Applied Corporate Finance

Aswath Damodaran

What is corporate finance?

- Every decision that a business makes has financial implications, and any decision which affects the finances of a business is a corporate finance decision.
- Defined broadly, everything that a business does fits under the rubric of corporate finance.

First Principles

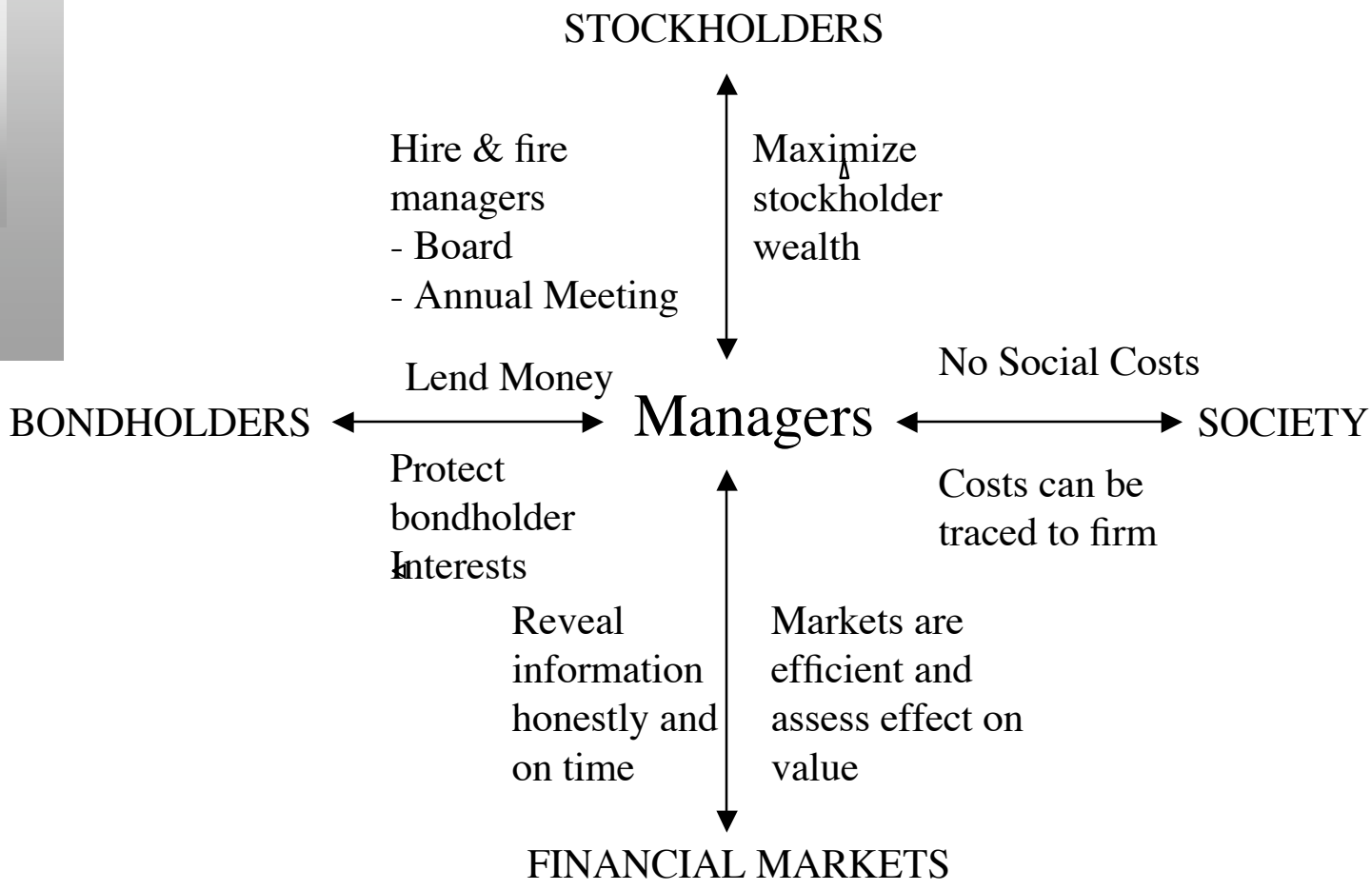
- Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt)
  - Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.
- Choose a financing mix that minimizes the hurdle rate and matches the assets being financed.
- If there are not enough investments that earn the hurdle rate, return the cash to stockholders.
  - The form of returns - dividends and stock buybacks - will depend upon the stockholders' characteristics.

Objective: Maximize the Value of the Firm

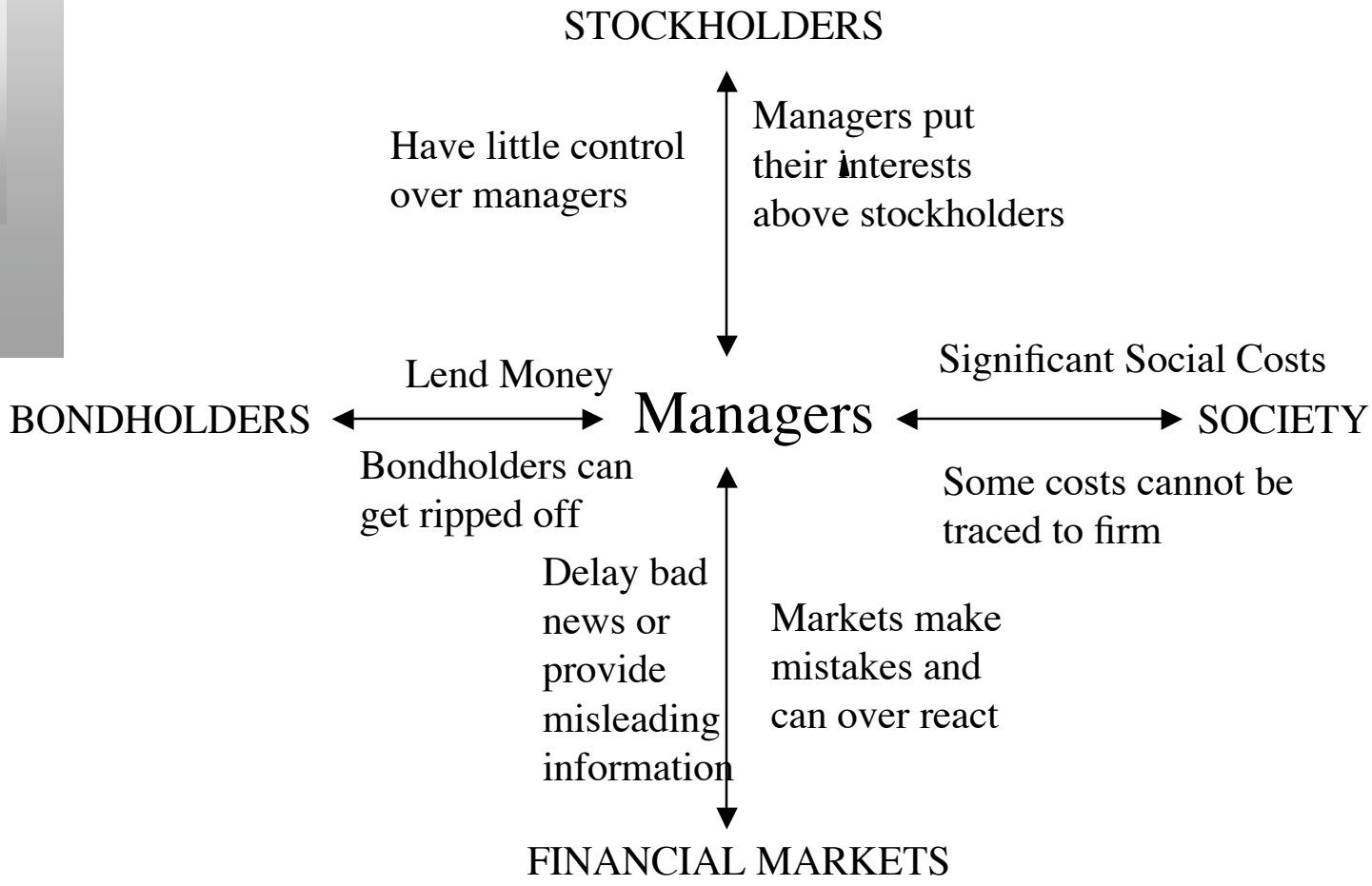
The Objective in Decision Making

- In traditional corporate finance, the objective in decision making is to maximize the value of the firm.
- A narrower objective is to maximize stockholder wealth. When the stock is traded and markets are viewed to be efficient, the objective is to maximize the stock price.
- All other goals of the firm are intermediate ones leading to firm value maximization, or operate as constraints on firm value maximization.

The Classical Objective Function



What can go wrong?



Who's on Board? The Disney Experience - 1997

Reveta F. Bowers 1,5
Head of School
Center for Early Education

Roy E . Disney 3
Vice Chairman
The Walt Disney Company

Michael D. Eisner 3
Chairman and Chief Executive Officer
The Walt Disney Company

Stanley P. Gold 4,5
President and Chief Executive Officer
Shamrock Holdings, Inc.

Sanford M. Litvack
Senior Executive Vice President
and Chief of Corporate Operations
The Walt Disney Company

Ignacio E. Lozano, Jr. 1,2,4
Editor-in-Chief, LA OPINION

George J. Mitchell 5
Special Counsel
Verner, Liipfert, Bernard, McPherson
and Hand

Thomas S. Murphy
Former Chairman
Capital Cities/ABC, Inc.

Richard A. Nunis
Chairman
Walt Disney Attractions

Leo J. O'Donovan, S.J.
President
Georgetown University

Michael S. Ovitz 3
President
The Walt Disney Company

Sidney Poitier 2,4
Chief Executive Officer
Verdon-Cedric Productions

Irwin E. Russell 2,4
Attorney at Law

Robert A.M. Stern
Senior Partner Productions

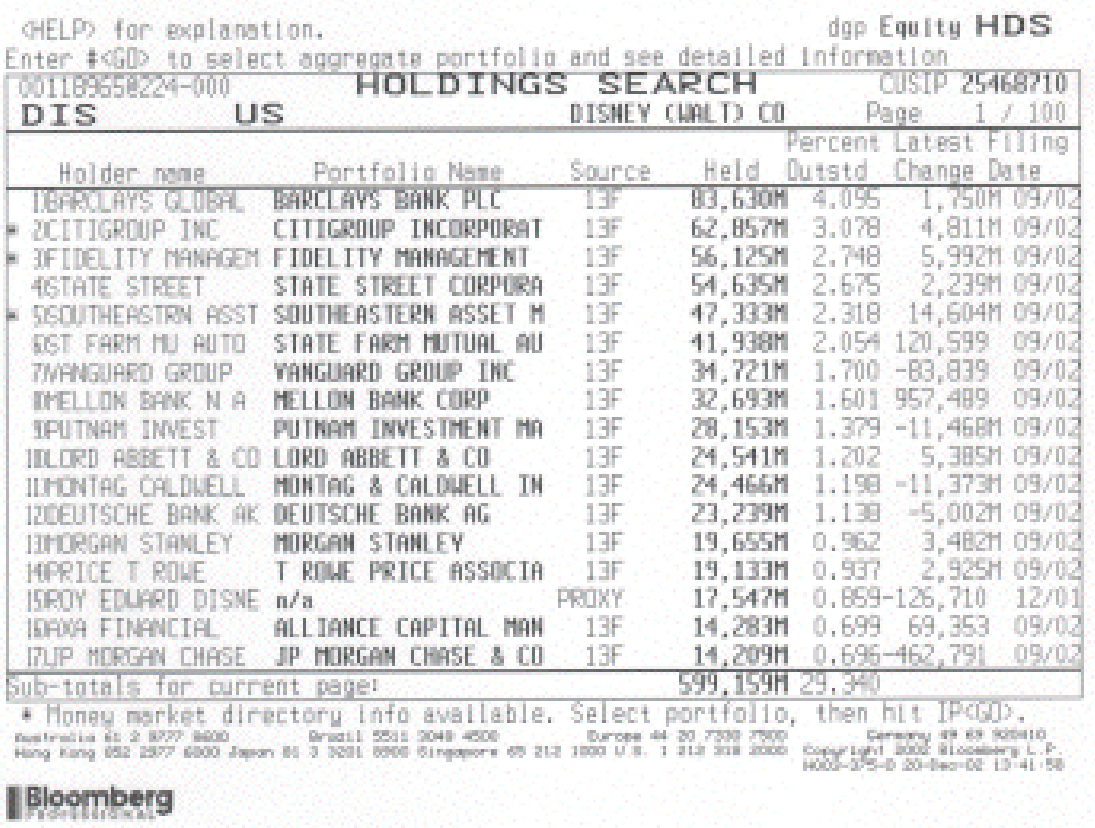
E. Cardon Walker 1
Former Chairman and Chief Executive Officer
The Walt Disney Company

Raymond L. Watson 1,2,3
Vice Chairman
The Irvine Company

Gary L. Wilson 5
Co-Chairman
Northwest Airlines Corporation

1 Member of Audit Review Committee
2 Member of Compensation Committee
3 Member of Executive Committee
4 Member of Executive Performance Plan Committee
5 Member of Nominating Committee

Disney's top stockholders in 2003



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Enter #<GO> to select aggregate portfolio and see detailed information

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DIS US DISNEY (WALT) CO Page 1 / 100

	Holder name	Portfolio Name	Source	Held	Percent Outstd	Latest Change	Filing Date
1	BARCLAYS GLOBAL	BARCLAYS BANK PLC	13F	83,630M	4.095	1,750M	09/02
* 2	CITIGROUP INC	CITIGROUP INCORPORAT	13F	62,857M	3.078	4,811M	09/02
* 3	FIDELITY MANAGEM	FIDELITY MANAGEMENT	13F	56,125M	2.748	5,992M	09/02
4	STATE STREET	STATE STREET CORPORA	13F	54,635M	2.675	2,239M	09/02
* 5	SOUTHEASTRN ASST	SOUTHEASTERN ASSET M	13F	47,333M	2.318	14,604M	09/02
6	ST FARM MU AUTO	STATE FARM MUTUAL AU	13F	41,938M	2.054	120,599	09/02
7	VANGUARD GROUP	VANGUARD GROUP INC	13F	34,721M	1.700	-83,839	09/02
8	MELLON BANK N A	MELLON BANK CORP	13F	32,693M	1.601	957,489	09/02
9	PUTNAM INVEST	PUTNAM INVESTMENT MA	13F	28,153M	1.379	-11,468M	09/02
10	LORD ABBETT & CO	LORD ABBETT & CO	13F	24,541M	1.202	5,385M	09/02
11	MONTAG CALDWELL	MONTAG & CALDWELL IN	13F	24,466M	1.198	-11,373M	09/02
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* Money market directory info available. Select portfolio, then hit IP<GO>.

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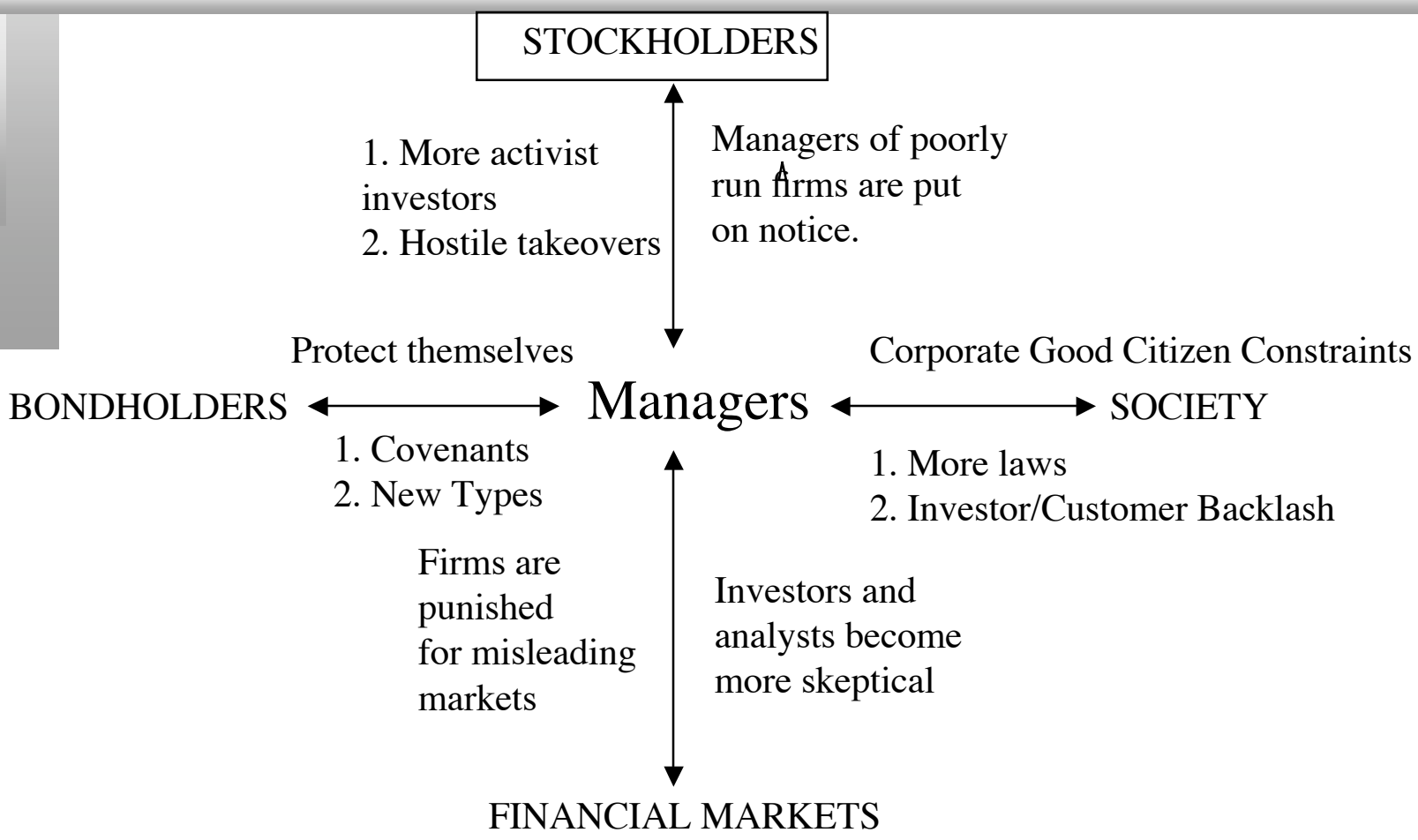
When traditional corporate financial theory breaks down, the solution is:

- To choose a different mechanism for corporate governance
- To choose a different objective for the firm.
- To maximize stock price, but reduce the potential for conflict and breakdown:
  - Making managers (decision makers) and employees into stockholders
  - By providing information honestly and promptly to financial markets

The Counter Reaction



Disney's Board in 2003

Board Members	*Occupation*
Reveta Bowers	Head of school for the Center for Early Education,
John Bryson	CEO and Chairman of Con Edison
Roy Disney	Head of Disney Animation
Michael Eisner	CEO of Disney
Judith Estrin	CEO of Packet Design (an internet company)
Stanley Gold	CEO of Shamrock Holdings
Robert Iger	Chief Operating Officer, Disney
Monica Lozano	Chief Operation Officer, La Opinion (Spanish newspaper)
George Mitchell	Chairman of law firm (Verner, Liipfert, et al.)
Thomas S. Murphy	Ex-CEO, Capital Cities ABC
Leo O'Donovan	Professor of Theology, Georgetown University
Sidney Poitier	Actor, Writer and Director
Robert A.M. Stern	Senior Partner of Robert A.M. Stern Architects of New York
Andrea L. Van de Kamp	Chairman of Sotheby's West Coast
Raymond L. Watson	Chairman of Irvine Company (a real estate corporation)
Gary L. Wilson	Chairman of the board, Northwest Airlines.

First Principles

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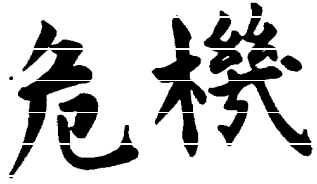
Objective: Maximize the Value of the Firm

What is Risk?

- Risk, in traditional terms, is viewed as a 'negative'. Webster's dictionary, for instance, defines risk as "exposing to danger or hazard". The Chinese symbols for risk, reproduced below, give a much better description of risk

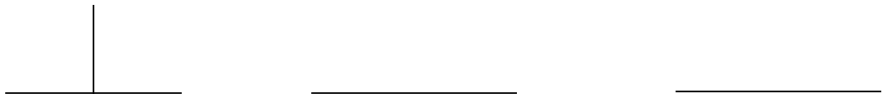


- The first symbol is the symbol for "danger", while the second is the symbol for "opportunity", making risk a mix of danger and opportunity.

Risk and Return Models in Finance…

Step 1: Defining Risk

The risk in an investment can be measured by the variance in actual returns around an expected return



Step 2: Differentiating between Rewarded and Unrewarded Risk

Risk that is specific to investment (Firm Specific)
Can be diversified away in a diversified portfolio
1. each investment is a small proportion of portfolio
2. risk averages out across investments in portfolio

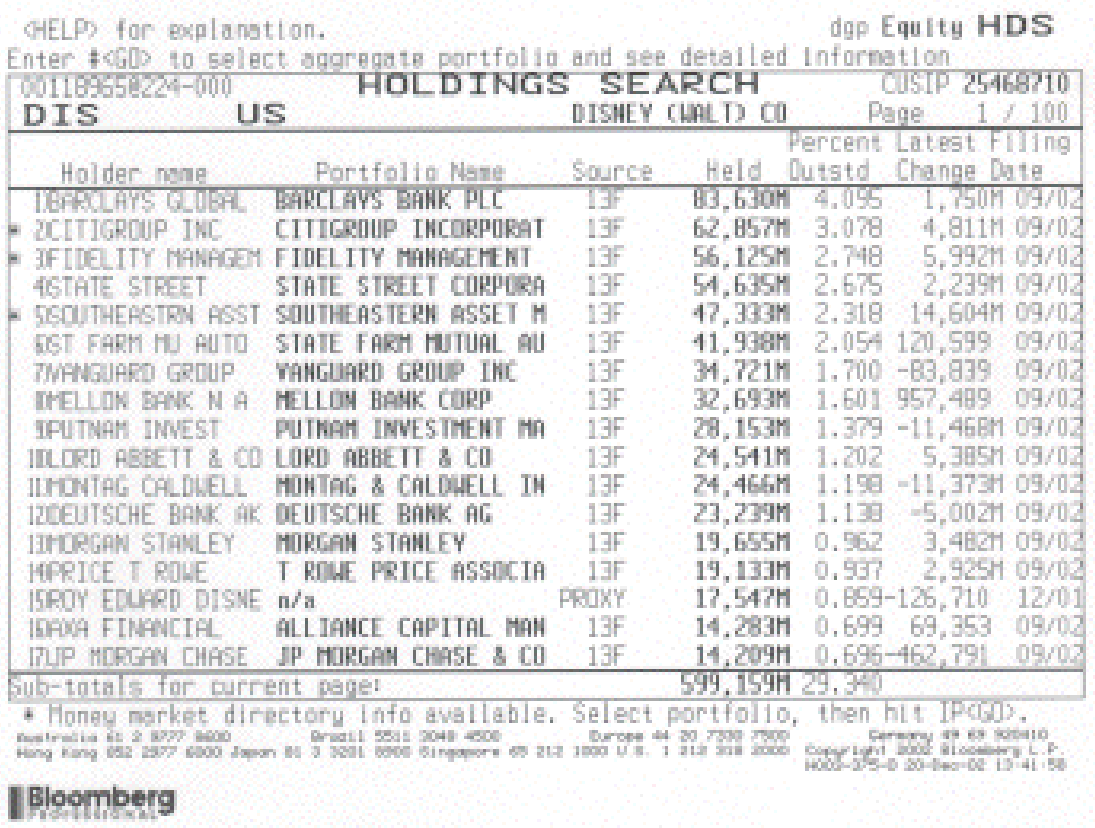
Risk that affects all investments (Market Risk)
Cannot be diversified away since most assets are affected by it.

The marginal investor is assumed to hold a "diversified" portfolio. Thus, only market risk will be rewarded and priced.

Step 3: Measuring Market Risk

The CAPM	**The APM**	**Multi-Factor Models**	**Proxy Models**
If there is 1. no private information 2. no transactions cost the optimal diversified portfolio includes every traded asset. Everyone will hold this market portfolio **Market Risk = Risk added by any investment to the market portfolio:**	If there are no arbitrage opportunities then the market risk of any asset must be captured by betas relative to factors that affect all investments. **Market Risk = Risk exposures of any asset to market factors**	Since market risk affects most or all investments, it must come from macro economic factors. **Market Risk = Risk exposures of any asset to macro economic factors.**	In an efficient market, differences in returns across long periods must be due to market risk differences. Looking for variables correlated with returns should then give us proxies for this risk. **Market Risk = Captured by the Proxy Variable(s)**
Beta of asset relative to Market portfolio (from a regression)	Betas of asset relative to unspecified market factors (from a factor analysis)	Betas of assets relative to specified macro economic factors (from a regression)	Equation relating returns to proxy variables (from a regression)

Who are Disney's marginal investors?



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Inputs required to use the CAPM -

- The capital asset pricing model yields the following expected return:

  Expected Return = Riskfree Rate+ Beta * (Expected Return on the Market Portfolio - Riskfree Rate)

- To use the model we need three inputs:

  (a) The current risk-free rate

  (b) The expected market risk premium (the premium expected for investing in risky assets (market portfolio) over the riskless asset)

  (c) The beta of the asset being analyzed.

The Riskfree Rate

- On a riskfree asset, the actual return is equal to the expected return. Therefore, there is no variance around the expected return.
- For an investment to be riskfree, i.e., to have an actual return be equal to the expected return, two conditions have to be met –
  - There has to be no default risk, which generally implies that the security has to be issued by the government. Note, however, that not all governments can be viewed as default free.
  - There can be no uncertainty about reinvestment rates, which implies that it is a zero coupon security with the same maturity as the cash flow being analyzed.
- In corporate finance, where much of the analysis is long term, the riskfree rate should be a long term, government bond rate (assuming the government is default free)

What is your risk premium?

- Assume that stocks are the only risky assets and that you are offered two investment options:
  - a riskless investment (say a Government Security), on which you can make 5%
  - a mutual fund of all stocks, on which the returns are uncertain

How much of an expected return would you demand to shift your money from the riskless asset to the mutual fund?

a) Less than 5%
b) Between 5 - 7%
c) Between 7 - 9%
d) Between 9 - 11%
e) Between 11- 13%
f) More than 13%

Check your premium against the survey premium on my web site.

The Historical Premium Approach

- This is the default approach used by most to arrive at the premium to use in the model
- In most cases, this approach does the following
  - it defines a time period for the estimation (1926-Present, 1962-Present....)
  - it calculates average returns on a stock index during the period
    - it calculates average returns on a riskless security over the period
      - it calculates the difference between the two
      - and uses it as a premium looking forward
- The limitations of this approach are:
  - it assumes that the risk aversion of investors has not changed in a systematic way across time. (The risk aversion may change from year to year, but it reverts back to historical averages)
  - it assumes that the riskiness of the "risky" portfolio (stock index) has not changed in a systematic way across time.

Historical Average Premiums for the United States

	Arithmetic average		*Geometric Average*	
Historical Period	Stocks - T.Bills	Stocks - T.Bonds	Stocks - T.Bills	Stocks - T.Bonds
1928-2005	7.83%	5.95%	6.47%	4.80%
1964-2005	5.52%	4.29%	4.08%	3.21%
1994-2005	8.80%	7.07%	5.15%	3.76%

What is the right premium?

- Go back as far as you can. Otherwise, the standard error in the estimate will be large. ($$\text{Std Error in estimate} = \frac{\text{Annualized Std deviation in Stock prices}}{\sqrt{\text{Number of years of historical data}}}$$)
- Be consistent in your use of a riskfree rate.
- Use arithmetic premiums for one-year estimates of costs of equity and geometric premiums for estimates of long term costs of equity.

Data Source: Check out the returns by year and estimate your own historical premiums by going to updated data on my web site.

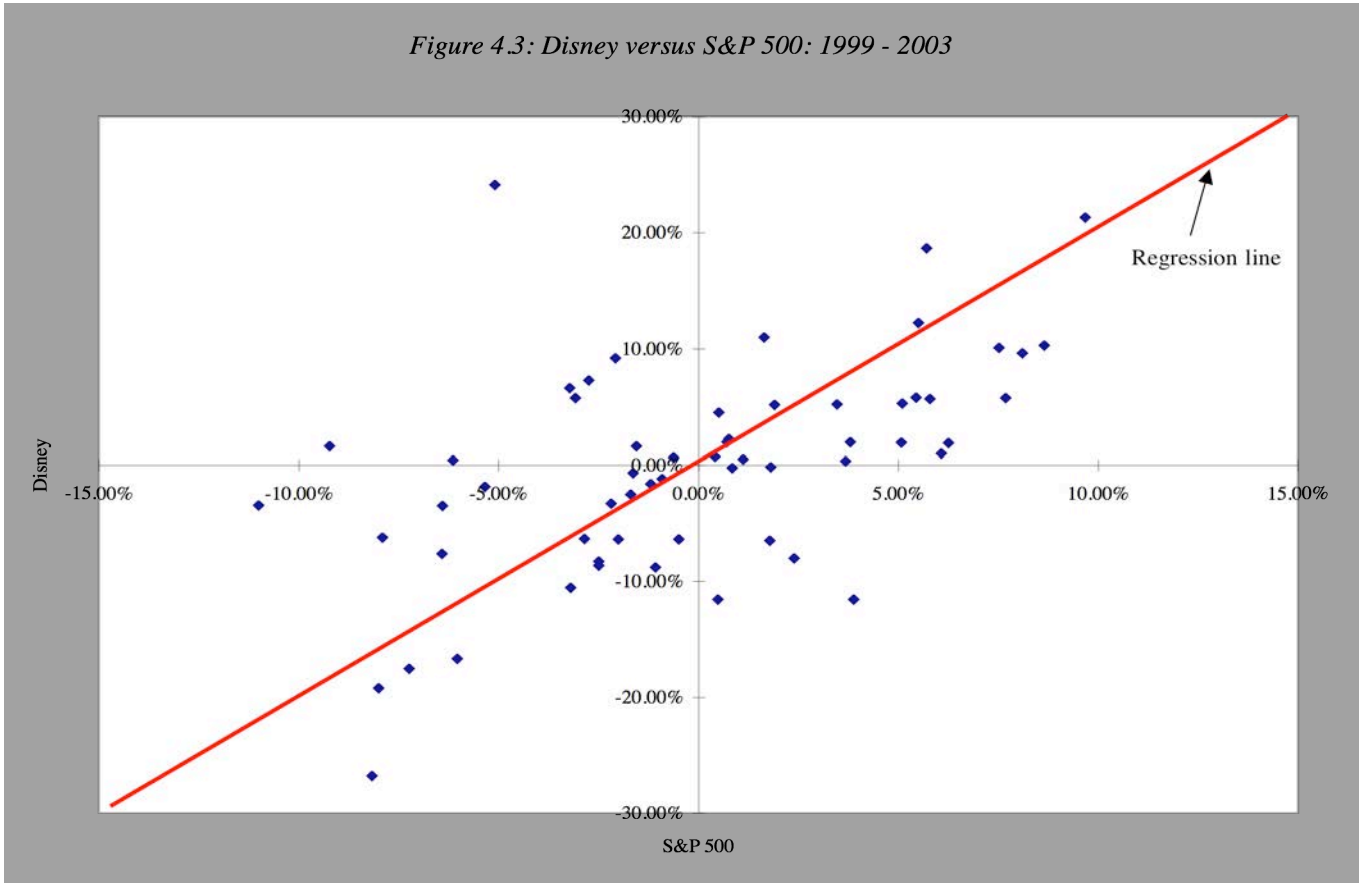
Estimating Beta

- The standard procedure for estimating betas is to regress stock returns (R_j) against market returns (R_m) -

$$R_j = a + b\ R_m$$

  - where a is the intercept and b is the slope of the regression.
- The slope of the regression corresponds to the beta of the stock, and measures the riskiness of the stock.

Disney's Historical Beta



The Regression Output

- Using monthly returns from 1999 to 2003, we ran a regression of returns on Disney stock against the S*P 500. The output is below:

$$\text{Returns}_{\text{Disney}} = 0.0467\% + 1.01\ \text{Returns}_{\text{S \& P 500}} \qquad (R^2 = 29\%)$$
$$(0.20)$$

- Slope of the Regression of 1.01 is the beta. Regression parameters are always estimated with error. The error is captured in the standard error of the beta estimate, which in the case of Disney is 0.20.

Estimating Expected Returns for Disney in September 2004

- Inputs to the expected return calculation
  - Disney's Beta = 1.01
  - Riskfree Rate = 4.00% (U.S. ten-year T.Bond rate)
  - Risk Premium = 4.82% (Approximate historical premium: 1928-2003)
- Expected Return = Riskfree Rate + Beta (Risk Premium)
  = 4.00% + 1.01(4.82%) = 8.87%

How managers use this expected return

- Managers at Disney
  - need to make at least 8.87% as a return for their equity investors to break even.
  - this is the hurdle rate for projects, when the investment is analyzed from an equity standpoint
- In other words, Disney's cost of equity is 8.87%.
- What is the cost of not delivering this cost of equity?

Determinant 1: Product Type

- **Industry Effects**: The beta value for a firm depends upon the sensitivity of the demand for its products and services and of its costs to macroeconomic factors that affect the overall market.
  - Cyclical companies have higher betas than non-cyclical firms
  - Firms which sell more discretionary products will have higher betas than firms that sell less discretionary products

Determinant 2: Operating Leverage Effects

- Operating leverage refers to the proportion of the total costs of the firm that are fixed.
- Other things remaining equal, higher operating leverage results in greater earnings variability which in turn results in higher betas.

Determinant 3: Financial Leverage

- As firms borrow, they create fixed costs (interest payments) that make their earnings to equity investors more volatile.
- This increased earnings volatility which increases the equity beta.
- The beta of equity alone can be written as a function of the unlevered beta and the debt-equity ratio

$\beta_L = \beta_u (1+ ((1-t)D/E))$

where

β_L = Levered or Equity Beta

β_u = Unlevered Beta

t = Corporate marginal tax rate

D = Market Value of Debt

E = Market Value of Equity

Bottom-up versus Top-down Beta

- The top-down beta for a firm comes from a regression
- The bottom up beta can be estimated by doing the following:
  - Find out the businesses that a firm operates in
  - Find the unlevered betas of other firms in these businesses
  - Take a weighted (by sales or operating income) average of these unlevered betas
  - Lever up using the firm's debt/equity ratio
- The bottom up beta will give you a better estimate of the true beta when
  - the standard error of the beta from the regression is high (and) the beta for a firm is very different from the average for the business
  - the firm has reorganized or restructured itself substantially during the period of the regression
  - when a firm is not traded

Disney's business breakdown

Unlevered Beta
(1 - Cash/ Firm Value)

Business	*Comparable firms*	*Number of firms*	*Average levered beta*	*Median D/E*	*Unlevered beta*	*Cash/Firm Value*	*Unlevered beta corrected for cash*
Media Networks	Radia and TV broadcasting companies	24	1.22	20.45%	1.0768	0.75%	1.0850
Parks and Resorts	Theme park & Entertainment firms	9	1.58	120.76%	0.8853	2.77%	0.9105
Studio Entertainment	Movie companies	11	1.16	27.96%	0.9824	14.08%	1.1435
Consumer Products	Toy and apparel retailers; Entertainment software	77	1.06	9.18%	0.9981	12.08%	1.1353

Disney's bottom up beta

$$\text{EV/Sales} = \frac{(\text{Market Value of Equity} + \text{Debt} - \text{Cash})}{\text{Sales}}$$

Business	*Disney's Revenues*	*EV/Sales*	*Estimated Value*	*Firm Value Proportion*	*Unlevered beta*
Media Networks	$10,941	3.41	$37,278.62	49.25%	1.0850
Parks and Resorts	$6,412	2.37	$15,208.37	20.09%	0.9105
Studio Entertainment	$7,364	2.63	$19,390.14	25.62%	1.1435
Consumer Products	$2,344	1.63	$3,814.38	5.04%	1.1353
Disney	$27,061		$75,691.51	100.00%	1.0674

Disney's Cost of Equity

Business	Unlevered Beta	D/E Ratio	Levered Beta	Cost of Equity
Media Networks	1.0850	26.62%	1.2661	10.10%
Parks and Resorts	0.9105	26.62%	1.0625	9.12%
Studio Entertainment	1.1435	26.62%	1.3344	10.43%
Consumer Products	1.1353	26.62%	1.3248	10.39%
Disney	1.0674	26.62%	1.2456	10.00%

What is debt?

- General Rule: Debt generally has the following characteristics:
  - Commitment to make fixed payments in the future
  - The fixed payments are tax deductible
  - Failure to make the payments can lead to either default or loss of control of the firm to the party to whom payments are due.
- As a consequence, debt should include
  - Any interest-bearing liability, whether short term or long term.
  - Any lease obligation, whether operating or capital.

Estimating the Cost of Debt

- If the firm has bonds outstanding, and the bonds are traded, the yield to maturity on a long-term, straight (no special features) bond can be used as the interest rate.
- If the firm is rated, use the rating and a typical default spread on bonds with that rating to estimate the cost of debt.
- If the firm is not rated,
  - and it has recently borrowed long term from a bank, use the interest rate on the borrowing or
  - estimate a synthetic rating for the company, and use the synthetic rating to arrive at a default spread and a cost of debt
- The cost of debt has to be estimated in the same currency as the cost of equity and the cash flows in the valuation.

Estimating Synthetic Ratings

- The rating for a firm can be estimated using the financial characteristics of the firm. In its simplest form, the rating can be estimated from the interest coverage ratio

  Interest Coverage Ratio = EBIT / Interest Expenses

- For a firm, which has earnings before interest and taxes of $ 3,500 million and interest expenses of $ 700 million

  Interest Coverage Ratio = 3,500/700= 5.00

- In 2003, Disney had operating income of $ 2,805 million and interest & lease expenses of $758 million. The resulting interest coverage ratio is 3.70.
  - Interest coverage ratio = 2,805/758 = 3.70

Interest Coverage Ratios, Ratings and Default Spreads: Small Companies

Interest Coverage Ratio	Rating	Typical default spread	Market interest rate on debt
> 8.5	AAA	0.35%	4.35%
6.50 - 6.50	AA	0.50%	4.50%
5.50 – 6.50	A+	0.70%	4.70%
4.25 – 5.50	A	0.85%	4.85%
3.00 – 4.25	A-	1.00%	5.00%
2.50 – 3.00	BBB	1.50%	5.50%
2.05 - 2.50	BB+	2.00%	6.00%
1.90 – 2.00	BB	2.50%	6.50%
1.75 – 1.90	B+	3.25%	7.25%
1.50 - 1.75	B	4.00%	8.00%
1.25 – 1.50	B-	6.00%	10.00%
0.80 – 1.25	CCC	8.00%	12.00%
0.65 – 0.80	CC	10.00%	14.00%
0.20 – 0.65	C	12.00%	16.00%
< 0.20	D	20.00%	24.00%

Estimating Cost of Debt

- Disney's synthetic rating is A-…. It has an actual rating of BBB+, yielding a default spread of 1.25%. The two ratings are close but we will go with the actual rating.

  Cost of Debt for Disney = 4% + 1.25% = 5.25%

- Interest is tax deductible and Disney has a marginal tax rate of 37.3% (reflecting both state and federal taxes). The after-tax cost of debt is

  After-tax cost of debt = 5.25% (1-.373) = 3.29%

Weights for Cost of Capital Calculation

- The weights used in the cost of capital computation should be market values.
- There are three specious arguments used against market value
  - *Book value is more reliable than market value because it is not as volatile*: While it is true that book value does not change as much as market value, this is more a reflection of weakness than strength
  - *Using book value rather than market value is a more conservative approach to estimating debt ratios:* For most companies, using book values will yield a lower cost of capital than using market value weights.
  - *Since accounting returns are computed based upon book value, consistency requires the use of book value in computing cost of capital:* While it may seem consistent to use book values for both accounting return and cost of capital calculations, it does not make economic sense.

Current Cost of Capital: Disney

- Equity
  - Cost of Equity = Riskfree rate + Beta * Risk Premium
    = 4% + 1.25 (4.82%) = 10.00%
  - Market Value of Equity = $55.101 Billion
  - Equity/(Debt+Equity) = 79%
- Debt
  - After-tax Cost of debt =(Riskfree rate + Default Spread) (1-t)
    = (4%+1.25%) (1-.373) = 3.29%
  - Market Value of Debt = $ 14.668 Billion
  - Debt/(Debt +Equity) = 21%
- Cost of Capital = 10.00%(.79)+3.29%(.21) = 8.59%

55.101(55.101+14.668)

First Principles

- Invest in projects that yield a **return** greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt)
  - **Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.**
- Choose a financing mix that minimizes the hurdle rate and matches the assets being financed.
- If there are not enough investments that earn the hurdle rate, return the cash to stockholders.
  - The form of returns - dividends and stock buybacks - will depend upon the stockholders' characteristics.

Measures of return: earnings versus cash flows

- Principles Governing Accounting Earnings Measurement
  - Accrual Accounting: Show revenues when products and services are sold or provided, not when they are paid for. Show expenses associated with these revenues rather than cash expenses.
  - Operating versus Capital Expenditures: Only expenses associated with creating revenues in the current period should be treated as operating expenses. Expenses that create benefits over several periods are written off over multiple periods (as depreciation or amortization)
- To get from accounting earnings to cash flows:
  - you have to add back non-cash expenses (like depreciation)
  - you have to subtract out cash outflows which are not expensed (such as capital expenditures)
  - you have to make accrual revenues and expenses into cash revenues and expenses (by considering changes in working capital).

Measuring Returns Right: The Basic Principles

- Use cash flows rather than earnings. You cannot spend earnings.
- Use "incremental" cash flows relating to the investment decision, i.e., cashflows that occur as a consequence of the decision, rather than total cash flows.
- Use "time weighted" returns, i.e., value cash flows that occur earlier more than cash flows that occur later.

The Return Mantra: "Time-weighted, Incremental Cash Flow Return"

Analyzing a Disney Theme Park

- The theme parks to be built near Bangkok, modeled on Euro Disney in Paris, will include a "Magic Kingdom" to be constructed, beginning immediately, and becoming operational at the beginning of the second year, and a second theme park modeled on Epcot Center at Orlando to be constructed in the second and third year and becoming operational at the beginning of the fifth year.
- The earnings and cash flows are estimated in nominal U.S. Dollars.

Estimating a hurdle rate for the theme park

- We did estimate a cost of equity of 9.12% for the Disney theme park business in the last chapter, using a bottom-up levered beta of 1.0625 for the business.
- This cost of equity may not adequately reflect the additional risk associated with the theme park being in an emerging market.
- To counter this risk, we compute the cost of equity for the theme park using a risk premium that includes a 3.3% country risk premium for Thailand:
  - Cost of Equity in US $= 4% + 1.0625 (4.82% + 3.30%) = 12.63%
  - Cost of Capital in US $ = 12.63% (.7898) + 3.29% (.2102) = 10.66%

Earnings on Project

	Now (0)	1	2	3	4	5	6	7	8	9	10
Magic Kingdom		$0	$1,000	$1,400	$1,700	$2,000	$2,200	$2,420	$2,662	$2,928	$2,987
Second Theme Park		$0	$0	$0	$300	$500	$550	$605	$666	$732	$747
Resort & Properties		$0	$250	$350	$500	$625	$688	$756	$832	$915	$933
Total Revenues			*$1,250*	*$1,750*	*$2,500*	*$3,125*	*$3,438*	*$3,781*	*$4,159*	*$4,575*	*$4,667*
Magic Kingdom: Operating Expenses		$0	$600	$840	$1,020	$1,200	$1,320	$1,452	$1,597	$1,757	$1,792
Epcot II: Operating Expenses		$0	$0	$0	$180	$300	$330	$363	$399	$439	$448
Resort & Property: Operating Expenses		$0	$188	$263	$375	$469	$516	$567	$624	$686	$700
Depreciation & Amortization		$0	$537	$508	$430	$359	$357	$358	$361	$366	$369
Allocated G&A Costs		$0	$188	$263	$375	$469	$516	$567	$624	$686	$700
Operating Income		*$0*	*-$262*	*-$123*	*$120*	*$329*	*$399*	*$473*	*$554*	*$641*	*$657*
Taxes		$0	-$98	-$46	$45	$123	$149	$177	$206	$239	$245
Operating Income after Taxes			-$164	-$77	$75	$206	$250	$297	$347	$402	$412

And the Accounting View of Return

Year	After-tax Operating Income	BV of Capital: Beginning	BV of Capital: Ending	Average BV of Capital	ROC
1	$0	$2,500	$3,500	$3,000	NA
2	-$165	$3,500	$4,294	$3,897	-4.22%
3	-$77	$4,294	$4,616	$4,455	-1.73%
4	$75	$4,616	$4,524	$4,570	1.65%
5	$206	$4,524	$4,484	$4,504	4.58%
6	$251	$4,484	$4,464	$4,474	5.60%
7	$297	$4,464	$4,481	$4,472	6.64%
8	$347	$4,481	$4,518	$4,499	7.72%
9	$402	$4,518	$4,575	$4,547	8.83%
10	$412	$4,575	$4,617	$4,596	8.97%
	$175			$4,301	4.23%

Would lead us to conclude that...

- Do not invest in this park. The **return on capital of 4.23%** is lower than the **cost of capital for theme parks of 10.66%**; This would suggest that the project should not be taken.
- Given that we have computed the average over an arbitrary period of 10 years, while the theme park itself would have a life greater than 10 years, would you feel comfortable with this conclusion?
  a) Yes
  b) No

The cash flow view of this project..

	0	1	2	3	4	5	6
Operating Income after Taxes			-$165	-$77	$75	$206	$251
+ Depreciation & Amortization			$537	$508	$430	$359	$357
- Capital Expenditures	$2,500	$1,000	$1,269	$805	$301	$287	$321
- Change in Working Capital	$0	$0	$63	$25	$38	$31	$16
Cashflow to Firm	-$2,500	-$1,000	-$960	-$399	$166	$247	$271

To get from income to cash flow, we

- added back all non-cash charges such as depreciation
- subtracted out the capital expenditures
- subtracted out the change in non-cash working capital

The incremental cash flows on the project

$ 500 million has already been spent

	Now (0)	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Operating Income after Taxes			-$165	-$77	$75	$206	$251	$297	$347	$402	$412
+ Depreciation & Amortization			$537	$508	$430	$359	$357	$358	$361	$366	$369
- Capital Expenditures	$2,500	$1,000	$1,269	$805	$301	$287	$321	$358	$379	$403	$406
- Change in Working Capital	$0	$0	$63	$25	$38	$31	$16	$17	$19	$21	$5
+ Non-incremental Allocated Expense (1-t)		$0	$78	$110	$157	$196	$216	$237	$261	$287	$293
+ Sunk Costs	500										
Cashflow to Firm	-$2,000	-$1,000	-$880	-$289	$324	$443	$486	$517	$571	$631	$663

2/3rd of allocated G&A is fixed.
Add back this amount (1-t)

To get from cash flow to incremental cash flows, we

- Taken out of the sunk costs from the initial investment
- Added back the non-incremental allocated costs (in after-tax terms)

Discounted cash flow measures of return

- **Net Present Value (NPV)**: The net present value is the sum of the present values of all cash flows from the project (including initial investment).

  NPV = Sum of the present values of all cash flows on the project, including the initial investment, with the cash flows being discounted at the appropriate hurdle rate (cost of capital, if cash flow is cash flow to the firm, and cost of equity, if cash flow is to equity investors)

  - Decision Rule: Accept if NPV > 0
- **Internal Rate of Return (IRR)**: The internal rate of return is the discount rate that sets the net present value equal to zero. It is the percentage rate of return, based upon incremental time-weighted cash flows.
  - Decision Rule: Accept if IRR > hurdle rate

Closure on Cash Flows

- In a project with a finite and short life, you would need to compute a **salvage value**, which is the expected proceeds from selling all of the investment in the project at the end of the project life. It is usually set equal to book value of fixed assets and working capital
- In a project with an infinite or very long life, we compute cash flows for a reasonable period, and then compute a **terminal value** for this project, which is the present value of all cash flows that occur after the estimation period ends..
- Assuming the project lasts forever, and that cash flows after year 10 grow 2% (the inflation rate) forever, the present value at the end of year 10 of cash flows after that can be written as:
  - Terminal Value in year 10= CF in year 11/(Cost of Capital - Growth Rate)
    =663 (1.02) /(.1066-.02) = $ 7,810 million

Which yields a NPV of..

Year	Annual Cashflow	Terminal Value	Present Value
0	-$2,000		-$2,000
1	-$1,000		-$904
2	-$880		-$719
3	-$289		-$213
4	$324		$216
5	$443		$267
6	$486		$265
7	$517		$254
8	$571		$254
9	$631		$254
10	$663	$7,810	$3,076
			$749

Which makes the argument that..

- **The project should be accepted**. The positive net present value suggests that the project will add value to the firm, and earn a return in excess of the cost of capital.
- By taking the project, Disney will increase its value as a firm by $749 million.

Side Costs and Benefits

- Most projects considered by any business create side costs and benefits for that business.
- The side costs include the costs created by the use of resources that the business already owns (opportunity costs) and lost revenues for other projects that the firm may have.
- The benefits that may not be captured in the traditional capital budgeting analysis include project synergies (where cash flow benefits may accrue to other projects) and options embedded in projects (including the options to delay, expand or abandon a project).
- The returns on a project should incorporate these costs and benefits.

First Principles

- Invest in projects that yield a **return** greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt)
  - **Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.**
- Choose a financing mix that minimizes the hurdle rate and matches the assets being financed.
- If there are not enough investments that earn the hurdle rate, return the cash to stockholders.
  - The form of returns - dividends and stock buybacks - will depend upon the stockholders' characteristics.

Debt: Summarizing the Trade Off

Advantages of Borrowing

1. Tax Benefit:

Higher tax rates --> Higher tax benefit

2. Added Discipline:

Greater the separation between managers and stockholders --> Greater the benefit

Disadvantages of Borrowing

1. Bankruptcy Cost:

Higher business risk --> Higher Cost

2. Agency Cost:

Greater the separation between stock-holders & lenders --> Higher Cost

3. Loss of Future Financing Flexibility:

Greater the uncertainty about future financing needs --> Higher Cost

A Hypothetical Scenario

- Assume you operate in an environment, where
  - (a) there are no taxes
  - (b) there is no separation between stockholders and managers.
  - (c) there is no default risk
  - (d) there is no separation between stockholders and bondholders
  - (e) firms know their future financing needs

The Miller-Modigliani Theorem

- In an environment, where there are no taxes, default risk or agency costs, capital structure is irrelevant.
- The value of a firm is independent of its debt ratio.

The Cost of Capital Approach

- Value of a Firm = Present Value of Cash Flows to the Firm, discounted back at the cost of capital.
- If the cash flows to the firm are held constant, and the cost of capital is minimized, the value of the firm will be maximized.

Current Cost of Capital: Disney

- Equity
  - Cost of Equity = Riskfree rate + Beta * Risk Premium
    = 4% + 1.25 (4.82%) = 10.00%
  - Market Value of Equity = $55.101 Billion
  - Equity/(Debt+Equity) = 79%
- Debt
  - After-tax Cost of debt =(Riskfree rate + Default Spread) (1-t)
    = (4%+1.25%) (1-.373) = 3.29%
  - Market Value of Debt = $ 14.668 Billion
  - Debt/(Debt +Equity) = 21%
- Cost of Capital = 10.00%(.79)+3.29%(.21) = 8.59%

55.101(55.101+14.668)

Mechanics of Cost of Capital Estimation

1. Estimate the Cost of Equity at different levels of debt:
   - Equity will become riskier -> Beta will increase -> Cost of Equity will increase.
   - Estimation will use levered beta calculation
2. Estimate the Cost of Debt at different levels of debt:
   - Default risk will go up and bond ratings will go down as debt goes up -> Cost of Debt will increase.
   - To estimating bond ratings, we will use the interest coverage ratio (EBIT/Interest expense)
3. Estimate the Cost of Capital at different levels of debt
4. Calculate the effect on Firm Value and Stock Price.

Estimating Cost of Equity

Unlevered Beta = 1.0674 (Bottom up beta based upon Disney's businesses)

Market premium = 4.82% T.Bond Rate = 4.00% Tax rate=37.3%

Debt Ratio	*D/E Ratio*	*Levered Beta*	*Cost of Equity*
0.00%	0.00%	1.0674	9.15%
10.00%	11.11%	1.1418	9.50%
20.00%	25.00%	1.2348	9.95%
30.00%	42.86%	1.3543	10.53%
40.00%	66.67%	1.5136	11.30%
50.00%	100.00%	1.7367	12.37%
60.00%	150.00%	2.0714	13.98%
70.00%	233.33%	2.6291	16.67%
80.00%	400.00%	3.7446	22.05%
90.00%	900.00%	7.0911	38.18%

Bond Ratings, Cost of Debt and Debt Ratios

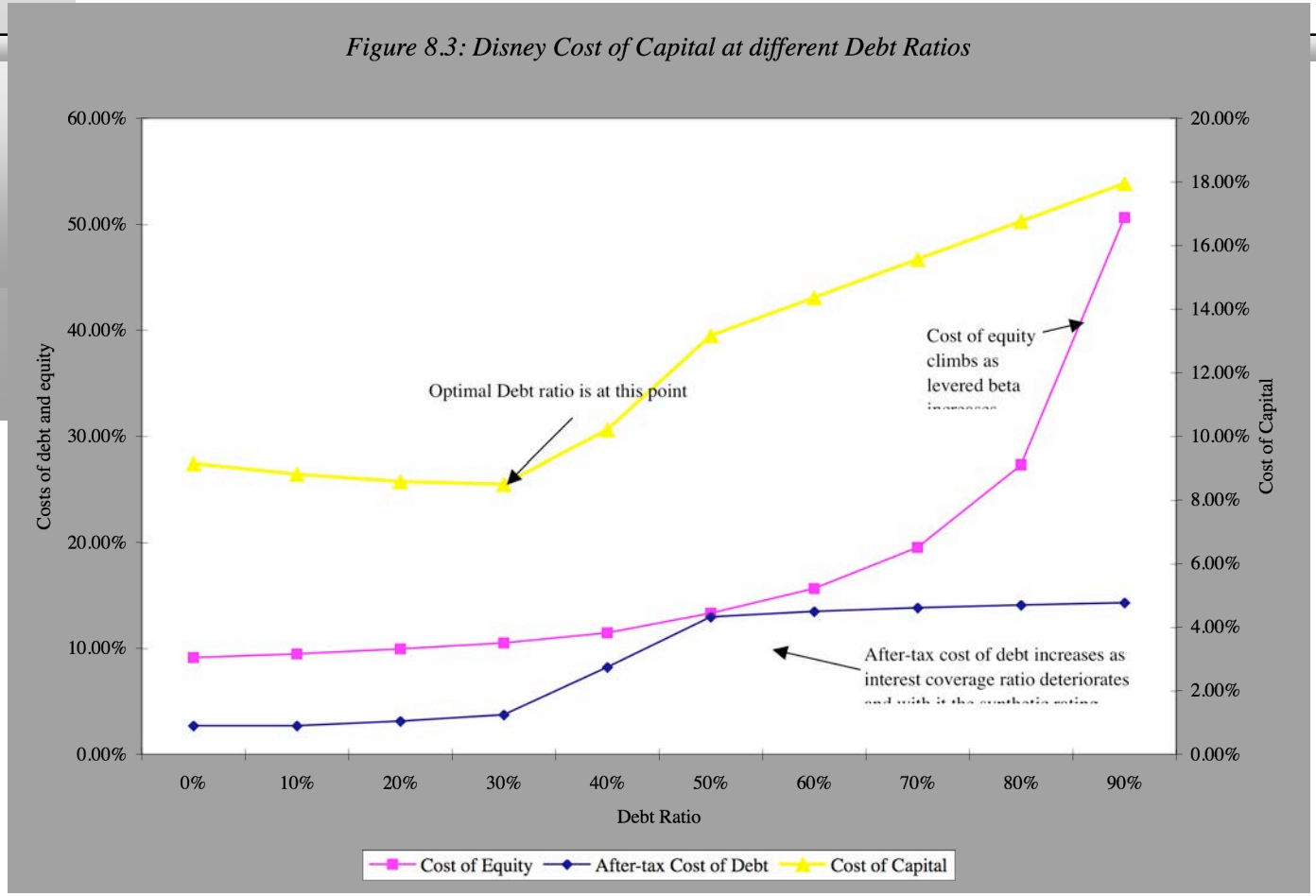
Debt Ratio	Debt	Interest expense	Interest Coverage Ratio	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)
0%	$0	$0	∞	AAA	4.35%	37.30%	2.73%
10%	$6,977	$303	9.24	AAA	4.35%	37.30%	2.73%
20%	$13,954	$698	4.02	A-	5.00%	37.30%	3.14%
30%	$20,931	$1,256	2.23	BB+	6.00%	37.30%	3.76%
40%	$27,908	$3,349	0.84	CCC	12.00%	31.24%	8.25%
50%	$34,885	$5,582	0.50	C	16.00%	18.75%	13.00%
60%	$41,861	$6,698	0.42	C	16.00%	15.62%	13.50%
70%	$48,838	$7,814	0.36	C	16.00%	13.39%	13.86%
80%	$55,815	$8,930	0.31	C	16.00%	11.72%	14.13%
90%	$62,792	$10,047	0.28	C	16.00%	10.41%	14.33%

Disney's Cost of Capital Schedule

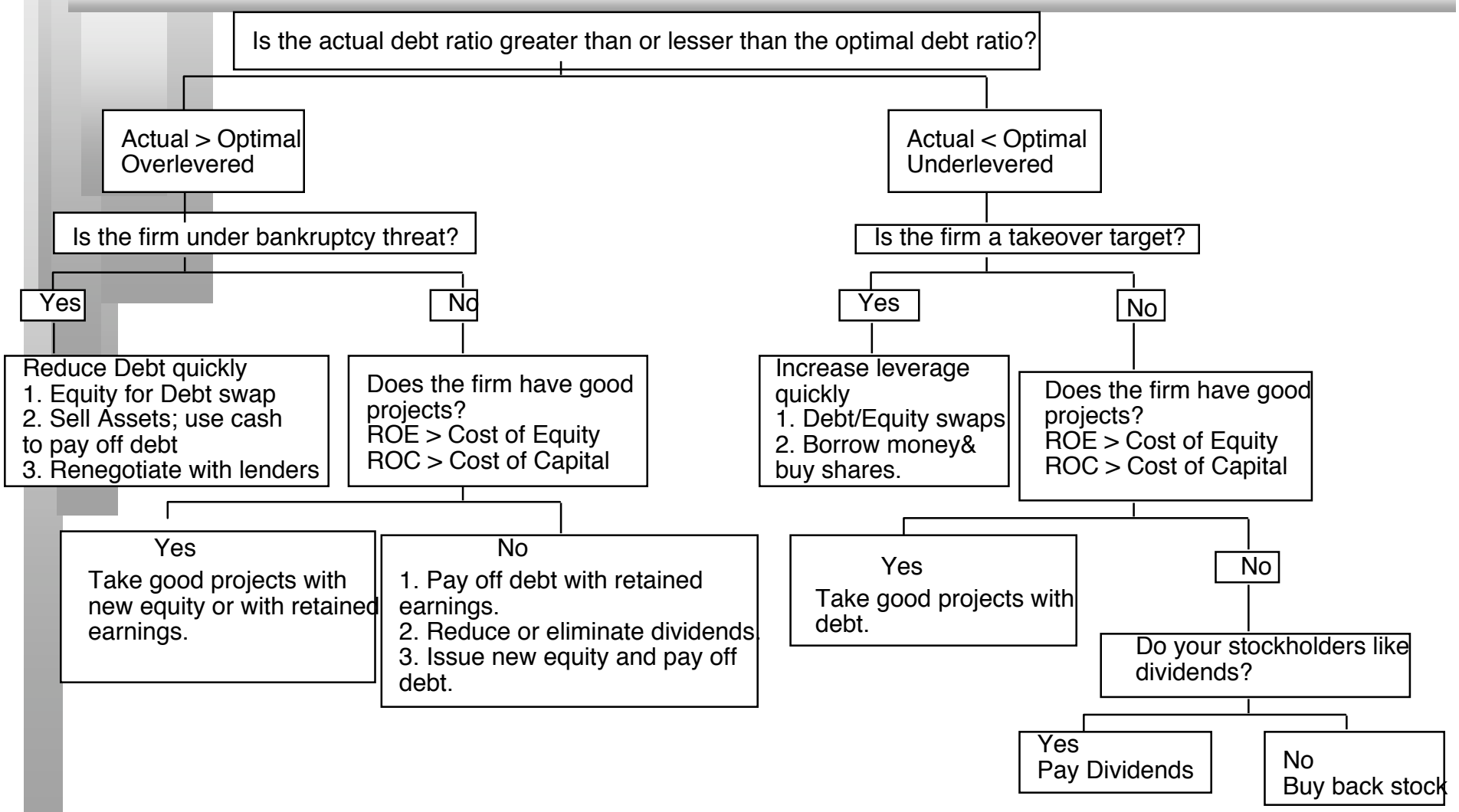
Debt Ratio	Cost of Equity	Cost of Debt (after-tax)	Cost of Capital
0%	9.15%	2.73%	9.15%
10%	9.50%	2.73%	8.83%
20%	9.95%	3.14%	8.59%
30%	10.53%	3.76%	8.50%
40%	11.50%	8.25%	10.20%
50%	13.33%	13.00%	13.16%
60%	15.66%	13.50%	14.36%
70%	19.54%	13.86%	15.56%
80%	27.31%	14.13%	16.76%
90%	50.63%	14.33%	17.96%

Disney: Cost of Capital Chart

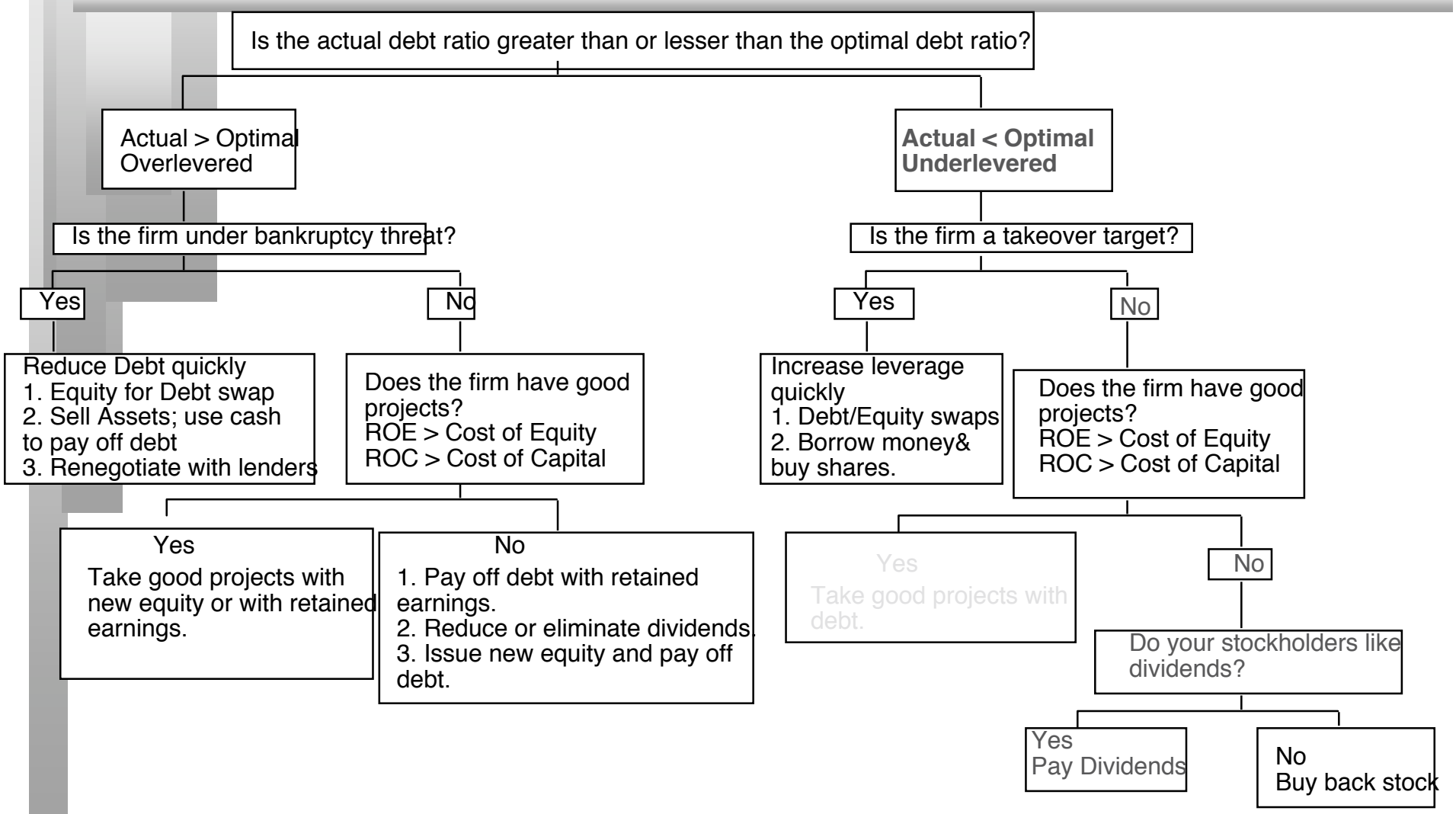
Figure 8.3: Disney Cost of Capital at different Debt Ratios



A Framework for Getting to the Optimal



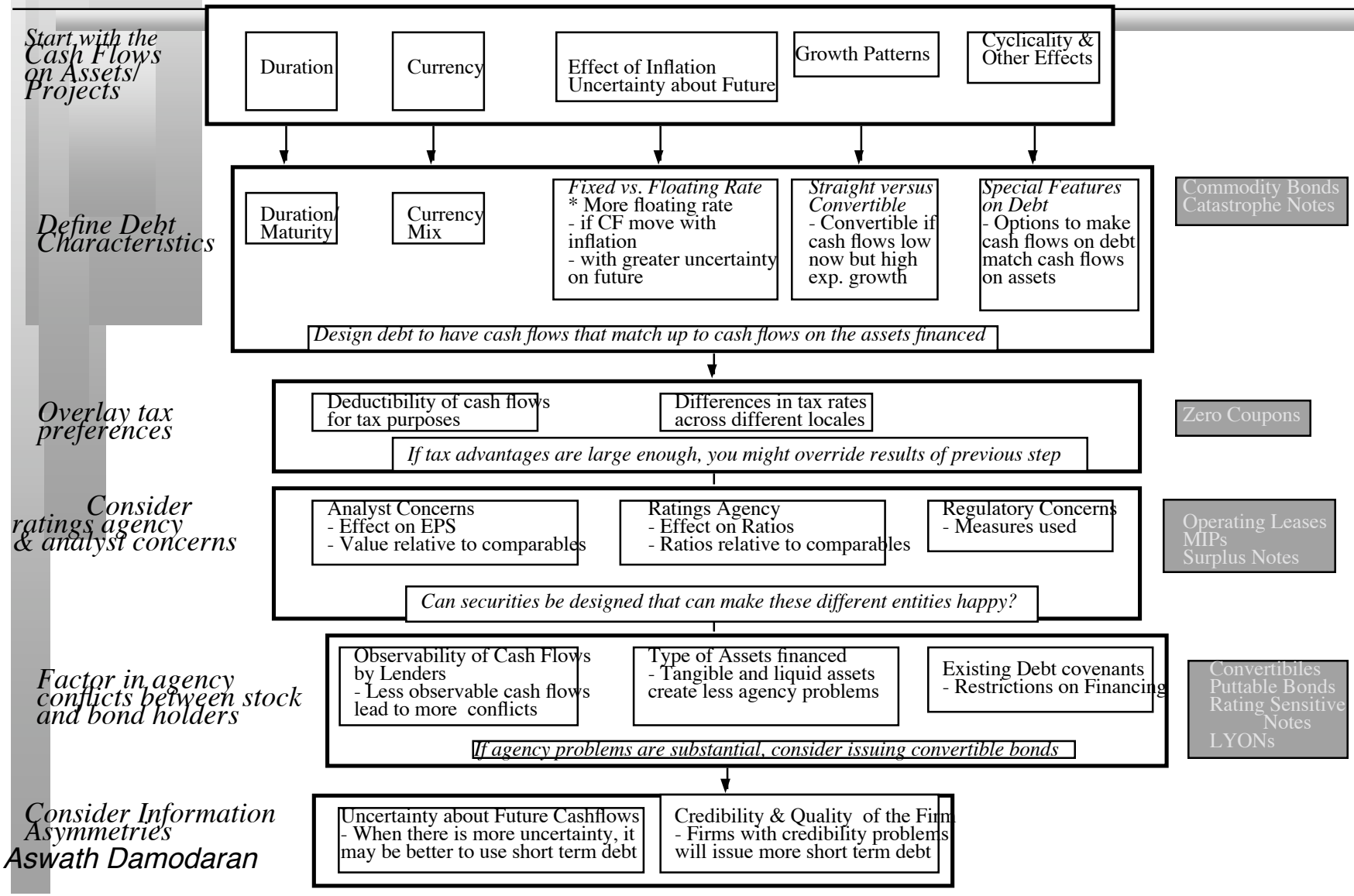
Disney: Applying the Framework



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.

Designing Debt: Bringing it all together



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.

First Principles

- Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt)
  - Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.
- Choose a financing mix that minimizes the hurdle rate and matches the assets being financed.
- If there are not enough investments that earn the hurdle rate, return the cash to stockholders.
  - The form of returns - dividends and stock buybacks - will depend upon the stockholders' characteristics.

Objective: Maximize the Value of the Firm

Assessing Dividend Policy

- Step 1: How much could the company have paid out during the period under question?
- Step 2: How much did the the company actually pay out during the period in question?
- Step 3: How much do I trust the management of this company with excess cash?
  - How well did they make investments during the period in question?
  - How well has my stock performed during the period in question?

A Measure of How Much a Company Could have Afforded to Pay out: FCFE

- The Free Cashflow to Equity (FCFE) is a measure of how much cash is left in the business after non-equity claimholders (debt and preferred stock) have been paid, and after any reinvestment needed to sustain the firm's assets and future growth.

  Net Income

  + Depreciation & Amortization

  = Cash flows from Operations to Equity Investors

  - Preferred Dividends

  - Capital Expenditures

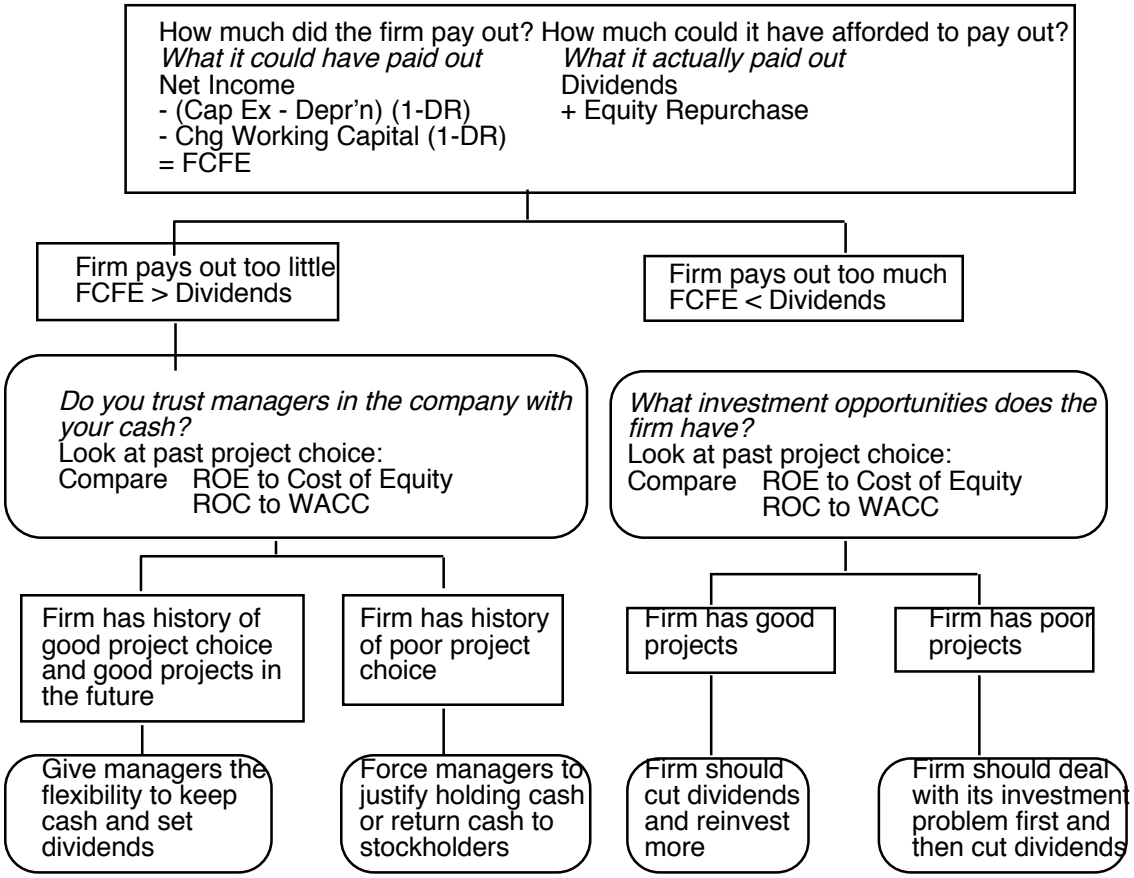
  - Working Capital Needs

  - Principal Repayments

  + Proceeds from New Debt Issues

  = Free Cash flow to Equity

A Practical Framework for Analyzing Dividend Policy



A Dividend Matrix

Dividends paid out relative to FCFE	Quality of projects taken: ROE versus Cost of Equity	
	Poor projects	Good projects
Cash Surplus	*Cash Surplus + Poor Projects* Significant pressure to pay out more to stockholders as dividends or stock buybacks	*Cash Surplus + Good Projects* Maximum flexibility in setting dividend policy
Cash Deficit	*Cash Deficit + Poor Projects* Cut out dividends but real problem is in investment policy.	*Cash Deficit + Good Projects* Reduce cash payout, if any, to stockholders

Disney: An analysis of FCFE from 1994-2003

Year	Net Income	Depreciation	Capital Expenditures	Change in non-cash WC	FCFE (before debt CF)	Net CF from Debt	FCFE (after Debt CF)
1994	$1,110.40	$1,608.30	$1,026.11	$654.10	$1,038.49	$551.10	$1,589.59
1995	$1,380.10	$1,853.00	$896.50	($270.70)	$2,607.30	$14.20	$2,621.50
1996	$1,214.00	$3,944.00	$13,464.00	$617.00	($8,923.00)	$8,688.00	($235.00)
1997	$1,966.00	$4,958.00	$1,922.00	($174.00)	$5,176.00	($1,641.00)	$3,535.00
1998	$1,850.00	$3,323.00	$2,314.00	$939.00	$1,920.00	$618.00	$2,538.00
1999	$1,300.00	$3,779.00	$2,134.00	($363.00)	$3,308.00	($176.00)	$3,132.00
2000	$920.00	$2,195.00	$2,013.00	($1,184.00)	$2,286.00	($2,118.00)	$168.00
2001	($158.00)	$1,754.00	$1,795.00	$244.00	($443.00)	$77.00	($366.00)
2002	$1,236.00	$1,042.00	$1,086.00	$27.00	$1,165.00	$1,892.00	$3,057.00
2003	$1,267.00	$1,077.00	$1,049.00	($264.00)	$1,559.00	($1,145.00)	$414.00
Average	$1,208.55	$2,553.33	$2,769.96	$22.54	$969.38	$676.03	$1,645.41

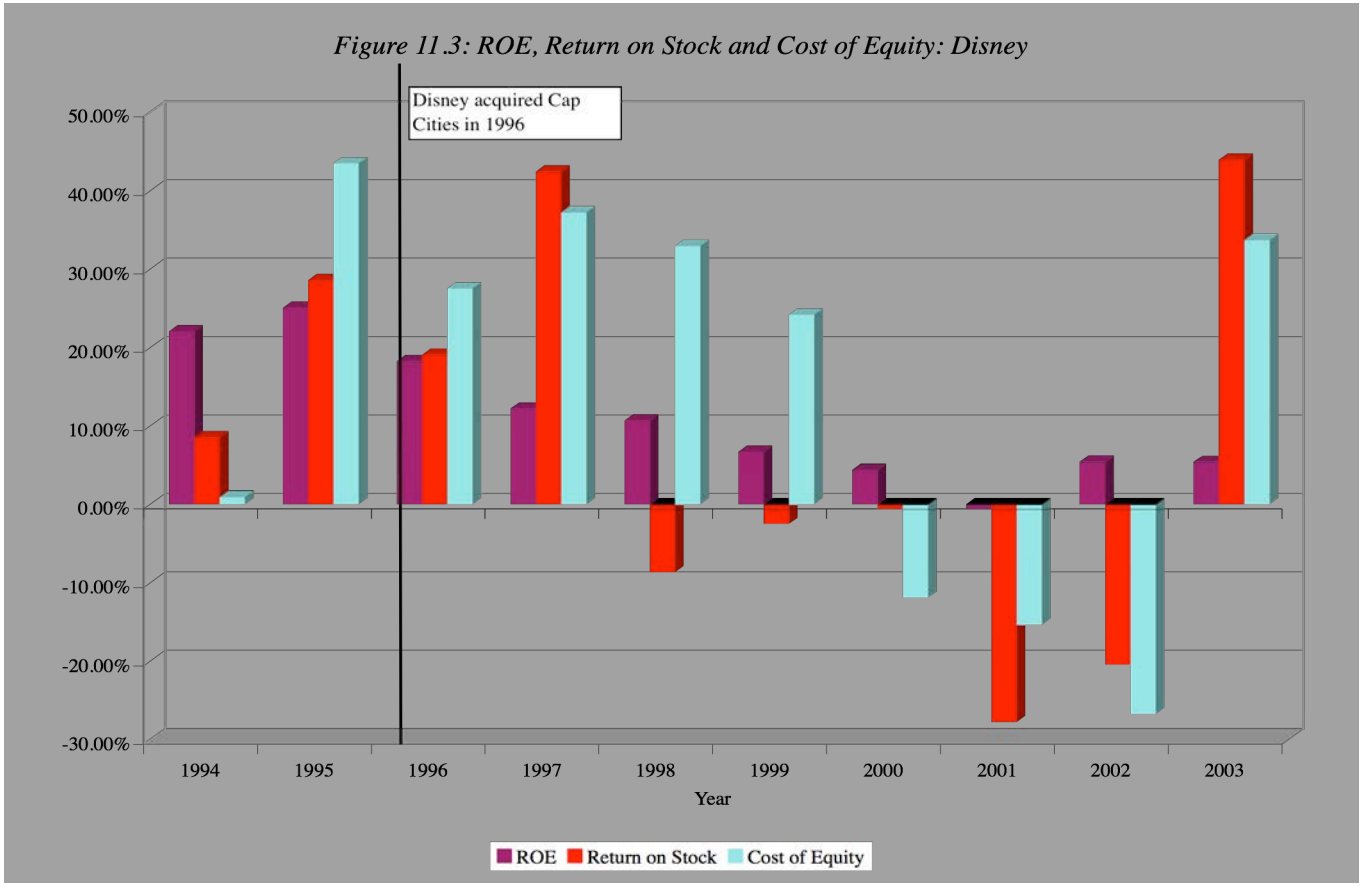
Disney's Dividends and Buybacks from 1994 to 2003

	Disney		
Year	Dividends (in $)	Equity Repurchases (in $)	Cash to Equity
1994	$153	$571	$724
1995	$180	$349	$529
1996	$271	$462	$733
1997	$342	$633	$975
1998	$412	$30	$442
1999	$0	$19	$19
2000	$434	$166	$600
2001	$438	$1,073	$1,511
2002	$428	$0	$428
2003	$429	$0	$429
Average	$ 308.70	$ 330.30	$ 639

Disney: Dividends versus FCFE

- Disney paid out $ 330 million less in dividends (and stock buybacks) than it could afford to pay out (Dividends and stock buybacks wer $639 million; FCFE before net debt issues was $969 million). How much cash do you think Disney accumulated during the period?

Disney's track record on projects and stockholder wealth



Can you trust Disney's management?

- Given Disney's track record over the last 10 years, if you were a Disney stockholder, would you be comfortable with Disney's dividend policy?
  - Yes
  - No

The Bottom Line on Disney Dividends

- Disney could have afforded to pay more in dividends during the period of the analysis.
- It chose not to, and used the cash for acquisitions (Capital Cities/ABC) and ill fated expansion plans (Go.com).
- While the company may have flexibility to set its dividend policy a decade ago, its actions over that decade have frittered away this flexibility.
- Bottom line: Large cash balances will not be tolerated in this company. Expect to face relentless pressure to pay out more dividends.

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- Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
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Objective: Maximize the Value of the Firm

Discounted Cashflow Valuation: Basis for Approach

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

- where,
- n = Life of the asset
- CF_t = Cashflow in period t
- r = Discount rate reflecting the riskiness of the estimated cashflows

Disney: Valuation

Current Cashflow to Firm
EBIT(1-t) : 1,759
- Nt CpX 481
- Chg WC 454
= FCFF $ 824
Reinvestment Rate=(481+454)/1759
= 53.18%

Reinvestment Rate
53.18%%

Return on Capital
12%

Expected Growth in EBIT (1-t)
.5318*.12=.0638
6.38%

Stable Growth
g = 4%; Beta = 1.00;
Cost of capital = 7.16%
ROC= 10%
Reinvestment Rate=g/ROC
=4/ 10= 40%

Terminal Value$_{10}$= 1,904/(.0716-.04) = 60,219

Cashflows

Growth drops to 4%

EBIT (1-t)	$1,871	$1,990	$2,117	$2,252	$2,396	$2,538	$2,675	$2,808	$2,934	$3,051
- Reinvestment	$995	$1,058	$1,126	$1,198	$1,274	$1,283	$1,282	$1,271	$1,251	$1,220
FCFF	$876	$932	$991	$1,055	$1,122	$1,255	$1,394	$1,537	$1,683	$1,831

Term Yr
3089
- 864
= 2225

Op. Assets 35,373
+ Cash: 3,432
+Other Inv
- Debt 14,668
=Equity 24,136
- Options 1,335
=Equity CS 22,802
Value/Sh $11.14

Discount at Cost of Capital (WACC) = 10.00% (.79) + 3.29% (0.21) = 8.59

In transition phase,
debt ratio increases to 30% and cost of capital decreases to 7.16%

Cost of Equity
10%

Cost of Debt
(4.00%+1.25%)(1-.373)
= 3.29%

Weights
E = 79% D = 21%

Riskfree Rate:
Riskfree Rate= 4%

+ **Beta**
1.2456

X **Mature market premium**
4%

Unlevered Beta for Sectors: 1.0674

Firm's D/E Ratio: 24.77%

Disney was trading at ab
$ 26 at the time of this valuation.

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

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 businesss.

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

Existing Investments ROC = 4.22%

New Investments

Return on Capital 12%

Reinvestment Rate 53.18%

Financing Mix D=21%; E= 79%

Financing Choices Fxed rate US $ debt with duration of 11.5 years

Current EBIT (1-t) $ 1,759

Expected Growth Rate = 12% * 53.18% = 6.38%

Cost of capital = 10% (.79) + 3.29% (.21) = 8.59%

Strategic investments determine length of growth period

Year	Expected Growth	EBIT	EBIT (1-t)	Reinvestment Rate	Reinvestment	FCFF	Cost of capital	PV of FCFF
Current		$2,805						
1	6.38%	$2,984	$1,871	53.18%	$994.92	$876.06	8.59%	$806.74
2	6.38%	$3,174	$1,990	53.18%	$1,058.41	$931.96	8.59%	$790.31
3	6.38%	$3,377	$2,117	53.18%	$1,125.94	$991.43	8.59%	$774.22
4	6.38%	$3,592	$2,252	53.18%	$1,197.79	$1,054.70	8.59%	$758.45
5	6.38%	$3,822	$2,396	53.18%	$1,274.23	$1,122.00	8.59%	$743.00
6	5.90%	$4,047	$2,538	50.54%	$1,282.59	$1,255.13	8.31%	$767.42
7	5.43%	$4,267	$2,675	47.91%	$1,281.71	$1,393.77	8.02%	$788.92
8	4.95%	$4,478	$2,808	45.27%	$1,271.19	$1,536.80	7.73%	$807.43
9	4.48%	$4,679	$2,934	42.64%	$1,250.78	$1,682.90	7.45%	$822.90
10	4.00%	$4,866	$3,051	40.00%	$1,220.41	$1,830.62	7.16%	$835.31
Terminal Value						$60,219.11		$27,477.93
						Value of Operating Assets =		$35,372.62
						+ Cash & Non-op Assets =		$3,432.00
						Value of firm		$38,804.62
						- Debt		$14,668.22
						- Options		$1,334.67
						Value of equity in stock =		$22,801.73
						Value per share		$11.14

Disney: Corporate Financing Decisiions and Firm Value

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

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 businesss.

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

Strategic investments determine length of growth period

Existing Investments ROC = **8.59%**

New Investments

Return on Capital **15%**

Reinvestment Rate 53.18%

Financing Mix **D=30%; E= 70%**

Financing Choices Debt in different currencies with duration of 4 years

Current EBIT (1-t) $ 3,417

Expected Growth Rate = 15% * 53.18% = 7.98%

Cost of capital = 10.53% (.70) + 3.45%(.30) = 8.40%

Year	Expected Grow	EBIT	EBIT (1-t)	Reinvestment R	Reinvestment	FCFF	Cost of capital	PV of FCFF
Current		$5,327						
1	7.98%	$5,752	$3,606	53.18%	$1,918	$1,688	8.40%	$1,558
2	7.98%	$6,211	$3,894	53.18%	$2,071	$1,823	8.40%	$1,551
3	7.98%	$6,706	$4,205	53.18%	$2,236	$1,969	8.40%	$1,545
4	7.98%	$7,241	$4,540	53.18%	$2,414	$2,126	8.40%	$1,539
5	7.98%	$7,819	$4,902	53.18%	$2,607	$2,295	8.40%	$1,533
6	7.18%	$8,380	$5,254	50.54%	$2,656	$2,599	8.16%	$1,605
7	6.39%	$8,915	$5,590	47.91%	$2,678	$2,912	7.91%	$1,667
8	5.59%	$9,414	$5,902	45.27%	$2,672	$3,230	7.66%	$1,717
9	4.80%	$9,865	$6,185	42.64%	$2,637	$3,548	7.41%	$1,756
10	4.00%	$10,260	$6,433	40.00%	$2,573	$3,860	7.16%	$1,783
Terminal Value						$126,967		$58,645
						Value of Operating Assets =		$74,900
						+ Cash & Non-op Assets =		$3,432
						Value of firm		$78,332
						- Debt		$14,649
						- Options		$1,335
						Value of equity in stock =		$62,349
						Value per share		$30.45

First Principles

- Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt)
  - Returns on projects should be measured based on cash flows generated and the timing of these cash flows; they should also consider both positive and negative side effects of these projects.
- Choose a financing mix that minimizes the hurdle rate and matches the assets being financed.
- If there are not enough investments that earn the hurdle rate, return the cash to stockholders.
  - The form of returns - dividends and stock buybacks - will depend upon the stockholders' characteristics.

Objective: Maximize the Value of the Firm