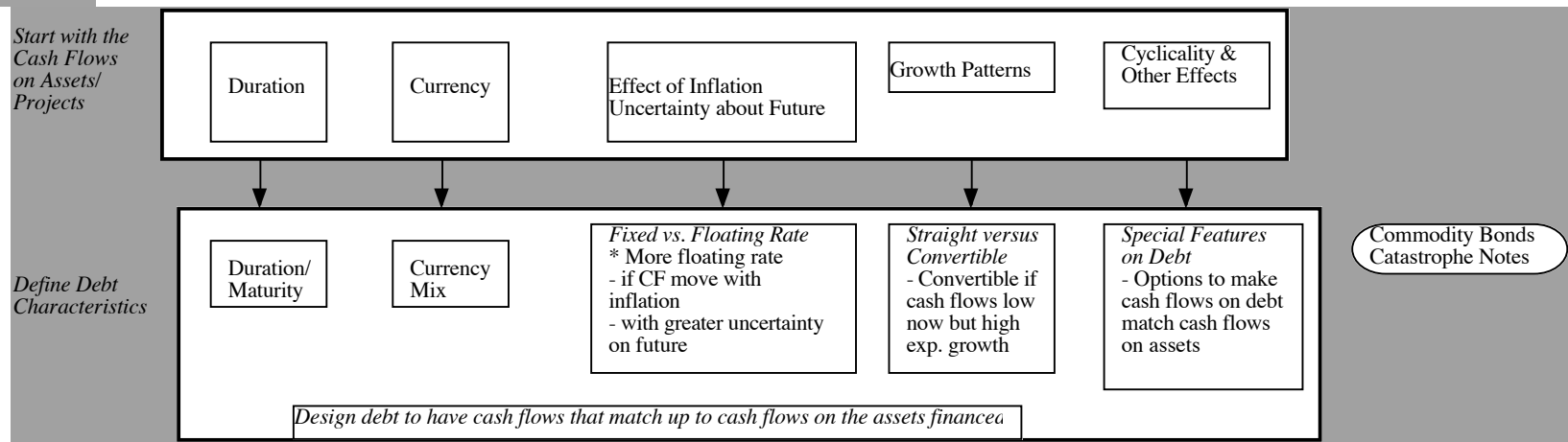


Firm with matched Debt



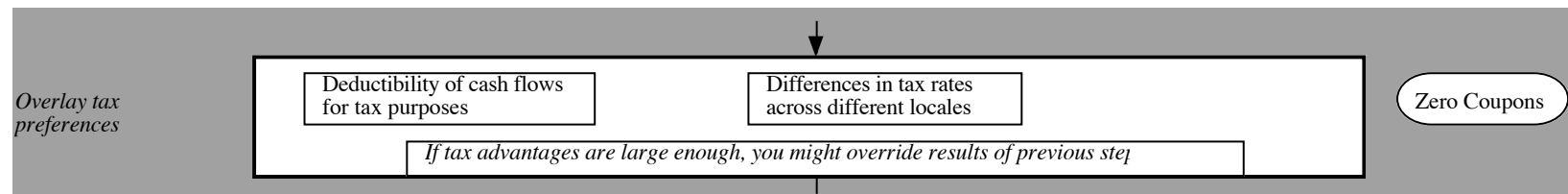
Design the perfect financing instrument

- 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.



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.

Debt, Equity and Quasi Equity

- 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 firm that is under levered, but has a rating constraint that would be violated if it moved to its optimal
 - 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

Observability of Cash Flows by Lenders
- Less observable cash flows lead to more conflicts

Type of Assets financed
- Tangible and liquid assets create less agency problems

Existing Debt covenants
- Restrictions on Financing

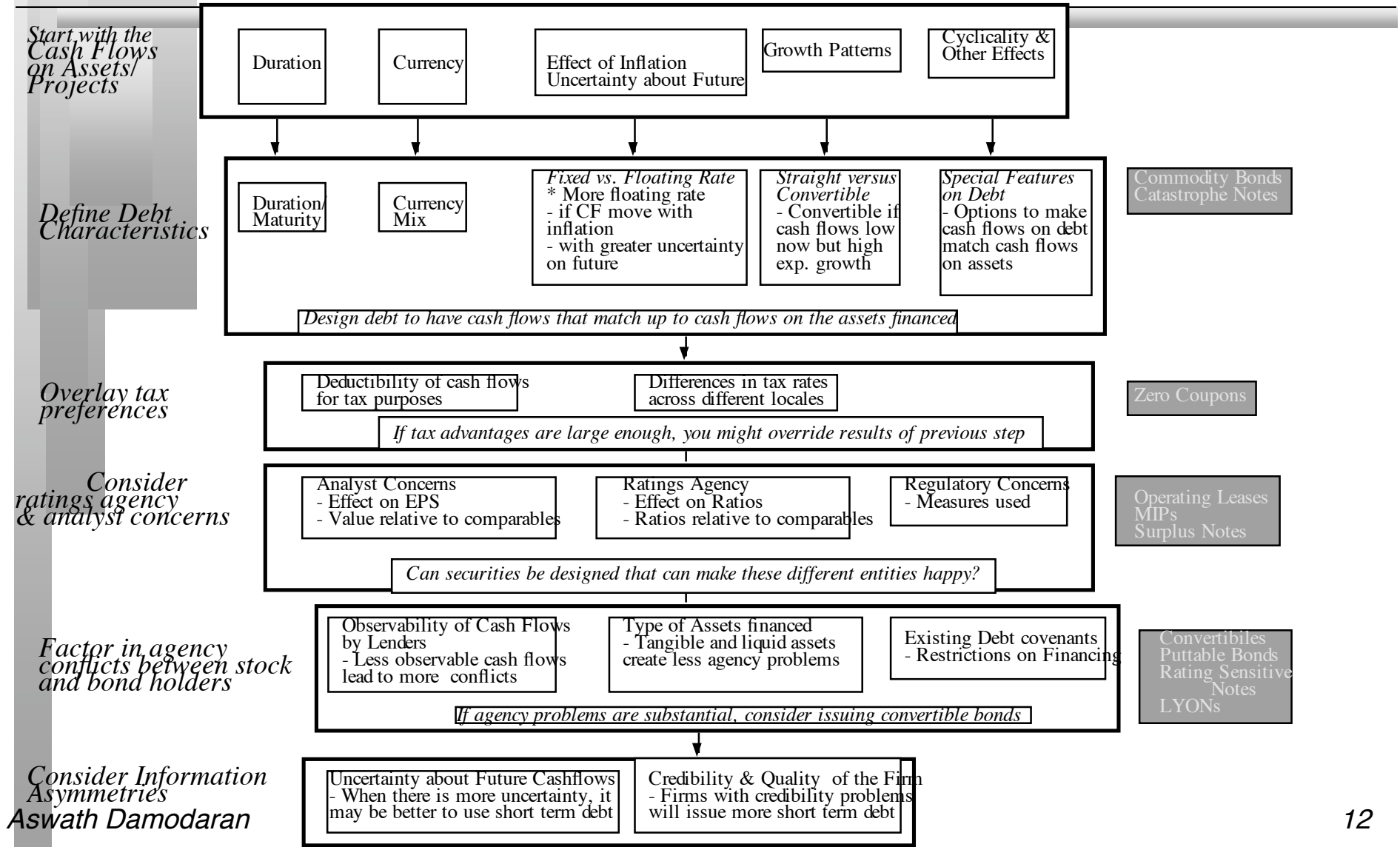
Convertibles
Puttable Bonds
Rating Sensitive
Notes
LYONs

If agency problems are substantial, consider issuing convertible bond.

And do not lock in market mistakes that work against you

- 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



Aswath Damodaran

Approaches for evaluating Asset Cash Flows

- 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
 - Project 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

<i>Business</i>	<i>Project Cash Flow Characteristics</i>	<i>Type of Financing</i>
Movies	Projects are likely to <ol style="list-style-type: none"> 1. Be short term 2. Have cash outflows primarily in dollars (since Disney makes most of its movies in the U.S.) but cash inflows could have a substantial foreign currency component (because of overseas sales) 3. Have net cash flows that are heavily driven by whether the movie is a “hit”, which is often difficult to predict. 	Debt should be <ol style="list-style-type: none"> 1. Short term 2. Primarily dollar debt. 3. If possible, tied to the success of movies. (Lion King or Nemo Bonds)
Broadcasting	Projects are likely to be <ol style="list-style-type: none"> 1. Short term 2. Primarily in dollars, though foreign component is growing 3. Driven by advertising revenues and show success 	Debt should be <ol style="list-style-type: none"> 1. Short term 2. Primarily dollar debt 3. If possible, linked to network ratings.
Theme Parks	Projects are likely to be <ol style="list-style-type: none"> 1. Very long term 2. Primarily in dollars, but a significant proportion of revenues come from foreign tourists, who are likely to stay away if the dollar strengthens 3. Affected by success of movie and broadcasting divisions. 	Debt should be <ol style="list-style-type: none"> 1. Long term 2. Mix of currencies, based upon tourist make up.
Consumer Products	Projects are likely to be short to medium term and linked to the success of the movie division. Most of Disney’s product offerings are derived from their movie productions.	Debt should be <ol style="list-style-type: none"> a. Medium term b. Dollar debt.

⌚ 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
 - Duration (long term or short term)
 - Currency
 - Fixed or Floating rate
 - Straight or Convertible

II. Project Specific Financing

- 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

<i>Year</i>	<i>Annual Cashflow</i>	<i>Terminal Value</i>	<i>Present Value</i>	<i>Present value *t</i>
0	-\$2,000		-\$2,000	\$0
1	-\$1,000		-\$904	-\$904
2	-\$833		-\$680	-\$1,361
3	-\$224		-\$165	-\$496
4	\$417		\$278	\$1,112
5	\$559		\$337	\$1,684
6	\$614		\$334	\$2,006
7	\$658		\$324	\$2,265
8	\$726		\$323	\$2,582
9	\$802		\$322	\$2,899
10	\$837	\$9,857	\$3,882	\$38,821
			\$2,050	\$48,609
	Duration =	$48609/2050 = 23.71$ years		

The perfect theme park debt...

- The perfect debt for this theme park would have a duration of roughly 23.71 years and be in a mix of Asian currencies, 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

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. In particular, you can look at

1. 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.

2. 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

<i>Period</i>	<i>Operating Income</i>	<i>Firm value</i>
2003	\$2,713	\$68,239
2002	\$2,384	\$53,708
2001	\$2,832	\$45,030
2000	\$2,525	\$47,717
1999	\$3,580	\$88,558
1998	\$3,843	\$65,487
1997	\$3,945	\$64,236
1996	\$3,024	\$65,489
1995	\$2,262	\$54,972
1994	\$1,804	\$33,071
1993	\$1,560	\$22,694
1992	\$1,287	\$25,048
1991	\$1,004	\$17,122
1990	\$1,287	\$14,963
1989	\$1,109	\$16,015
1988	\$789	\$9,195
1987	\$707	\$8,371
1986	\$281	\$5,631
1985	\$206	\$3,655
1984	\$143	\$2,024
1983	\$134	\$1,817
1982	\$141	\$2,108

The Macroeconomic Data

<i>Period</i>	<i>T.Bond Rate</i>	<i>Change in rate</i>	<i>GDP (Deflated)</i>	<i>% Chg in GDP</i>	<i>CPI</i>	<i>Change in CPI</i>	<i>Weighted Dollar</i>	<i>% Change in \$</i>
2003	4.29%	0.40%	10493	3.60%	2.04%	0.01%	88.82	-14.51%
2002	3.87%	-0.82%	10128	2.98%	2.03%	-0.10%	103.9	-3.47%
2001	4.73%	-1.20%	9835	-0.02%	2.13%	-1.27%	107.64	1.85%
2000	6.00%	0.30%	9837	3.53%	3.44%	0.86%	105.68	11.51%
1999	5.68%	-0.21%	9502	4.43%	2.56%	1.05%	94.77	-0.59%
1998	5.90%	-0.19%	9099	3.70%	1.49%	-0.65%	95.33	0.95%
1997	6.10%	-0.56%	8774	4.79%	2.15%	-0.82%	94.43	7.54%
1996	6.70%	0.49%	8373	3.97%	2.99%	0.18%	87.81	4.36%
1995	6.18%	-1.32%	8053	2.46%	2.81%	0.19%	84.14	-1.07%
1994	7.60%	2.11%	7860	4.30%	2.61%	-0.14%	85.05	-5.38%
1993	5.38%	-0.91%	7536	2.25%	2.75%	-0.44%	89.89	4.26%
1992	6.35%	-1.01%	7370	3.50%	3.20%	0.27%	86.22	-2.31%
1991	7.44%	-1.24%	7121	-0.14%	2.92%	-3.17%	88.26	4.55%
1990	8.79%	0.47%	7131	1.68%	6.29%	1.72%	84.42	-11.23%
1989	8.28%	-0.60%	7013	3.76%	4.49%	0.23%	95.10	4.17%
1988	8.93%	-0.60%	6759	4.10%	4.25%	-0.36%	91.29	-5.34%
1987	9.59%	2.02%	6493	3.19%	4.63%	3.11%	96.44	-8.59%
1986	7.42%	-2.58%	6292	3.11%	1.47%	-1.70%	105.50	-15.30%
1985	10.27%	-1.11%	6102	3.39%	3.23%	-0.64%	124.56	-10.36%
1984	11.51%	-0.26%	5902	4.18%	3.90%	-0.05%	138.96	8.01%
1983	11.80%	1.20%	5665	6.72%	3.95%	-0.05%	128.65	4.47%
1982	10.47%	-3.08%	5308	-1.61%	4%	-4.50%	123.14	6.48%

I. Sensitivity to Interest Rate Changes

- 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

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

$$\text{Change in Firm Value} = 0.2081 \quad - 4.16 \text{ (Change in Interest Rates)}$$

(2.91) (0.75)

T statistics are in brackets.

- The coefficient on the regression (-4.16) measures how much the value of Disney as a firm changes for a unit change in interest rates.

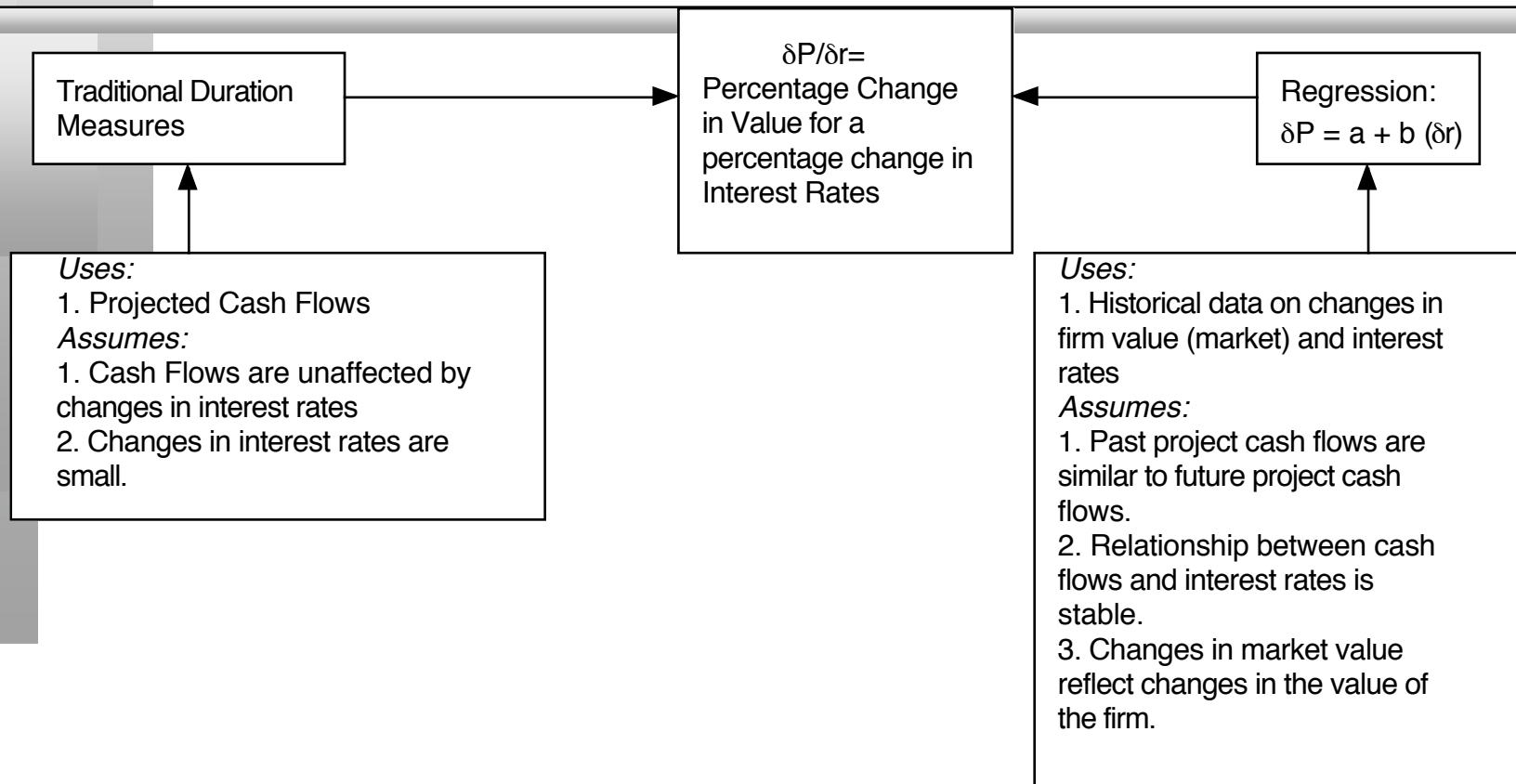
Why the coefficient on the regression is duration..

- 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



Operating Income versus Interest Rates

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

$$\text{Change in Operating Income} = 0.2189 + 6.59 (\text{Change in Interest Rates})$$

(2.74) (1.06)

- Conclusion: Disney's operating income,un like its firm value, has moved with interest rates.
- Generally speaking, the operating cash flows are smoothed out more than the value and hence will exhibit lower duration that the firm value.

II. Sensitivity to Changes in GDP/ GNP

- 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

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

$$\text{Change in Firm Value} = 0.2165 + 0.26 (\text{GDP Growth})$$

(1.56) (0.07)

- Conclusion: Disney is not very sensitive to economic growth

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

$$\text{Change in Operating Income} = 0.1725 + 0.66 (\text{GDP Growth})$$

(1.10) (0.15)

- Conclusion: Disney's operating income is not sensitive to economic growth either.

III. Sensitivity to Currency Changes

- 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

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

$$\begin{array}{rcl} \text{Change in Firm Value} = & 0.2060 & -2.04 \text{ (Change in Dollar)} \\ & (3.40) & (2.52) \end{array}$$

- Conclusion: Disney's value is sensitive to exchange rate changes, decreasing as the dollar strengthens.

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

$$\begin{array}{rcl} \text{Change in Operating Income} = & 0.1768 & -1.76 \text{ (Change in Dollar)} \\ & (2.42) & (1.81) \end{array}$$

- Conclusion: Disney's operating income is also impacted by the dollar. A stronger dollar seems to hurt operating income.

IV. Sensitivity to Inflation

- 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

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

$$\begin{array}{l} \text{Change in Firm Value} = \quad 0.2262 \quad + 0.57 \text{ (Change in Inflation Rate)} \\ \quad \quad \quad \quad \quad \quad (3.22) \quad \quad (0.13) \end{array}$$

Conclusion: Disney's firm value does not seem to be affected too much by changes in the inflation rate.

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

$$\begin{array}{l} \text{Change in Operating Income} = 0.2192 \quad +9.27 \text{ (Change in Inflation Rate)} \\ \quad \quad \quad \quad \quad \quad (3.01) \quad \quad (1.95) \end{array}$$

Conclusion: Disney's operating income seems to increase in periods when inflation increases. However, this increase in operating income seems to be offset by the increase in discount rates leading to a much more muted effect on value.

Summarizing...

- Looking at the four macroeconomic regressions, we would conclude that
 - Disney's assets have a duration of 4.17 years
 - Disney is not a cyclical firm
 - 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

	Coefficients on firm value regression				Disney Weights
	Interest Rate s	GDP Growth	Inflation	Currency	
Movie s	-3.70	0.56	1.41	-1.23	25.62%
Theme Parks	-6.47	0.22	-1.45	-3.21	20.09%
Broadcasting	-4.50	0.70	-3.05	-1.58	49.25%
Consumer Products	-4.88	0.13	-5.51	-3.01	5.04%
Disney	-4.71	0.54	-1.71	-1.89	100%

Recommendations for Disney

- The debt issued should be long term and should have duration of between 4 and 5 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 2003 numbers at least, this would indicate that about 20% of the debt should be in Euros and about 10% of the debt in Japanese Yen reflecting Disney's larger exposures in Europe and Asia. 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 \$13.1 billion in debt with an average maturity of 11.53 years. Even allowing for the fact that the maturity of debt is higher than the duration, this would indicate that Disney's debt is far too long term for its existing business mix.
- Of the debt, about 12% is Euro debt and no yen denominated debt. Based upon our analysis, a larger portion of Disney's debt should be in foreign currencies.
- Disney has about \$1.3 billion in convertible debt and some floating rate debt, though no information is provided on its magnitude. If floating rate debt is a relatively small portion of existing debt, our analysis would indicate that Disney should be using more of it.

Adjusting Debt at Disney

- It can swap some of its existing long term, fixed rate, dollar debt with shorter term, 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 short term, floating rate, foreign currency debt to fund these new investments. While it may be mismatching the funding on these investments, its debt matching will become better at the company level.