Applied Corporate Finance

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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

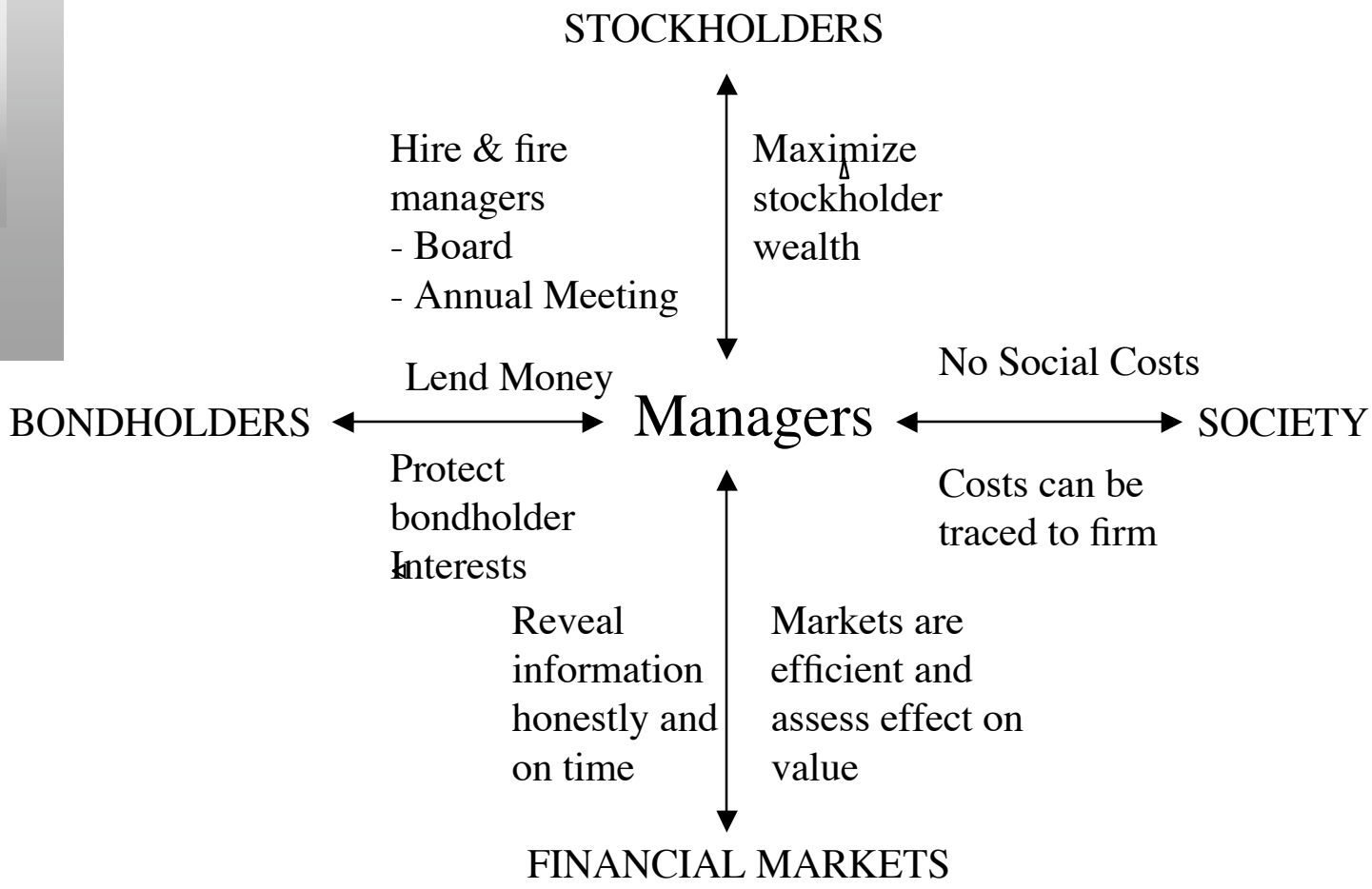
- Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt)
  - Returns on projects should be measured based on cash flows generated 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

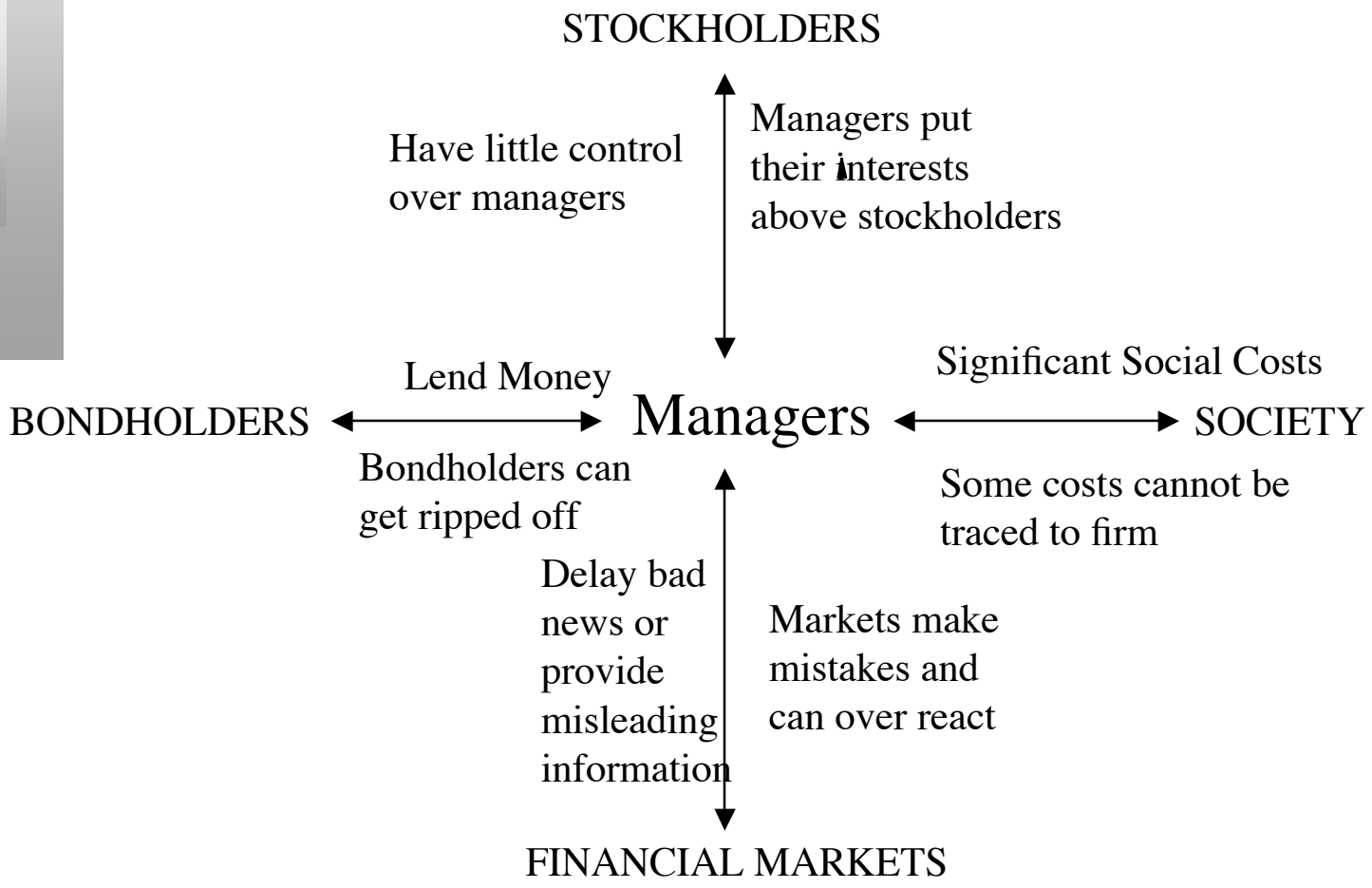
The Objective in Decision Making

- 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

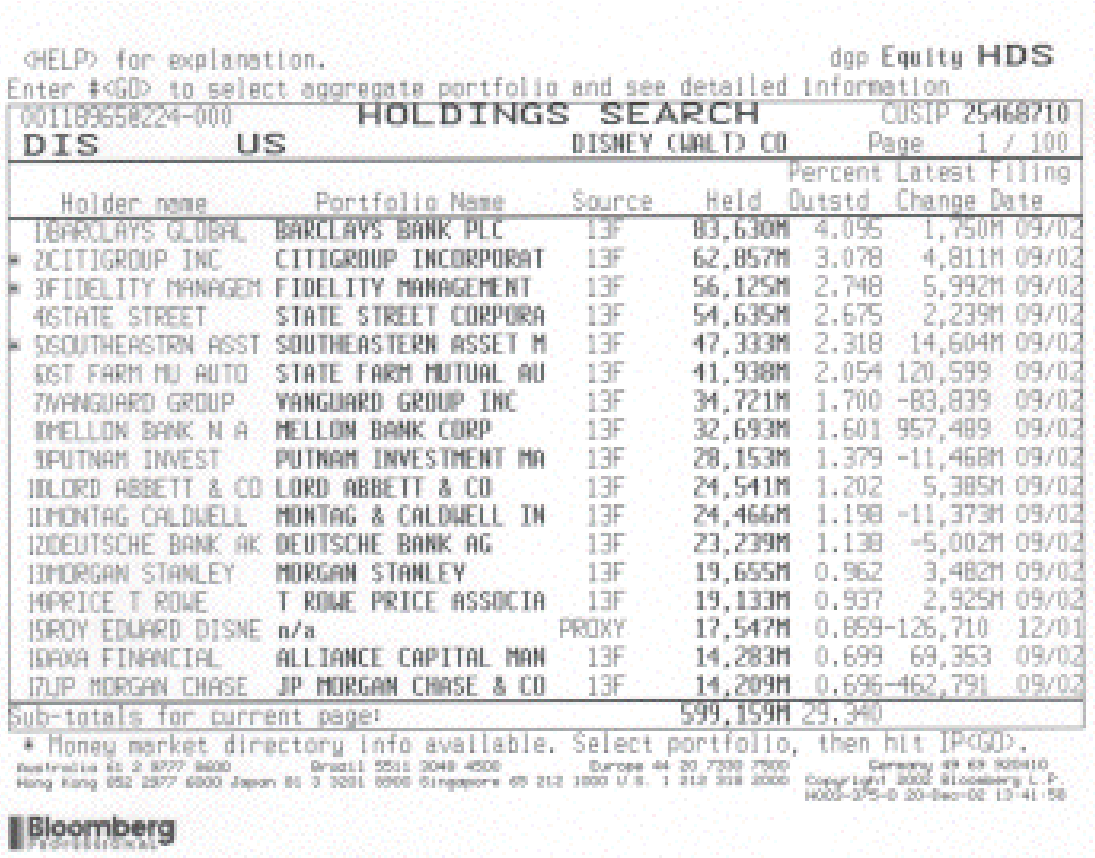
1 Member of Audit Review Committee
2 Member of Compensation Committee
3 Member of Executive Committee
4 Member of Executive Performance Plan Committee
5 Member of Nominating Committee

⧖Application Test: Who owns/runs your firm?

Look at: Bloomberg printout **HDS** for your firm

- Looking at the top 15 stockholders in your firm, are top managers in your firm also large stockholders in the firm?
- Is there any evidence that the top stockholders in the firm play an active role in managing the firm?

Disney's top stockholders in 2003



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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
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* 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
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12	DEUTSCHE BANK AK	DEUTSCHE BANK AG	13F	23,239M	1.138	-5,002M	09/02
13	MORGAN STANLEY	MORGAN STANLEY	13F	19,655M	0.962	3,482M	09/02
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16	AXA FINANCIAL	ALLIANCE CAPITAL MAN	13F	14,283M	0.699	69,353	09/02
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Sub-totals for current page:				599,159M	29.340		

* 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

An Alternative Corporate Governance System

- Germany and Japan developed a different mechanism for corporate governance, based upon corporate cross holdings.
  - In Germany, the banks form the core of this system.
  - In Japan, it is the keiretsus
  - Other Asian countries have modeled their system after Japan, with family companies forming the core of the new corporate families
- At their best, the most efficient firms in the group work at bringing the less efficient firms up to par. They provide a corporate welfare system that makes for a more stable corporate structure
- At their worst, the least efficient and poorly run firms in the group pull down the most efficient and best run firms down. The nature of the cross holdings makes its very difficult for outsiders (including investors in these firms) to figure out how well or badly the group is doing.

Choose a Different Objective Function

- Firms can always focus on a different objective function. Examples would include
  - maximizing earnings
  - maximizing revenues
  - maximizing firm size
  - maximizing market share
  - maximizing EVA
- The key thing to remember is that these are intermediate objective functions.
  - To the degree that they are correlated with the long term health and value of the company, they work well.
  - To the degree that they do not, the firm can end up with a disaster

Maximize Stock Price, subject to ..

- The strength of the stock price maximization objective function is its internal self correction mechanism. Excesses on any of the linkages lead, if unregulated, to counter actions which reduce or eliminate these excesses
- In the context of our discussion,
  - managers taking advantage of stockholders has lead to a much more active market for corporate control.
  - stockholders taking advantage of bondholders has lead to bondholders protecting themselves at the time of the issue.
  - firms revealing incorrect or delayed information to markets has lead to markets becoming more “skeptical” and “punitive”
  - firms creating social costs has lead to more regulations, as well as investor and customer backlashes.

The Stockholder Backlash

- Institutional investors such as Calpers and the Lens Funds have become much more active in monitoring companies that they invest in and demanding changes in the way in which business is done
- Individuals like Michael Price specialize in taking large positions in companies which they feel need to change their ways (Chase, Dow Jones, Readers' Digest) and push for change
- At annual meetings, stockholders have taken to expressing their displeasure with incumbent management by voting against their compensation contracts or their board of directors

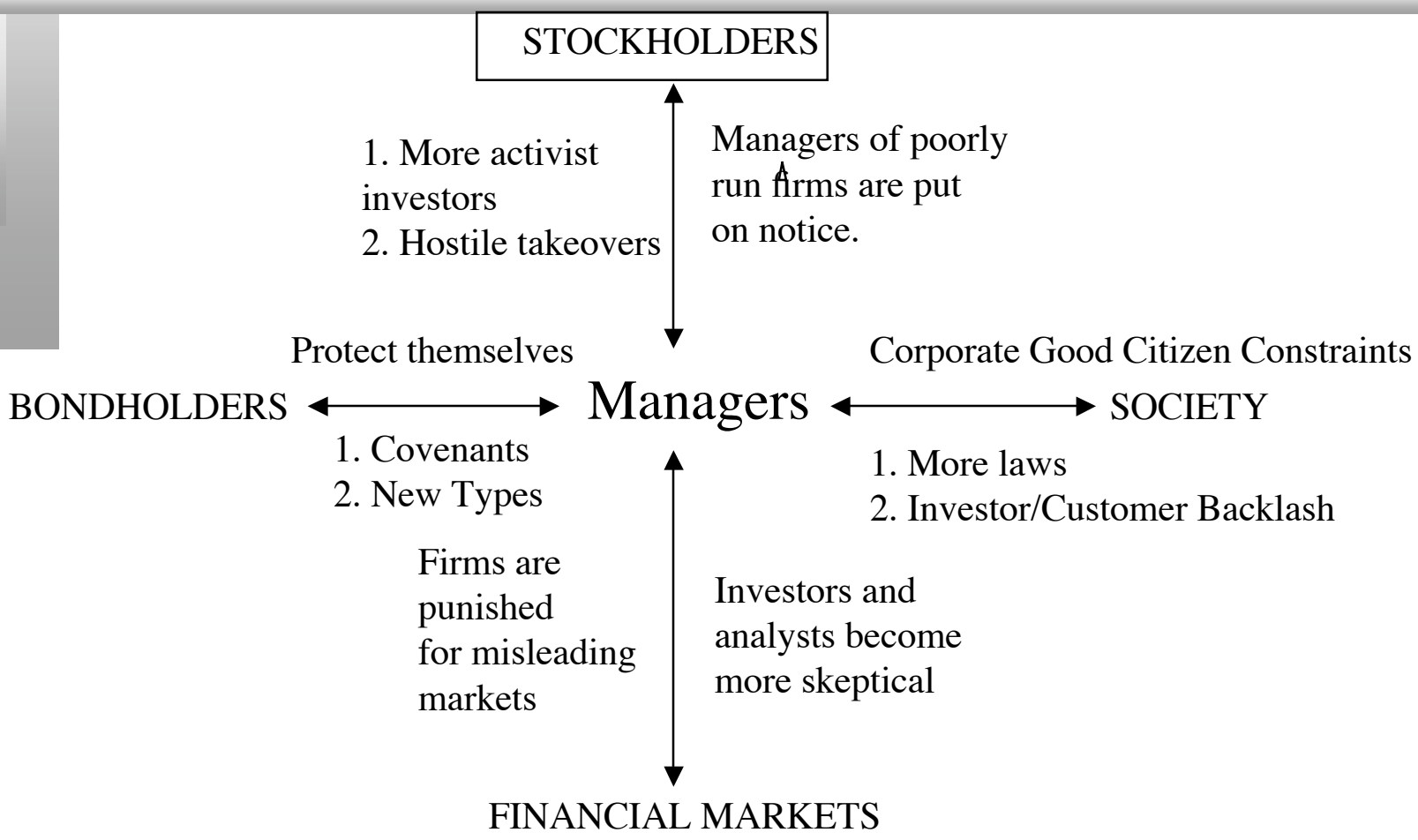
In response, boards are becoming more independent…

- Boards have become smaller over time. The median size of a board of directors has decreased from 16 to 20 in the 1970s to between 9 and 11 in 1998. The smaller boards are less unwieldy and more effective than the larger boards.
- There are fewer insiders on the board. In contrast to the 6 or more insiders that many boards had in the 1970s, only two directors in most boards in 1998 were insiders.
- Directors are increasingly compensated with stock and options in the company, instead of cash. In 1973, only 4% of directors received compensation in the form of stock or options, whereas 78% did so in 1998.
- More directors are identified and selected by a nominating committee rather than being chosen by the CEO of the firm. In 1998, 75% of boards had nominating committees; the comparable statistic in 1973 was 2%.

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.

The Counter Reaction



Picking the Right Projects: Investment Analysis

"Let us watch well our beginnings, and results will manage themselves"

Alexander Clark

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.
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The notion of a benchmark

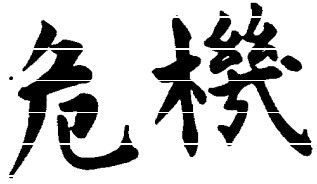
- Since financial resources are finite, there is a hurdle that projects have to cross before being deemed acceptable.
- This hurdle will be higher for riskier projects than for safer projects.
- A simple representation of the hurdle rate is as follows:

  Hurdle rate = Riskless Rate + Risk Premium

- The two basic questions that every risk and return model in finance tries to answer are:
  - How do you measure risk?
  - How do you translate this risk measure into a risk premium?

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

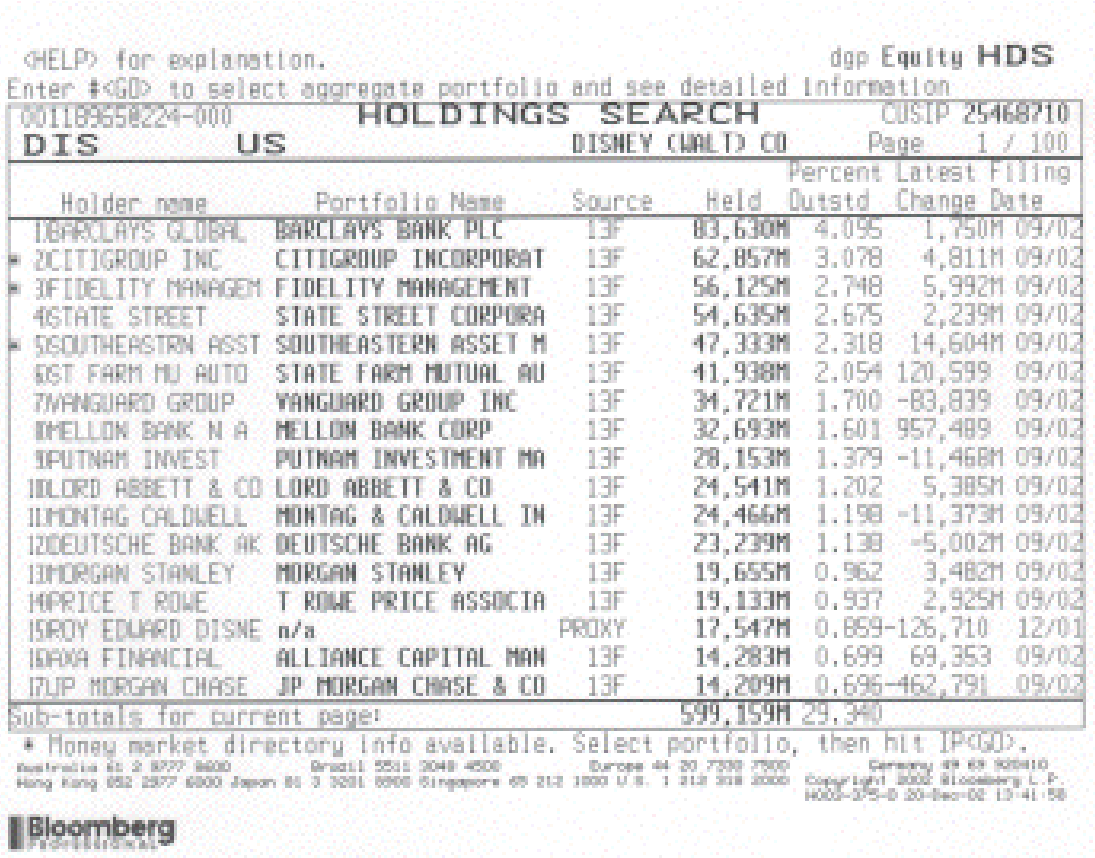
Risk that affects all investments (Market Risk)
Cannot be diversified away since most assets are affected by it.

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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Limitations of the CAPM

1. The model makes unrealistic assumptions
2. The parameters of the model cannot be estimated precisely
   - Definition of a market index
   - Firm may have changed during the 'estimation' period'
3. The model does not work well
   - If the model is right, there should be
     - a linear relationship between returns and betas
     - the only variable that should explain returns is betas
   - The reality is that
     - the relationship between betas and returns is weak
     - Other variables (size, price/book value) seem to explain differences in returns better.

Why the CAPM persists…

- The CAPM, notwithstanding its many critics and limitations, has survived as the default model for risk in equity valuation and corporate finance. The alternative models that have been presented as better models (APM, Multifactor model..) have made inroads in performance evaluation but not in prospective analysis because:
  - The alternative models (which are richer) do a much better job than the CAPM in explaining past return, but their effectiveness drops off when it comes to estimating expected future returns (because the models tend to shift and change).
  - The alternative models are more complicated and require more information than the CAPM.
  - For most companies, the expected returns you get with the the alternative models is not different enough to be worth the extra trouble of estimating four additional betas.

⌛Application Test: Who is the marginal investor in your firm?

You can get information on insider and institutional holdings in your firm from:

http://finance.yahoo.com/

Enter your company's symbol and choose profile.

- Looking at the breakdown of stockholders in your firm, consider whether the marginal investor is
  a) An institutional investor
  b) An individual investor
  c) An insider

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 and Time Horizon

- 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.

Riskfree Rate in Practice

- The riskfree rate is the rate on a zero coupon government bond matching the time horizon of the cash flow being analyzed.
- Theoretically, this translates into using different riskfree rates for each cash flow - the 1 year zero coupon rate for the cash flow in year 1, the 2-year zero coupon rate for the cash flow in year 2 ...
- Practically speaking, if there is substantial uncertainty about expected cash flows, the present value effect of using time varying riskfree rates is small enough that it may not be worth it.

The Bottom Line on Riskfree Rates

- Using a long term government rate (even on a coupon bond) as the riskfree rate on all of the cash flows in a long term analysis will yield a close approximation of the true value.
- For short term analysis, it is entirely appropriate to use a short term government security rate as the riskfree rate.
- The riskfree rate that you use in an analysis should be in the same currency that your cashflows are estimated in. In other words, if your cashflows are in U.S. dollars, your riskfree rate has to be in U.S. dollars as well.
  - Data Source: You can get riskfree rates for the US in a number of sites. Try http://www.bloomberg.com/markets.

Measurement of the risk premium

- The risk premium is the premium that investors demand for investing in an average risk investment, relative to the riskfree rate.
- As a general proposition, this premium should be
  - greater than zero
  - increase with the risk aversion of the investors in that market
  - increase with the riskiness of the "average" risk investment

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.

Risk Aversion and Risk Premiums

- If this were the capital market line, the risk premium would be a weighted average of the risk premiums demanded by each and every investor.
- The weights will be determined by the magnitude of wealth that each investor has. Thus, Warren Buffet's risk aversion counts more towards determining the "equilibrium" premium than yours' and mine.
- As investors become more risk averse, you would expect the "equilibrium" premium to increase.

Risk Premiums do change..

Go back to the previous example. Assume now that you are making the same choice but that you are making it in the aftermath of a stock market crash (it has dropped 25% in the last month). Would you change your answer?

a) I would demand a larger premium
b) I would demand a smaller premium
c) I would demand the same premium

Estimating Risk Premiums in Practice

- Survey investors on their desired risk premiums and use the average premium from these surveys.
- Assume that the actual premium delivered over long time periods is equal to the expected premium - i.e., use historical data
- Estimate the implied premium in today's asset prices.

The Survey Approach

- Surveying all investors in a market place is impractical.
- However, you can survey a few investors (especially the larger investors) and use these results. In practice, this translates into surveys of money managers' expectations of expected returns on stocks over the next year.
- The limitations of this approach are:
  - there are no constraints on reasonability (the survey could produce negative risk premiums or risk premiums of 50%)
  - they are extremely volatile
  - they tend to be short term; even the longest surveys do not go beyond one year

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.

What about historical premiums for other markets?

- Historical data for markets outside the United States is available for much shorter time periods. The problem is even greater in emerging markets.
- The historical premiums that emerge from this data reflects this and there is much greater error associated with the estimates of the premiums.

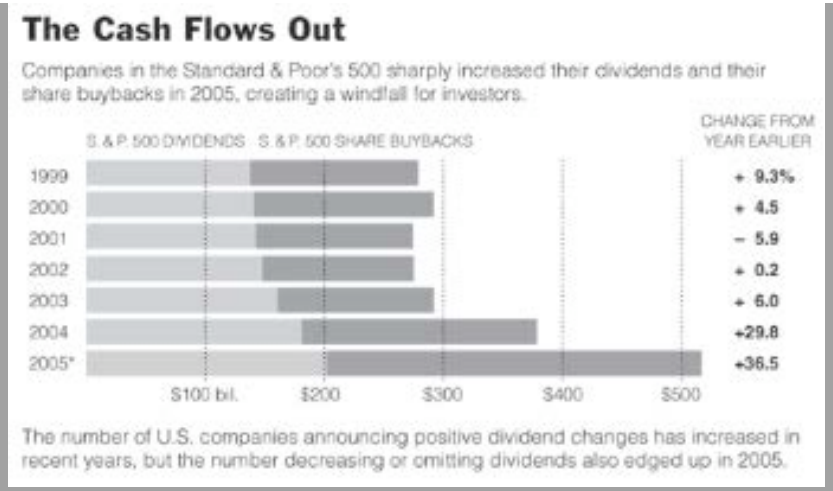
One solution: Look at a country's bond rating and default spreads as a start

- Ratings agencies such as S&P and Moody's assign ratings to countries that reflect their assessment of the default risk of these countries. These ratings reflect the political and economic stability of these countries and thus provide a useful measure of country risk. In January 2005, for instance, Brazil had a country rating of B1.
- If a country issues bonds denominated in a different currency (say dollars or euros), you can also see how the bond market views the risk in that country. In January 2005, Brazil had dollar denominated C-Bonds, trading at an interest rate of 7.73%. The US treasury bond rate that day was 4.22%, yielding a default spread of 3.51% for Brazil.
- Many analysts add this default spread to the US risk premium to come up with a risk premium for a country. Using this approach would yield a risk premium of 8.31% for Brazil, if we use 4.8% as the premium for the US.

Beyond the default spread

- Country ratings measure default risk. While default risk premiums and equity risk premiums are highly correlated, one would expect equity spreads to be higher than debt spreads. If we can compute how much more risky the equity market is, relative to the bond market, we could use this information. For example,
  - Standard Deviation in Bovespa (Equity) = 25.09%
  - Standard Deviation in Brazil C-Bond = 15.12%
  - Default spread on C-Bond = 3.51%
  - Country Risk Premium for Brazil = 3.51% (25.09%/15.12%) = 5.82%
- Note that this is on top of the premium you estimate for a mature market. Thus, if you assume that the risk premium in the US is 4.8%, the risk premium for Brazil would be 10.62%.

An alternate view of ERP: Watch what I pay, not what I say..



In 2005, dividends & stock buybacks were 3.34% of the index, generating 41.63.in cashflows

Analyst estimate of growth in net income for S&P 500 over next 5 years = 8%

After year 5, we will assume that earnings on the index will grow at 4.39%, the same rate as the entire economy

44.96 48.56 52.44 56.64 61.17

January 1, 2006
S&P 500 is at 1248.24

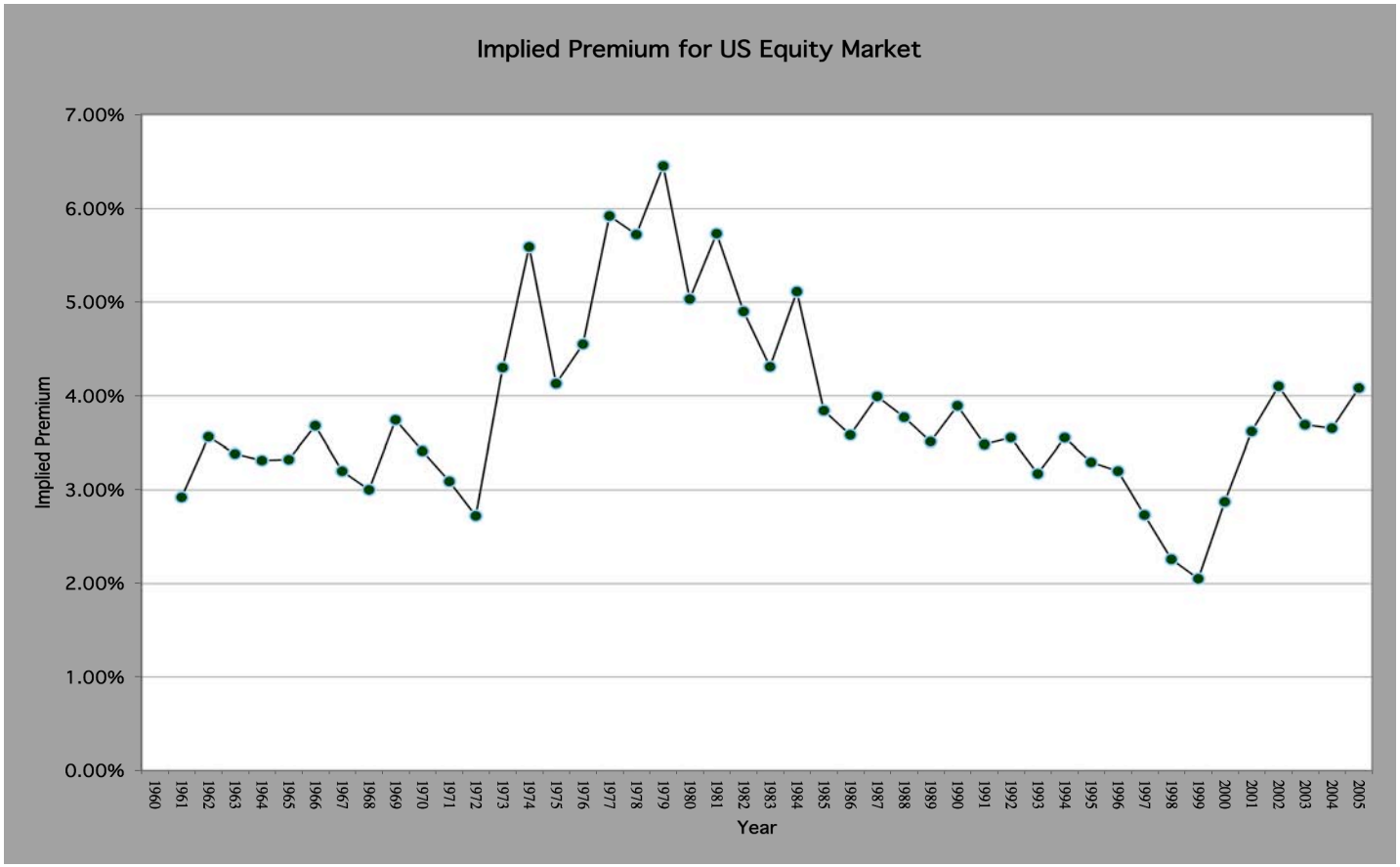
Solving for the implied premium…

- If we know what investors paid for equities at the beginning of 2006 and we can estimate the expected cash flows from equities, we can solve for the rate of return that they expect to make (IRR):

$$1248.29 = \frac{44.96}{(1+r)} + \frac{48.56}{(1+r)^2} + \frac{52.44}{(1+r)^3} + \frac{56.64}{(1+r)^4} + \frac{61.17}{(1+r)^5} + \frac{61.17(1.0439)}{(r-.0439)(1+r)^5}$$

- Expected Return on Stocks = 8.47%
- Implied Equity Risk Premium = Expected Return on Stocks - T.Bond Rate =8.47% - 4.39% = 4.08%

Implied Premiums in the US



Application Test: A Market Risk Premium

- Based upon our discussion of historical risk premiums so far, the risk premium looking forward should be:
  a) About 7.83%, which is what the arithmetic average premium has been since 1928, for stocks over T.Bills
  b) About 4.8%, which is the geometric average premium since 1928, for stocks over T.Bonds
  c) About 4%, which is the implied premium in the stock market today

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.

Estimating Performance

- The intercept of the regression provides a simple measure of performance during the period of the regression, relative to the capital asset pricing model.

$R_j = R_f + b (R_m - R_f)$

$= R_f (1-b) + b R_m$ ..... Capital Asset Pricing Model

$R_j = a + b R_m$ ..... Regression Equation

- If

$a > R_f (1-b)$ .... Stock did better than expected during regression period

$a = R_f (1-b)$ .... Stock did as well as expected during regression period

$a < R_f (1-b)$ .... Stock did worse than expected during regression period

- The difference between the intercept and $R_f (1-b)$ is Jensen's alpha. If it is positive, your stock did perform better than expected during the period of the regression.

Firm Specific and Market Risk

- The R squared (R^2) of the regression provides an estimate of the proportion of the risk (variance) of a firm that can be attributed to market risk;
- The balance ($1 - R^2$) can be attributed to firm specific risk.

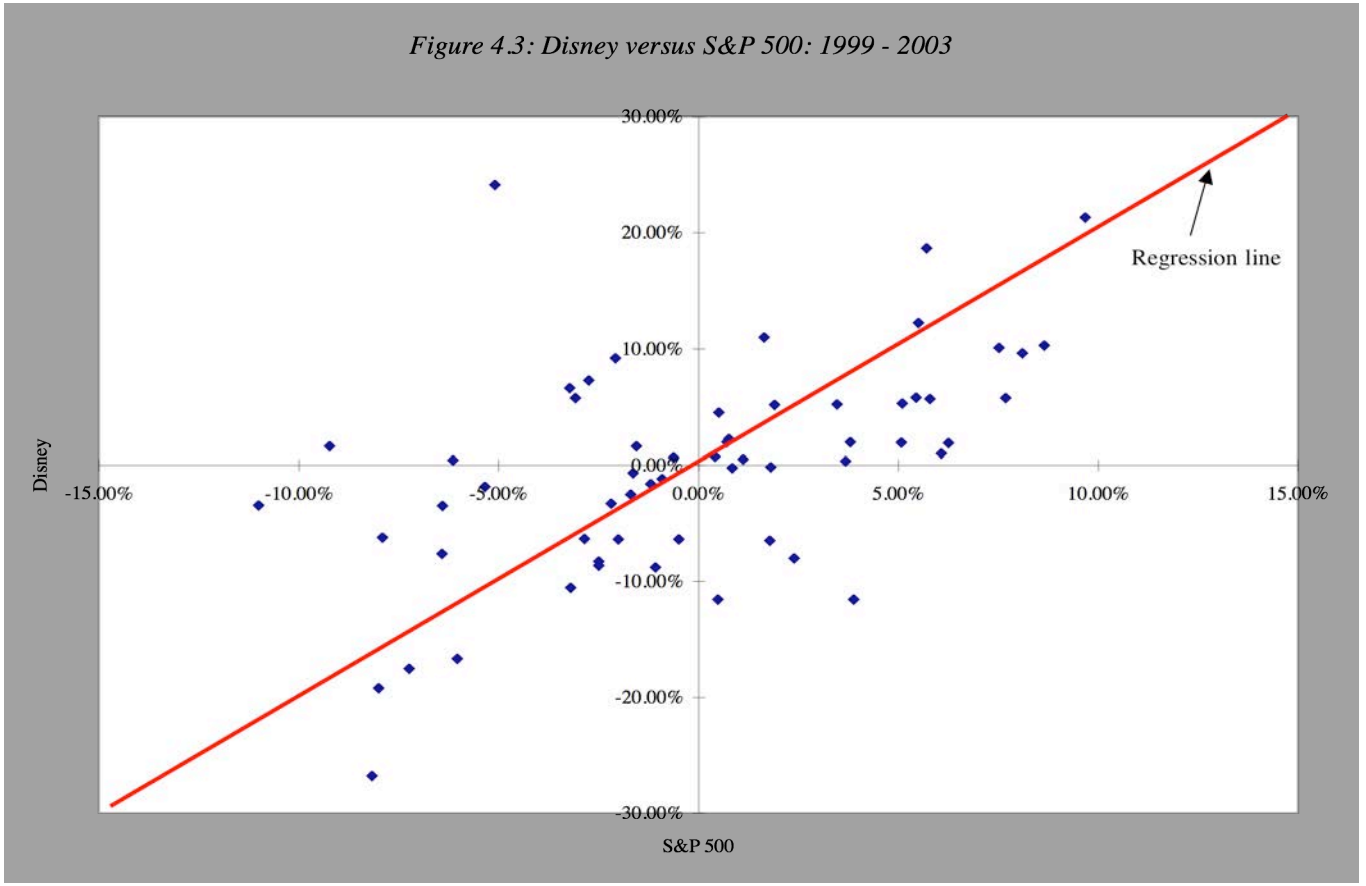
Setting up for the Estimation

- Decide on an estimation period
  - Services use periods ranging from 2 to 5 years for the regression
  - Longer estimation period provides more data, but firms change.
  - Shorter periods can be affected more easily by significant firm-specific event that occurred during the period (Example: ITT for 1995-1997)
- Decide on a return interval - daily, weekly, monthly
  - Shorter intervals yield more observations, but suffer from more noise.
  - Noise is created by stocks not trading and biases all betas towards one.
- Estimate returns (including dividends) on stock
  - Return = $(\text{Price}_{\text{End}} - \text{Price}_{\text{Beginning}} + \text{Dividends}_{\text{Period}})/ \text{Price}_{\text{Beginning}}$
  - Included dividends only in ex-dividend month
- Choose a market index, and estimate returns (inclusive of dividends) on the index for each interval for the period.

Choosing the Parameters: Disney

- Period used: 5 years
- Return Interval = Monthly
- Market Index: S&P 500 Index.
- For instance, to calculate returns on Disney in December 1999,
  - Price for Disney at end of November 1999 = $ 27.88
  - Price for Disney at end of December 1999 = $ 29.25
  - Dividends during month = $0.21 (It was an ex-dividend month)
  - Return =($29.25 - $27.88 + $ 0.21)/$27.88= 5.69%
- To estimate returns on the index in the same month
  - Index level (including dividends) at end of November 1999 = 1388.91
  - Index level (including dividends) at end of December 1999 = 1469.25
  - Return =(1469.25 - 1388.91)/ 1388.91 = 5.78%

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:

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

Analyzing Disney's Performance

- Intercept = 0.0467%
  - This is an intercept based on monthly returns. Thus, it has to be compared to a monthly riskfree rate.
  - Between 1999 and 2003,
    - Monthly Riskfree Rate = 0.313% (based upon average T.Bill rate: 99-03)
    - Riskfree Rate (1-Beta) = 0.313% (1-1.01) = -..0032%
- The Comparison is then between

Intercept	versus	Riskfree Rate (1 - Beta)
0.0467%	versus	0.313%(1-1.01)=-0.0032%

  - Jensen's Alpha = 0.0467% -(-0.0032%) = 0.05%
- Disney did 0.05% better than expected, per month, between 1999 and 2003.
  - Annualized, Disney's annual excess return = $(1.0005)^{12}$-1= 0.60%

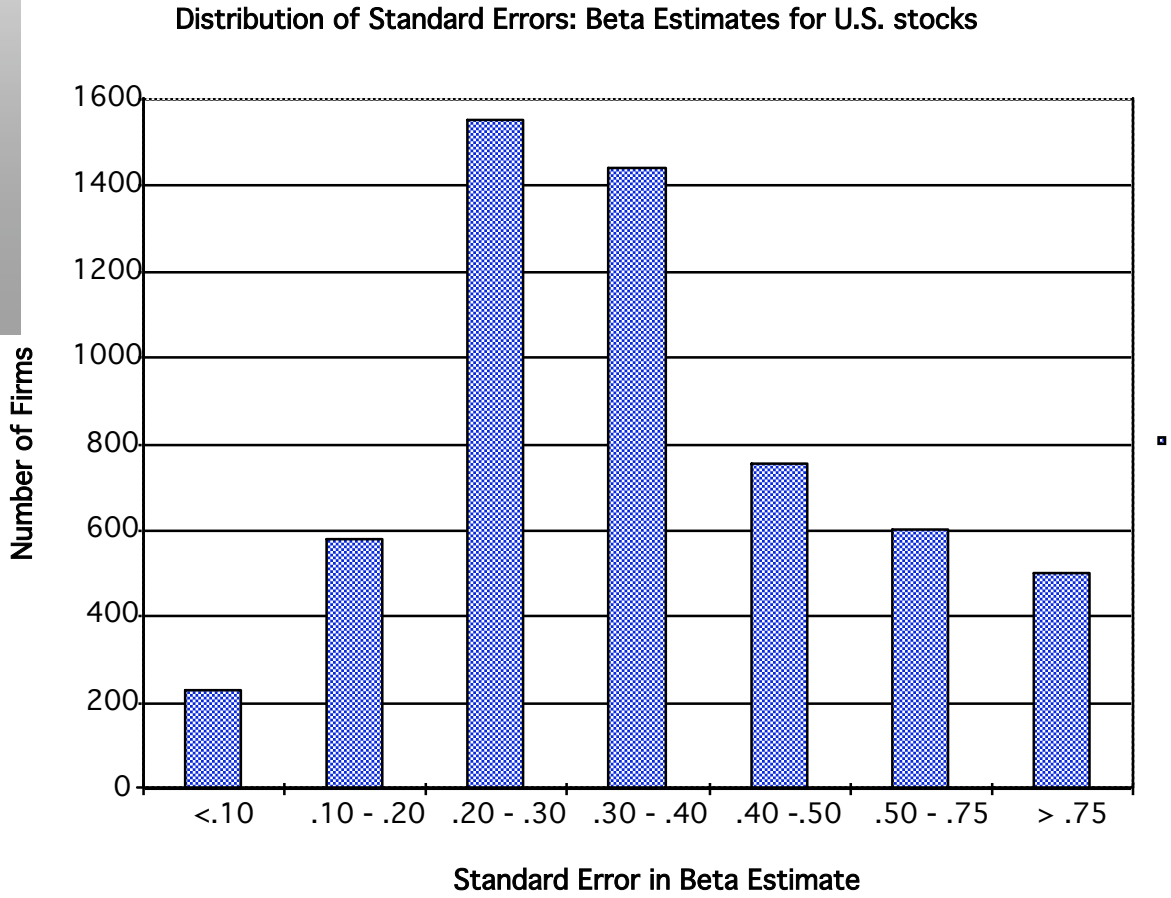
A positive Jensen's alpha… Who is responsible?

- Disney has a positive Jensen's alpha of 0.60% a year between 1999 and 2003. This can be viewed as a sign that management in the firm did a good job, managing the firm during the period.
  a) True
  b) False

Estimating Disney's Beta

- 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.
- Assume that I asked you what Disney's true beta is, after this regression.
  - What is your best point estimate?
  - What range would you give me, with 67% confidence?
  - What range would you give me, with 95% confidence?

The Dirty Secret of "Standard Error"



Breaking down Disney's Risk

- R Squared = 29%
- This implies that
  - 29% of the risk at Disney comes from market sources
  - 71%, therefore, comes from firm-specific sources
- The firm-specific risk is diversifiable and will not be rewarded

The Relevance of R Squared

You are a diversified investor trying to decide whether you should invest in Disney or Amgen. They both have betas of 1.01, but Disney has an R Squared of 29% while Amgen's R squared of only 14.5%. Which one would you invest in?

a) Amgen, because it has the lower R squared
b) Disney, because it has the higher R squared
c) You would be indifferent

Would your answer be different if you were an undiversified investor?

Beta Estimation: Using a Service (Bloomberg)

<HELP> for explanation. N166 Equity BETA

HISTORICAL BETA

Number of points may be insufficient for an accurate beta.

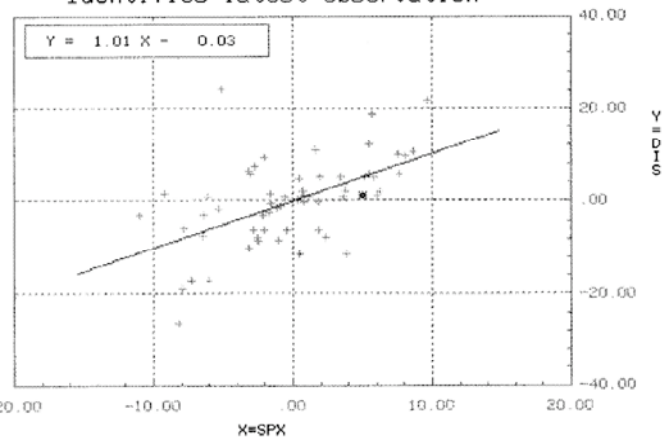
DIS US Equity — THE WALT DISNEY CO.

Relative Index SPX — S&P 500 INDEX

*Identifies latest observation

Period M Monthly
Range 1/29/99 To 12/31/03
Market T Trade

ADJ BETA	1.01
RAW BETA	1.01
Alpha(Intercept)	-0.03
R2 (Correlation)	0.29
Std Dev of Error	7.95
Std Error of Beta	0.21
Number of Points	59



ADJ BETA = (0.67) * RAW BETA
+ (0.33) * 1.0

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2004 Bloomberg L.P.
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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%

Use to a Potential Investor in Disney

As a potential investor in Disney, what does this expected return of 8.87% tell you?

a) This is the return that I can expect to make in the long term on Disney, if the stock is correctly priced and the CAPM is the right model for risk,

b) This is the return that I need to make on Disney in the long term to break even on my investment in the stock

c) Both

Assume now that you are an active investor and that your research suggests that an investment in Disney will yield 12.5% a year for the next 5 years. Based upon the expected return of 8.87%, you would

a) Buy the stock

b) Sell the stock

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?

Application Test: Analyzing the Risk Regression

- Using your Bloomberg risk and return print out, answer the following questions:
  - How well or badly did your stock do, relative to the market, during the period of the regression? (You can assume an annualized riskfree rate of 4.8% during the regression period)

    Intercept - (4.8%/n) (1- Beta) = Jensen's Alpha

    Where n is the number of return periods in a year (12 if monthly; 52 if weekly)
  - What proportion of the risk in your stock is attributable to the market? What proportion is firm-specific?
  - What is the historical estimate of beta for your stock? What is the range on this estimate with 67% probability? With 95% probability?
  - Based upon this beta, what is your estimate of the required return on this stock?

    Riskless Rate + Beta * Risk Premium

A Quick Test

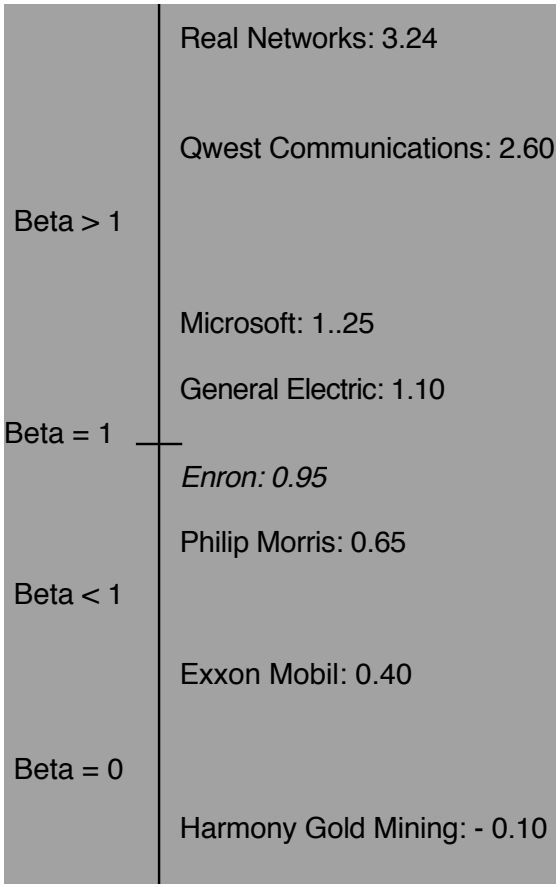
You are advising a very risky software firm on the right cost of equity to use in project analysis. You estimate a beta of 3.0 for the firm and come up with a cost of equity of 18.46%. The CFO of the firm is concerned about the high cost of equity and wants to know whether there is anything he can do to lower his beta.

How do you bring your beta down?

Should you focus your attention on bringing your beta down?

a) Yes
b) No

Beta: Exploring Fundamentals



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.

Measures of Operating Leverage

Fixed Costs Measure = Fixed Costs / Variable Costs

- This measures the relationship between fixed and variable costs. The higher the proportion, the higher the operating leverage.

EBIT Variability Measure = % Change in EBIT / % Change in Revenues

- This measures how quickly the earnings before interest and taxes changes as revenue changes. The higher this number, the greater the operating leverage.

Disney's Operating Leverage: 1987- 2003

Year	Net Sales	% Change in Sales	EBIT	% Change in EBIT
1987	2877		756	
1988	3438	19.50%	848	12.17%
1989	4594	33.62%	1177	38.80%
1990	5844	27.21%	1368	16.23%
1991	6182	5.78%	1124	-17.84%
1992	7504	21.38%	1287	14.50%
1993	8529	13.66%	1560	21.21%
1994	10055	17.89%	1804	15.64%
1995	12112	20.46%	2262	25.39%
1996	18739	54.71%	3024	33.69%
1997	22473	19.93%	3945	30.46%
1998	22976	2.24%	3843	-2.59%
1999	23435	2.00%	3580	-6.84%
2000	25418	8.46%	2525	-29.47%
2001	25172	-0.97%	2832	12.16%
2002	25329	0.62%	2384	-15.82%
2003	27061	6.84%	2713	13.80%
1987-2003		15.83%		10.09%
1996-2003		11.73%		4.42%

Reading Disney's Operating Leverage

- Operating Leverage = % Change in EBIT/ % Change in Sales
  = 10.09% / 15.83% = 0.64
- This is lower than the operating leverage for other entertainment firms, which we computed to be 1.12. This would suggest that Disney has lower fixed costs than its competitors.
- The acquisition of Capital Cities by Disney in 1996 may be skewing the operating leverage. Looking at the changes since then:

  Operating Leverage$_{1996\text{-}03}$ = 4.42%/11.73% = 0.38

  Looks like Disney's operating leverage has decreased since 1996.

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

Equity Betas and Leverage

- 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

Effects of leverage on betas: Disney

- The regression beta for Disney is 1.01. This beta is a levered beta (because it is based on stock prices, which reflect leverage) and the leverage implicit in the beta estimate is the average market debt equity ratio during the period of the regression (1999 to 2003)
- The average debt equity ratio during this period was 27.5%.
- The unlevered beta for Disney can then be estimated (using a marginal tax rate of 37.3%)

  = Current Beta / (1 + (1 - tax rate) (Average Debt/Equity))

  = 1.01 / (1 + (1 - 0.373)) (0.275)) = 0.8615

Disney : Beta and Leverage

Debt to Capital	Debt/Equity Ratio	Beta	Effect of Leverage
0.00%	0.00%	0.86	0.00
10.00%	11.11%	0.92	0.06
20.00%	25.00%	1.00	0.14
30.00%	42.86%	1.09	0.23
40.00%	66.67%	1.22	0.36
50.00%	100.00%	1.40	0.54
60.00%	150.00%	1.67	0.81
70.00%	233.33%	2.12	1.26
80.00%	400.00%	3.02	2.16
90.00%	900.00%	5.72	4.86

Betas are weighted Averages

- The beta of a portfolio is always the market-value weighted average of the betas of the individual investments in that portfolio.
- Thus,
  - the beta of a mutual fund is the weighted average of the betas of the stocks and other investment in that portfolio
  - the beta of a firm after a merger is the market-value weighted average of the betas of the companies involved in the merger.

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 firm*	*Average levered beta*	*Median D/E*	*Unlevered beta*	*Cash/Firm Value*	*Unlevered beta corrected for cash*
Media Networks	Radio 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%

Discussion Issue

- If you were the chief financial officer of Disney, what cost of equity would you use in capital budgeting in the different divisions?
  a) The cost of equity for Disney as a company
  b) The cost of equity for each of Disney's divisions?

Estimating Betas for Non-Traded Assets

- The conventional approaches of estimating betas from regressions do not work for assets that are not traded.
- There are two ways in which betas can be estimated for non-traded assets
  - using comparable firms
  - using accounting earnings

Using comparable firms to estimate beta for Bookscape

Assume that you are trying to estimate the beta for a independent bookstore in New York City.

Firm	Beta	Debt	Equity	Cash
Books-A-Million	0.532	$45	$45	$5
Borders Group	0.844	$182	$1,430	$269
Barnes & Noble	0.885	$300	$1,606	$268
Courier Corp	0.815	$1	$285	$6
Info Holdings	0.883	$2	$371	$54
John Wiley &Son	0.636	$235	$1,662	$33
Scholastic Corp	0.744	$549	$1,063	$11
Sector	*0.7627*	*$1,314*	*$6,462*	*$645*

Unlevered Beta = 0.7627/(1+(1-.35)(1314/6462)) = 0.6737

Corrected for Cash = 0.6737 / (1 – 645/(1314+6462)) = 0.7346

Estimating Bookscape Levered Beta and Cost of Equity

- Since the debt/equity ratios used are market debt equity ratios, and the only debt equity ratio we can compute for Bookscape is a book value debt equity ratio, we have assumed that Bookscape is *close to the industry average* debt to equity ratio of 20.33%.
- Using a marginal tax rate of 40% (based upon personal income tax rates) for Bookscape, we get a levered beta of 0.82.

  Levered beta for Bookscape = 0.7346 (1 +(1-.40) (.2033)) = 0.82
- Using a riskfree rate of 4% (US treasury bond rate) and a historical risk premium of 4.82%:

  Cost of Equity = 4% + 0.82 (4.82%) = 7.95%

Is Beta an Adequate Measure of Risk for a Private Firm?

- The owners of most private firms are not diversified. Beta measures the risk added on to a diversified portfolio. Therefore, using beta to arrive at a cost of equity for a private firm will
  a) Under estimate the cost of equity for the private firm
  b) Over estimate the cost of equity for the private firm
  c) Could under or over estimate the cost of equity for the private firm

Total Risk versus Market Risk

- Adjust the beta to reflect total risk rather than market risk. This adjustment is a relatively simple one, since the R squared of the regression measures the proportion of the risk that is market risk.

  Total Beta = Market Beta / Correlation of the sector with the market

- In the Bookscape example, where the market beta is 0.82 and the average R-squared of the comparable publicly traded firms is 16%,

$$\frac{\text{Market Beta}}{\sqrt{\text{R squared}}} = \frac{0.82}{\sqrt{.16}} = 2.06$$

  - Total Cost of Equity = 4% + 2.06 (4.82%) = 13.93%

Application Test: Estimating a Bottom-up Beta

- Based upon the business or businesses that your firm is in right now, and its current financial leverage, estimate the bottom-up unlevered beta for your firm.

- *Data Source*: You can get a listing of unlevered betas by industry on my web site by going to updated data.

From Cost of Equity to Cost of Capital

- The cost of capital is a composite cost to the firm of raising financing to fund its projects.
- In addition to equity, firms can raise capital from debt

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, Bookscape had operating income of $ 2 million after interest expenses of 500,000. The resulting interest coverage ratio is 4.00.
  - Interest coverage ratio = 2,000,000/500,000 = 4.00

Interest Coverage Ratios, Ratings and Default Spreads: Small Companies

Interest Coverage Ratio	Rating	Typical default spread
> 12.5	AAA	0.35%
9.50 - 12.50	AA	0.50%
7.50 – 9.50	A+	0.70%
6.00 – 7.50	A	0.85%
4.50 – 6.00	A-	1.00%
4.00 – 4.50	BBB	1.50%
3.50 - 4.00	BB+	2.00%
3.00 – 3.50	BB	2.50%
2.50 – 3.00	B+	3.25%
2.00 - 2.50	B	4.00%
1.50 – 2.00	B-	6.00%
1.25 – 1.50	CCC	8.00%
0.80 – 1.25	CC	10.00%
0.50 – 0.80	C	12.00%
< 0.65	D	20.00%

Synthetic Rating and Cost of Debt for Bookscape

- Rating based on interest coverage ratio = BBB
- Default Spread based upon rating = 1.50%
- Pre-tax cost of debt = Riskfree Rate + Default Spread = 4% + 1.50% = 5.50%
- After-tax cost of debt = Pre-tax cost of debt (1- tax rate) = 5.50% (1-.40) = 3.30%

Estimating Cost of Debt with rated companies

- For the three publicly traded firms in our sample, we will use the actual bond ratings to estimate the costs of debt:

	S&P Rating	*Riskfree Rate*	*Default Spread*	*Cost of Debt*	*Tax Rate*	*After-tax Cost of Debt*
Disney	BBB+	4% ($)	1.25%	5.25%	37.3%	3.29%
Deutsche Bank	AA-	4.05% (Eu)	1.00%	5.05%	38%	3.13%
Aracruz	B+	4% ($)	3.25%	7.25%	34%	4.79%

- We computed the synthetic ratings for Disney and Aracruz using the interest coverage ratios:
  - Disney: Coverage ratio = 2,805/758 =3.70 Synthetic rating = A-
  - Aracruz: Coverage ratio = 888/339= 2.62 Synthetic rating = BBB
  - Disney's synthetic rating is close to its actual rating. Aracruz has two ratings – one for its local currency borrowings of BBB- and one for its dollar borrowings of B+.

Application Test: Estimating a Cost of Debt

- Based upon your firm's current earnings before interest and taxes, its interest expenses, estimate
  - An interest coverage ratio for your firm
  - A synthetic rating for your firm (use the interest coverage table)
  - A pre-tax cost of debt for your firm
  - An after-tax cost of debt for your firm

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.

Estimating Market Value Weights

- Market Value of Equity should include the following
  - Market Value of Shares outstanding
  - Market Value of Warrants outstanding
  - Market Value of Conversion Option in Convertible Bonds
- Market Value of Debt is more difficult to estimate because few firms have only publicly traded debt. There are two solutions:
  - Assume book value of debt is equal to market value
  - Estimate the market value of debt from the book value
  - For Disney, with book value of 13,100 million, interest expenses of $666 million, a current cost of borrowing of 5.25% and an weighted average maturity of 11.53 years.

Estimated MV of Disney Deb $666\left[\frac{(1-\frac{1}{(1.0525)^{11.53}}}{.0525}\right]+\frac{13,100}{(1.0525)^{11.53}}=\$12,915 \text{ million}$

Converting Operating Leases to Debt

- The “debt value” of operating leases is the present value of the lease payments, at a rate that reflects their risk.
- In general, this rate will be close to or equal to the rate at which the company can borrow.

Operating Leases at Disney

- The pre-tax cost of debt at Disney is 5.25%

Year	Commitment	Present Value
1	$ 271.00	$ 257.48
2	$ 242.00	$ 218.46
3	$ 221.00	$ 189.55
4	$ 208.00	$ 169.50
5	$ 275.00	$ 212.92
6 –9	$ 258.25	$ 704.93
Debt Value of leases =		$ 1,752.85

- Debt outstanding at Disney = $12,915 + $ 1,753= $14,668 million

Application Test: Estimating Market Value

- Estimate the
  - Market value of equity at your firm and Book Value of equity
  - Market value of debt and book value of debt (If you cannot find the average maturity of your debt, use 3 years): Remember to capitalize the value of operating leases and add them on to both the book value and the market value of debt.
- Estimate the
  - Weights for equity and debt based upon market value
  - Weights for equity and debt based upon book value

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)

Disney's Divisional Costs of Capital

Business	Cost of Equity	After-tax cost of debt	E/(D+E)	D/(D+E)	Cost of capital
Media Networks	10.10%	3.29%	78.98%	21.02%	8.67%
Parks and Resorts	9.12%	3.29%	78.98%	21.02%	7.90%
Studio Entertainment	10.43%	3.29%	78.98%	21.02%	8.93%
Consumer Products	10.39%	3.29%	78.98%	21.02%	8.89%
Disney	**10.00%**	**3.29%**	**78.98%**	**21.02%**	**8.59%**

Application Test: Estimating Cost of Capital

- Using the bottom-up unlevered beta that you computed for your firm, and the values of debt and equity you have estimated for your firm, estimate a bottom-up levered beta and cost of equity for your firm.

- Based upon the costs of equity and debt that you have estimated, and the weights for each, estimate the cost of capital for your firm.

- How different would your cost of capital have been, if you used book value weights?

Choosing a Hurdle Rate

- Either the cost of equity or the cost of capital can be used as a hurdle rate, depending upon whether the returns measured are to equity investors or to all claimholders on the firm (capital)
- If returns are measured to equity investors, the appropriate hurdle rate is the cost of equity.
- If returns are measured to capital (or the firm), the appropriate hurdle rate is the cost of capital.

Back to 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.

Measuring Investment Returns

"Show me the money"

Jerry Maguire

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.**
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- 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"

Earnings versus Cash Flows: 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.

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%

Should there be a risk premium for foreign projects?

- The exchange rate risk should be diversifiable risk (and hence should not command a premium) if
  - the company has projects is a large number of countries (or)
  - the investors in the company are globally diversified.

  For Disney, this risk should not affect the cost of capital used. Consequently, we would not adjust the cost of capital for Disney's investments in other mature markets (Germany, UK, France)
- The same diversification argument can also be applied against political risk, which would mean that it too should not affect the discount rate. It may, however, affect the cash flows, by reducing the expected life or cash flows on the project.

  For Disney, this is the risk that we are incorporating into the cost of capital when it invests in Thailand (or any other emerging market)

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 country risk premium for Thailand:
  - The rating for Thailand is Baa1 and the default spread for the country bond is 1.50%. Multiplying this by the relative volatility of 2.2 of the equity market in Thailand (strandard deviation of equity/standard devaiation of country bond) yields a country risk premium of 3.3%.
    - 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%

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

From Project to Firm Return on Capital: Disney in 2003

- Just as a comparison of project return on capital to the cost of capital yields a measure of whether the project is acceptable, a comparison can be made at the firm level, to judge whether the existing projects of the firm are adding or destroying value.
- Disney, in 2003, had earnings before interest and taxes of $2,713 million, had a book value of equity of $23,879 million and a book value of debt of 14,130 million. With a tax rate of 37.3%, we get

  Return on Capital = 2713(1-.373)/ (23879+14130) = 4.48%

  Cost of Capital for Disney= 8.59%

  Excess Return = 4.48%-8.59% = -4.11%
- This can be converted into a dollar figure by multiplying by the capital invested, in which case it is called economic value added

  EVA = (..0448- .0859) (23879+14130) = - $1,562 million

Application Test: Assessing Investment Quality

- For the most recent period for which you have data, compute the after-tax return on capital earned by your firm, where after-tax return on capital is computed to be

After-tax ROC = EBIT (1-tax rate)/ (BV of debt + BV of Equity)$_{\text{previous year}}$

- For the most recent period for which you have data, compute the return spread earned by your firm:

Return Spread = After-tax ROC - Cost of Capital

- For the most recent period, compute the EVA earned by your firm

EVA = Return Spread * ((BV of debt + BV of Equity)$_{\text{previous year}}$

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)

To Time-Weighted Cash Flows

- Incremental cash flows in the earlier years are worth more than incremental cash flows in later years.
- In fact, cash flows across time cannot be added up. They have to be brought to the same point in time before aggregation.
- This process of moving cash flows through time is
  - discounting, when future cash flows are brought to the present
  - compounding, when present cash flows are taken to the future
- The discounting and compounding is done at a discount rate that will reflect
  - Expected inflation: Higher Inflation -> Higher Discount Rates
  - Expected real rate: Higher real rate -> Higher Discount rate
  - Expected uncertainty: Higher uncertainty -> Higher Discount Rate

Present Value Mechanics

Cash Flow Type	Discounting Formula	Compounding Formula
1. Simple CF	$CF_n / (1+r)^n$	$CF_0 (1+r)^n$
2. Annuity	$A\left[\frac{1 - \frac{1}{(1+r)^n}}{r}\right]$	$A\left[\frac{(1+r)^n - 1}{r}\right]$
3. Growing Annuity	$A(1+g)\left[\frac{1 - \frac{(1+g)^n}{(1+r)^n}}{r-g}\right]$	
4. Perpetuity	A/r	
5. Growing Perpetuity	Expected Cashflow next year/(r-g)	

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

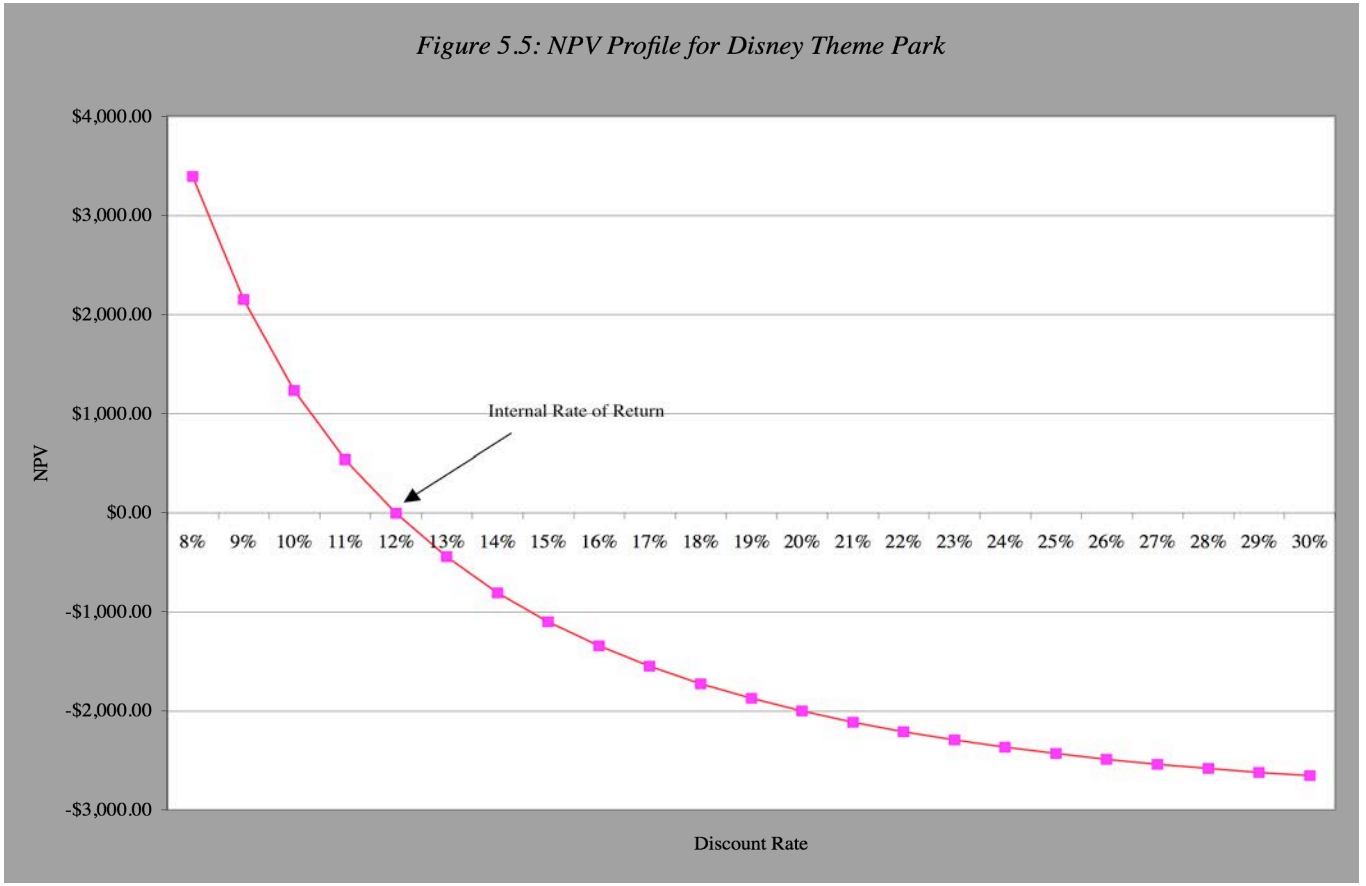
Which yields a NPV of..

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.

The IRR of this project



The IRR suggests..

- **The project is a good one**. Using time-weighted, incremental cash flows, this project provides a return of 11.97%. This is greater than the cost of capital of 10.66%.
- The IRR and the NPV will yield **similar results** most of the time, though there are differences between the two approaches that may cause project rankings to vary depending upon the approach used.

Currency Choices and NPV

- The analysis was done in dollars. Would the conclusions have been any different if we had done the analysis in Thai Baht?
  a) Yes
  b) No

Disney Theme Park: Thai Baht NPV

Inflation rate in Thailand = 10%
Inflation rate in US = 2%

Bt/$ in year 1 = 42.09 (1.10/1.02) = 45.39

Year	Cashflow ($)	Bt/$	Cashflow (Bt)	Present Value
0	-2000	42.09	-84180	-84180
1	-1000	45.39	-45391	-38034
2	-880	48.95	-43075	-30243
3	-289	52.79	-15262	-8979
4	324	56.93	18420	9080
5	443	61.40	27172	11223
6	486	66.21	32187	11140
7	517	71.40	36920	10707
8	571	77.01	43979	10687
9	631	83.04	52412	10671
10	8474	89.56	758886	129470
				31542

NPV = 31,542 Bt/42.09 Bt = $ 749 Million

NPV is equal to NPV in dollar terms

The Role of Sensitivity Analysis

- Our conclusions on a project are clearly conditioned on a large number of assumptions about revenues, costs and other variables over very long time periods.
- To the degree that these assumptions are wrong, our conclusions can also be wrong.
- One way to gain confidence in the conclusions is to check to see how sensitive the decision measure (NPV, IRR..) is to changes in key assumptions.

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.

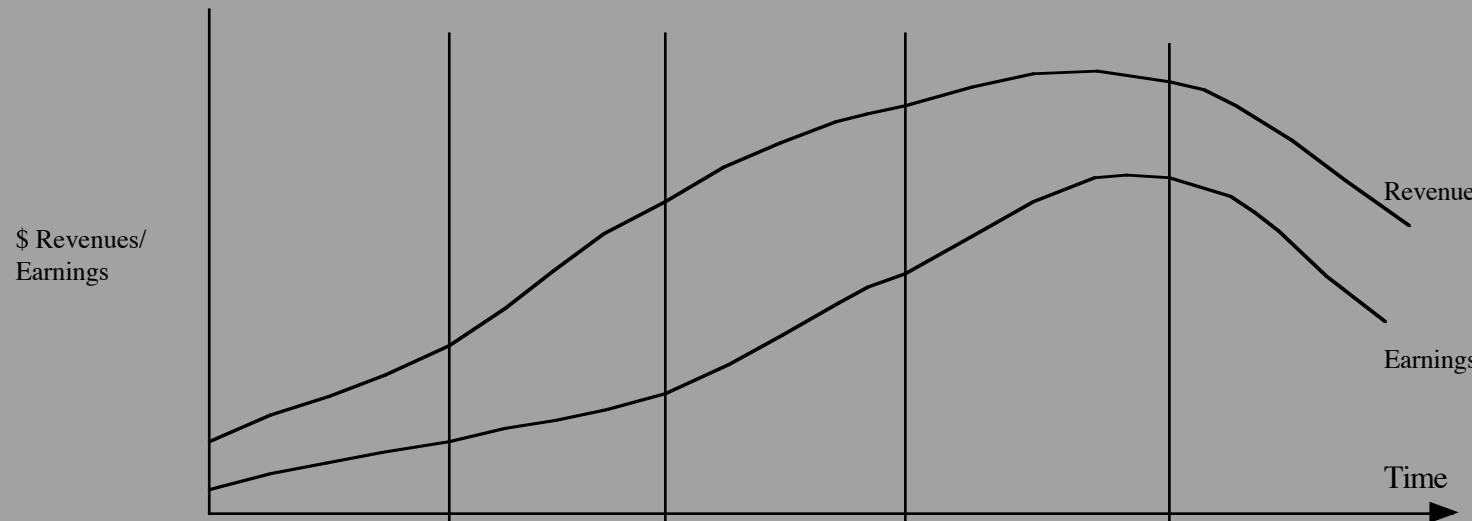
Finding the Right Financing Mix: The Capital Structure Decision

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

Financing Choices across the life cycle



External funding needs	High, but constrained by infrastructure	High, relative to firm value.	Moderate, relative to firm value.	Declining, as a percent of firm value	Low, as projects dry up.
Internal financing	Negative or low	Negative or low	Low, relative to funding needs	High, relative to funding needs	More than funding needs
External Financing	Owner's Equity Bank Debt	Venture Capital Common Stock	Common stock Warrants Convertibles	Debt	Retire debt Repurchase stock
Growth stage	Stage 1 Start-up	Stage 2 Rapid Expansion	Stage 3 High Growth	Stage 4 Mature Growth	Stage 5 Decline
Financing Transitions	Accessing private equity	Inital Public offering	Seasoned equity issue	Bond issues	

Measuring a firm's financing mix

- The simplest measure of how much debt and equity a firm is using currently is to look at the proportion of debt in the total financing. This ratio is called the debt to capital ratio:

  Debt to Capital Ratio = Debt / (Debt + Equity)
- Debt includes all interest bearing liabilities, short term as well as long term.
- Equity can be defined either in accounting terms (as book value of equity) or in market value terms (based upon the current price). The resulting debt ratios can be very different.

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.

Implications of MM Theorem

- Leverage is irrelevant. A firm's value will be determined by its project cash flows.
- The cost of capital of the firm will not change with leverage. As a firm increases its leverage, the cost of equity will increase just enough to offset any gains to the leverage

Pathways to the Optimal

- The Cost of Capital Approach: The optimal debt ratio is the one that minimizes the cost of capital for a firm.
- The Sector Approach: The optimal debt ratio is the one that brings the firm closes to its peer group in terms of financing mix.

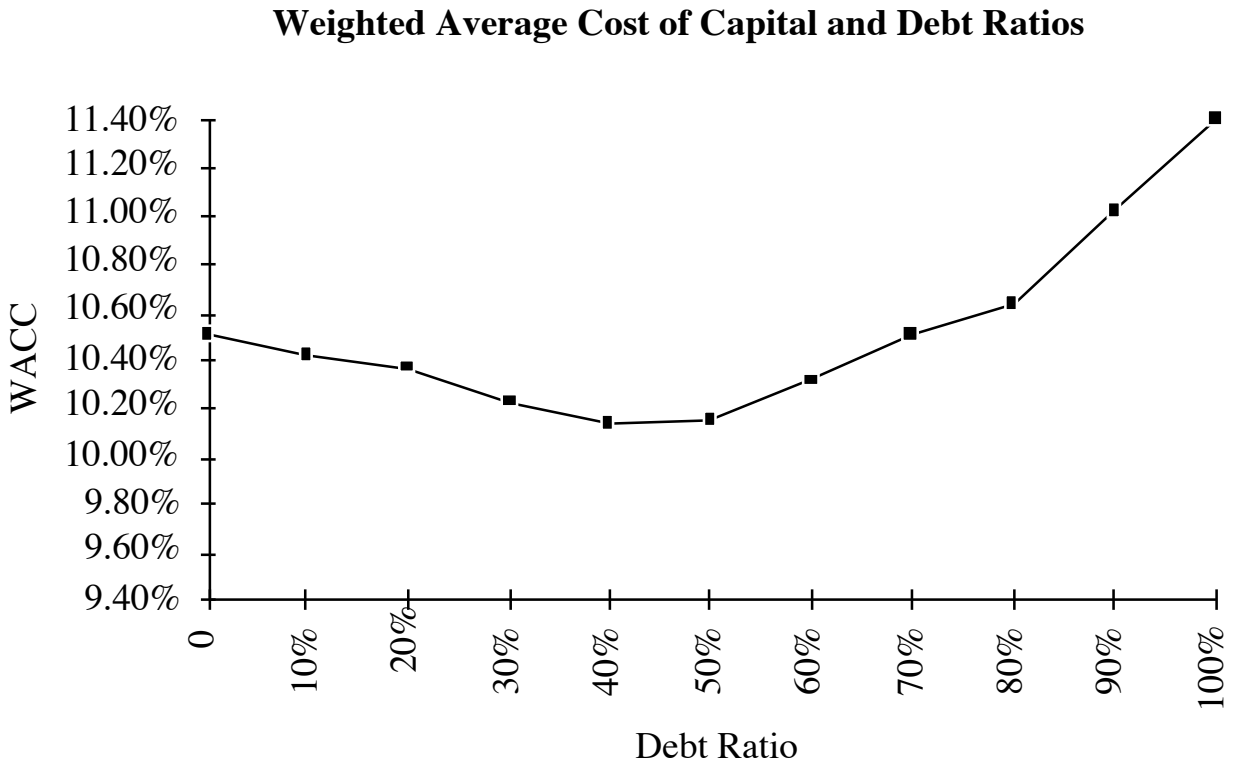
I. The Cost of Capital Approach

- 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.

Applying Cost of Capital Approach: The Textbook Example

D/(D+E)	ke	kd	After-tax Cost of Debt	WACC
0	10.50%	8%	4.80%	10.50%
10%	11%	8.50%	5.10%	10.41%
20%	11.60%	9.00%	5.40%	10.36%
30%	12.30%	9.00%	5.40%	10.23%
40%	13.10%	9.50%	5.70%	10.14%
50%	14%	10.50%	6.30%	10.15%
60%	15%	12%	7.20%	10.32%
70%	16.10%	13.50%	8.10%	10.50%
80%	17.20%	15%	9.00%	10.64%
90%	18.40%	17%	10.20%	11.02%
100%	19.70%	19%	11.40%	11.40%

WACC and Debt Ratios



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%

Estimating Cost of Debt

Start with the current market value of the firm = 55,101 + 14668 = $69, 769 mil

D/(D+E)	0.00%	10.00%	Debt to capital
D/E	0.00%	11.11%	D/E = 10/90 = .1111
$ Debt	$0	$6,977	10% of $69,769
EBITDA	$3,882	$3,882	Same as 0% debt
Depreciation	$1,077	$1,077	Same as 0% debt
EBIT	$2,805	$2,805	Same as 0% debt
Interest	$0	$303	Pre-tax cost of debt * $ Debt
Pre-tax Int. cov	∞	9.24	EBIT/ Interest Expenses
Likely Rating	AAA	AAA	From Ratings table
Pre-tax cost of debt	4.35%	4.35%	Riskless Rate + Spread

The Ratings Table

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%

A Test: Can you do the 20% level?

D/(D+E)	*0.00%*	*10.00%*	*20.00%*	*2nd Iteration 3rd?*
D/E	0.00%	11.11%	25.00%	
$ Debt	$0	$6,977	$13,954	
EBITDA	$3,882	$3,882	$3,882	
Depreciation	$1,077	$1,077	$1,077	
EBIT	$2,805	$2,805	$2,805	
Interest	$0	$303	$ 606	.0485*13954=676
Pre-tax Int. cov	∞	9.24	4.62	2805/676=4.15
Likely Rating	AAA	AAA	A	A-
Cost of debt	4.35%	4.35%	4.85%	5.00%

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%

Stated versus Effective Tax Rates

- You need taxable income for interest to provide a tax savings
- In the Disney case, consider the interest expense at 30% and 40%

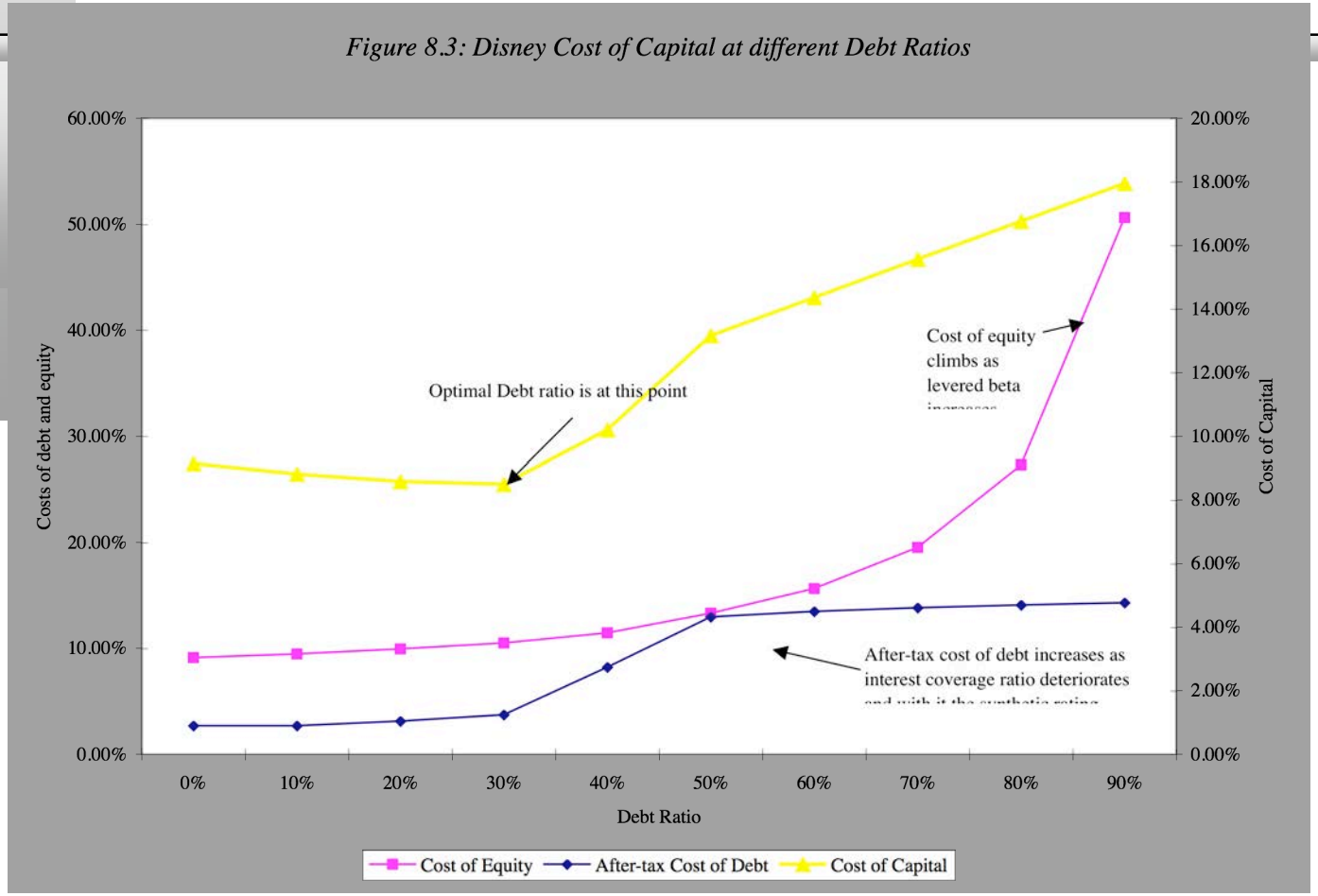
	30% Debt Ratio	*40% Debt Ratio*
EBIT	$ 2,805 m	$ 2,805 m
Interest Expense	$ 1,256 m	$ 3,349 m
Tax Savings	$ 1,256*.373=468	2,805*.373 = $ 1,046
Tax Rate	37.30%	1,046/3,349= 31.2%
Pre-tax interest rate	6.00%	12.00%
After-tax Interest Rate	3.76%	8.25%

- You can deduct only $2,805 million of the $3,349 million of the interest expense at 40%. Therefore, only 37.3% of $ 2,805 million is considered as the tax savings.

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



Effect on Firm Value

- Firm Value before the change = 55,101+14,668= $ 69,769

  $WACC_b$ = 8.59% Annual Cost = $69,769 *8.59%= $5,993 million

  $WACC_a$ = 8.50% Annual Cost = $69,769 *8.50% = $5,930 million

  Δ WACC = 0.09% Change in Annual Cost = $ 63 million

- If there is no growth in the firm value, (Conservative Estimate)
  - Increase in firm value = $63 / .0850= $ 741 million
  - Change in Stock Price = $741/2047.6= $0.36 per share
- If we assume a perpetual growth of 4% in firm value over time,
  - Increase in firm value = $63 /(.0850-.04) = $ 1,400 million
  - Change in Stock Price = $1,400/2,047.6 = $ 0.68 per share

Implied Growth Rate obtained by

Firm value Today =FCFF(1+g)/(WACC-g): Perpetual growth formula

$69,769 = $1,722(1+g)/(.0859-g): Solve for g -> Implied growth = 5.98%

A Test: The Repurchase Price

- Let us suppose that the CFO of Disney approached you about buying back stock. He wants to know the maximum price that he should be willing to pay on the stock buyback. (The current price is $ 26.91) Assuming that firm value will grow by 4% a year, estimate the maximum price.

- What would happen to the stock price after the buyback if you were able to buy stock back at $ 26.91?

The Downside Risk

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

Disney's Operating Income: History

Year	EBIT	% Chang e in EBIT
1987	756	
1988	848	12.17%
1989	1177	38.80%
1990	1368	16.23%
1991	1124	-17.84%
1992	1287	14.50%
1993	1560	21.21%
1994	1804	15.64%
1995	2262	25.39%
1996	3024	33.69%
1997	3945	30.46%
1998	3843	-2.59%
1999	3580	-6.84%
2000	2525	-29.47%
2001	2832	12.16%
2002	2384	-15.82%
2003	2713	13.80%

Disney: Effects of Past Downturns

Recession	*Decline in Operating Income*
2002	Drop of 15.82%
1991	Drop of 22.00%
1981-82	Increased
Worst Year	Drop of 29.47%

- The standard deviation in past operating income is about 20%.

Disney: The Downside Scenario

% Drop in EBITDA	*EBIT*	*Optimal Debt Ratio*
0%	$ 2,805	30%
5%	$ 2,665	20%
10%	$ 2,524	20%
15%	$ 2385	20%
20%	$ 2,245	20%

Constraints on Ratings

- Management often specifies a 'desired Rating' below which they do not want to fall.
- The rating constraint is driven by three factors
  - it is one way of protecting against downside risk in operating income (so do not do both)
  - a drop in ratings might affect operating income
  - there is an ego factor associated with high ratings
- Caveat: Every Rating Constraint Has A Cost.
  - Provide Management With A Clear Estimate Of How Much The Rating Constraint Costs By Calculating The Value Of The Firm Without The Rating Constraint And Comparing To The Value Of The Firm With The Rating Constraint.

Ratings Constraints for Disney

- At its optimal debt ratio of 30%, Disney has an estimated rating of BB+.
- Assume that Disney imposes a rating constraint of A or greater.
- The optimal debt ratio for Disney is then 20% (see next page)
- The cost of imposing this rating constraint can then be calculated as follows:

Value at 30% Debt	= $ 71,239 million
- Value at 20% Debt	= $ 69,837 million
Cost of Rating Constraint	= $ 1,376 million

Effect of Ratings Constraints: Disney

Debt Ratio	Rating	Firm Value
0%	AAA	$62,279
10%	AAA	$66,397
20%	A-	$69,837
30%	BB+	$71,239
40%	CCC	$51,661
50%	C	$34,969
60%	C	$30,920
70%	C	$27,711
80%	C	$25,105
90%	C	$22,948

What if you do not buy back stock..

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

Analyzing Financial Service Firms

- The interest coverage ratios/ratings relationship is likely to be different for financial service firms.
- The definition of debt is messy for financial service firms. In general, using all debt for a financial service firm will lead to high debt ratios. Use only interest-bearing long term debt in calculating debt ratios.
- The effect of ratings drops will be much more negative for financial service firms.
- There are likely to regulatory constraints on capital

Interest Coverage ratios, ratings and Operating income

Long Term Interest Coverage Ratio	*Rating is*	*Spread is*	*Operating Income Decline*
< 0.05	D	16.00%	-50.00%
0.05 – 0.10	C	14.00%	-40.00%
0.10 – 0.20	CC	12.50%	-40.00%
0.20 - 0.30	CCC	10.50%	-40.00%
0.30 – 0.40	B-	6.25%	-25.00%
0.40 – 0.50	B	6.00%	-20.00%
0.50 – 0.60	B+	5.75%	-20.00%
0.60 – 0.75	BB	4.75%	-20.00%
0.75 – 0.90	BB+	4.25%	-20.00%
0.90 – 1.20	BBB	2.00%	-20.00%
1.20 – 1.50	A-	1.50%	-17.50%
1.50 – 2.00	A	1.40%	-15.00%
2.00 – 2.50	A+	1.25%	-10.00%
2.50 – 3.00	AA	0.90%	-5.00%
> 3.00	AAA	0.70%	0.00%

Deutsche Bank: Optimal Capital Structure

Debt Ratio	*Beta*	*Cost of Equity*	*Bond Rating*	*Interest rate on deb*	*Tax Rate*	*Cost of Debt (after-tax)*	*WACC*	*Firm Value (G)*
0%	0.44	6.15%	AAA	4.75%	38.00%	2.95%	6.15%	$111,034
10%	0.47	6.29%	AAA	4.75%	38.00%	2.95%	5.96%	$115,498
20%	0.50	6.48%	AAA	4.75%	38.00%	2.95%	5.77%	$120,336
30%	0.55	6.71%	AAA	4.75%	38.00%	2.95%	5.58%	$125,597
40%	0.62	7.02%	AAA	4.75%	38.00%	2.95%	5.39%	$131,339
50%	0.71	7.45%	A+	5.30%	38.00%	3.29%	5.37%	$118,770
60%	0.84	8.10%	A	5.45%	38.00%	3.38%	5.27%	$114,958
70%	1.07	9.19%	A	5.45%	38.00%	3.38%	5.12%	$119,293
80%	1.61	11.83%	BB+	8.30%	32.43%	5.61%	6.85%	$77,750
90%	3.29	19.91%	BB	8.80%	27.19%	6.41%	7.76%	$66,966

Determinants of Optimal Debt Ratios

- Firm Specific Factors
  - 1. Tax Rate
  - Higher tax rates - - > Higher Optimal Debt Ratio
  - Lower tax rates - - > Lower Optimal Debt Ratio
  - 2. Pre-Tax CF on Firm = EBITDA / MV of Firm
  - Higher Pre-tax CF - - > Higher Optimal Debt Ratio
  - Lower Pre-tax CF - - > Lower Optimal Debt Ratio
  - 3. Variance in Earnings [Shows up when you do 'what if' analysis]
  - Higher Variance - - > Lower Optimal Debt Ratio
  - Lower Variance - - > Higher Optimal Debt Ratio
- Macro-Economic Factors
  - 1. Default Spreads

    Higher - - > Lower Optimal Debt Ratio

    Lower - - > Higher Optimal Debt Ratio

Application Test: Your firm's optimal financing mix

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

II. Relative Analysis

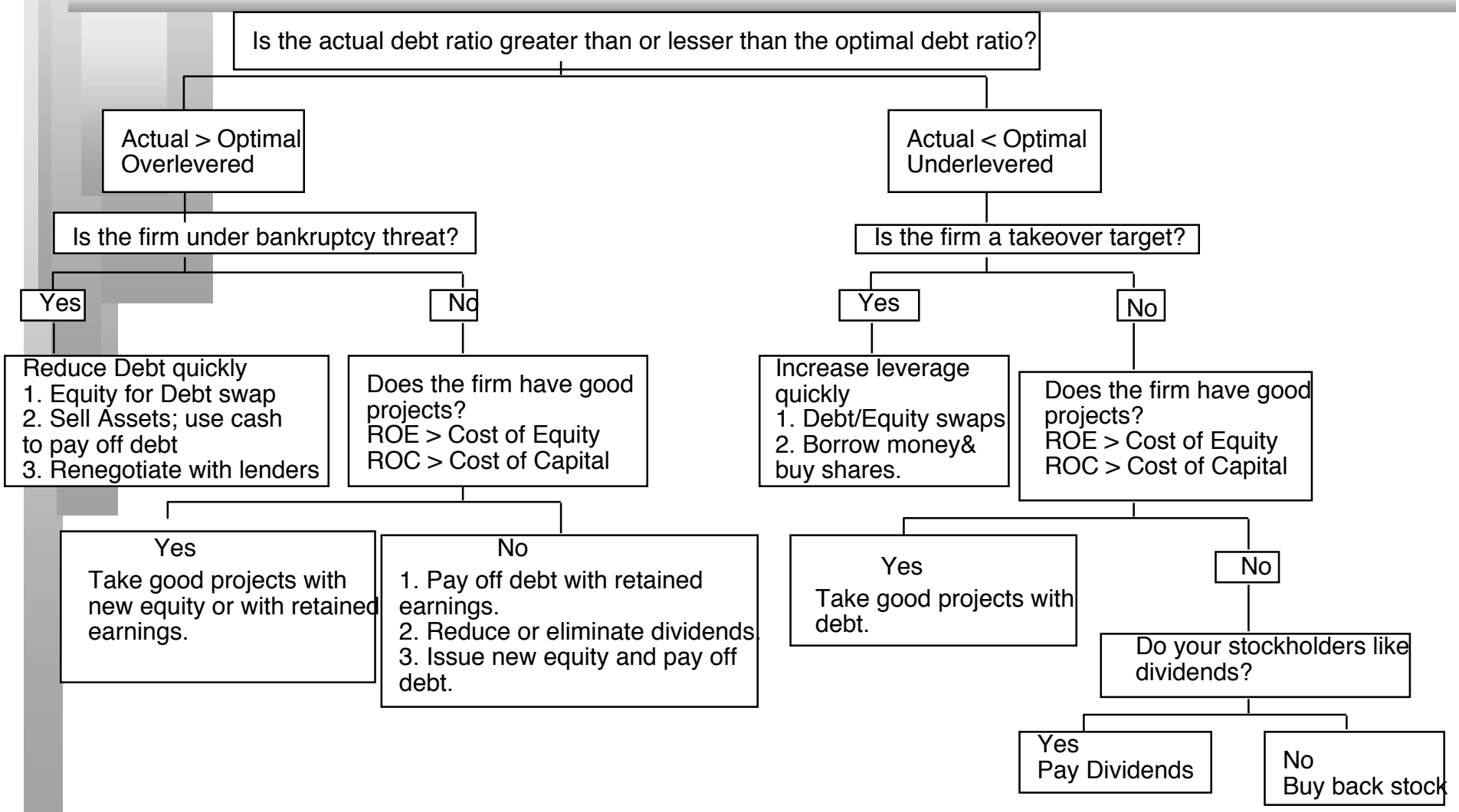
I. Industry Average with Subjective Adjustments

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

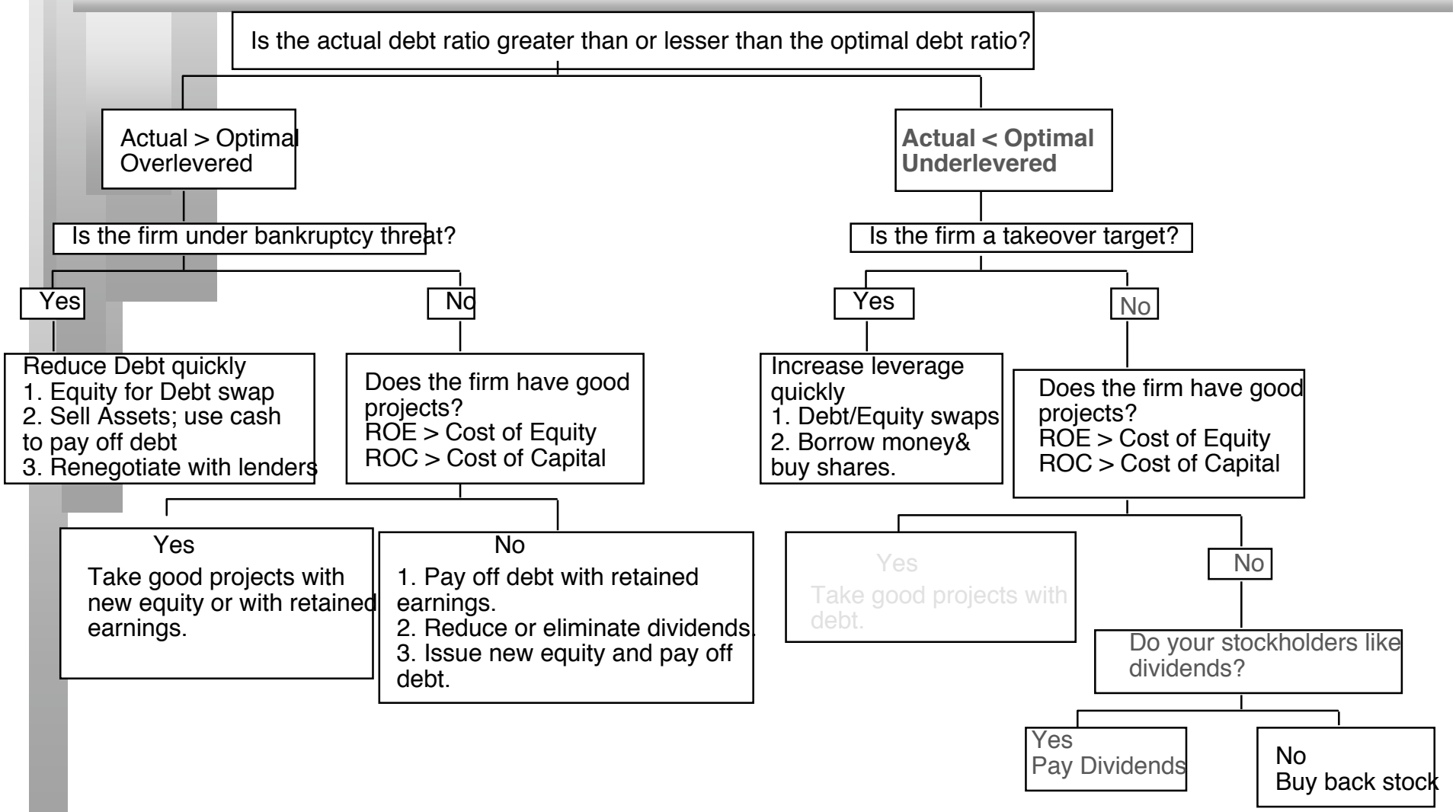
Comparing to industry averages

	Disney	*Entertainment*	*Aracruz*	*Paper and Pulp (Emerging Market)*
Market Debt Ratio	21.02%	19.56%	30.82%	27.71%
Book Debt Ratio	35.10%	28.86%	43.12%	49.00%

A Framework for Getting to the Optimal



Disney: Applying the Framework



Application Test: Getting to the Optimal

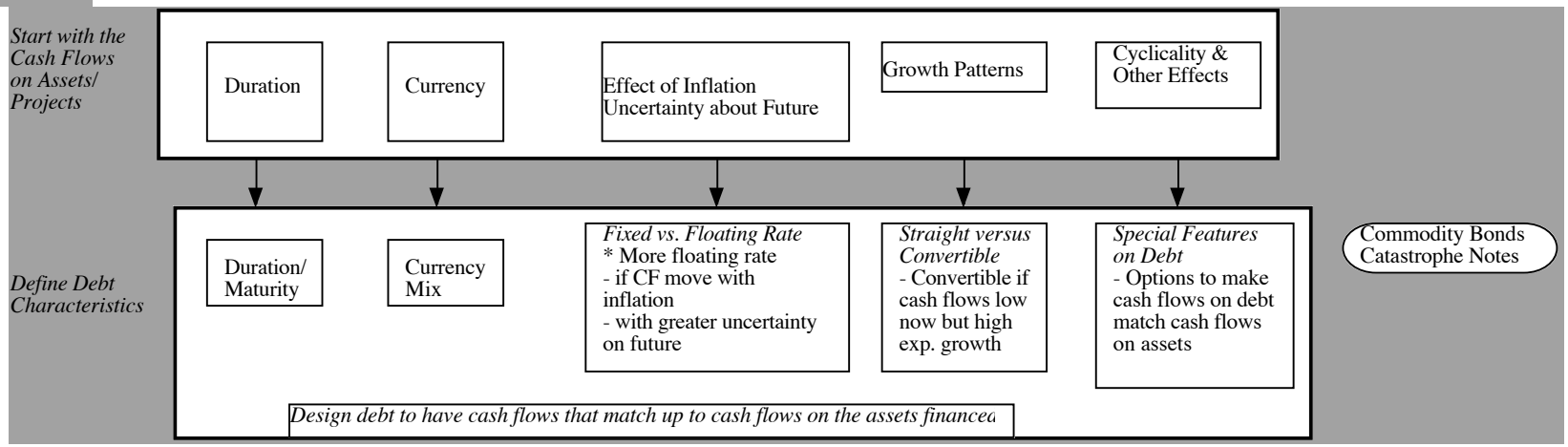
- Based upon your analysis of both the firm's capital structure and investment record, what path would you map out for the firm?
  - Immediate change in leverage
  - Gradual change in leverage
  - No change in leverage
- Would you recommend that the firm change its financing mix by
  - Paying off debt/Buying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

Designing Debt: The Fundamental Principle

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

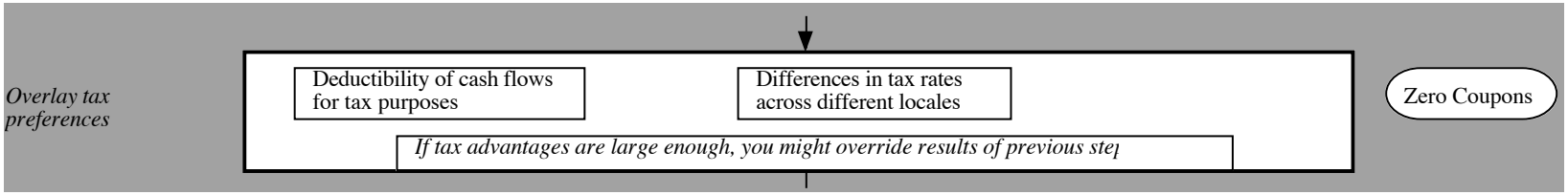
Design the perfect financing instrument

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



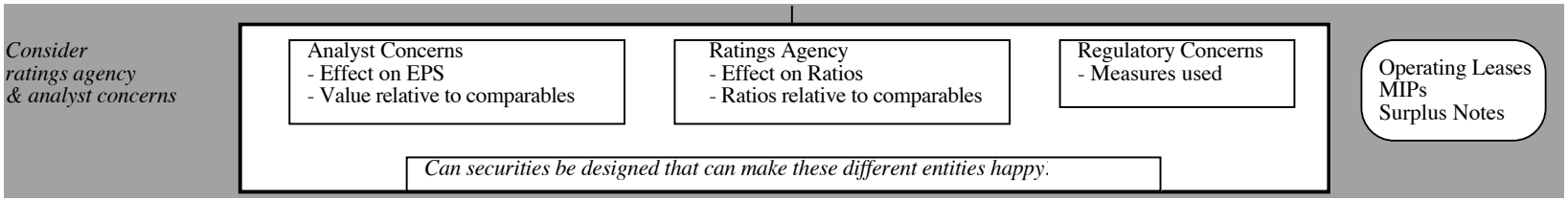
Ensuring that you have not crossed the line drawn by the tax code

- 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.



Debt or Equity: The Strange Case of Trust Preferred

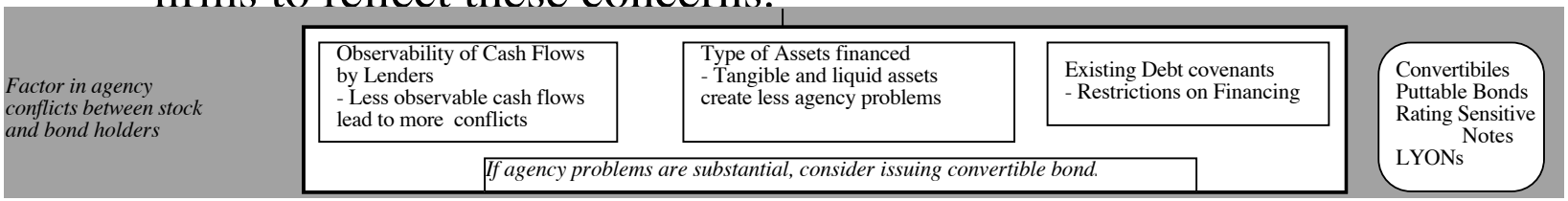
- Trust preferred stock has
  - A fixed dividend payment, specified at the time of the issue
  - That is tax deductible
  - And failing to make the payment can cause ? (Can it cause default?)
- When trust preferred was first created, ratings agencies treated it as equity. As they have become more savvy, 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

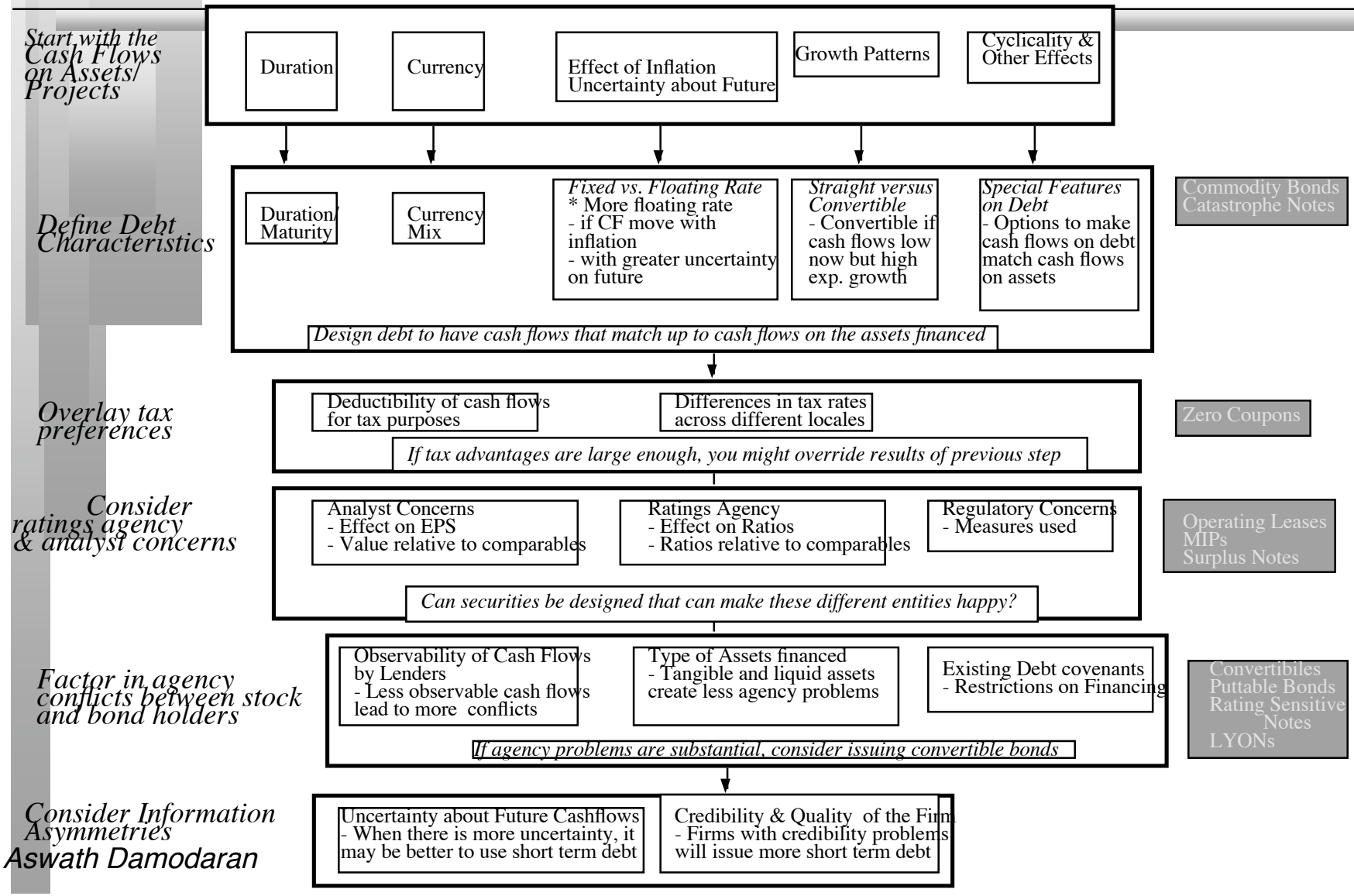
- There are some firms that face skepticism from bondholders when they go out to raise debt, because
  - Of their past history of defaults or other actions
  - They are small firms without any borrowing history
- Bondholders tend to demand much higher interest rates from these firms to reflect these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



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



The Right Debt for Disney

Business	*Project Cash Flow Characteristics*	*Type of Financing*
Movies	Projects are likely to 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 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 1. Short term 2. Primarily in dollars, though foreign component is growing 3. Driven by advertising revenues and show success	Debt should be 1. Short term 2. Primarily dollar debt 3. If possible, linked to network ratings.
Theme Parks	Projects are likely to be 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 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 a. Medium term b. Dollar debt.

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.

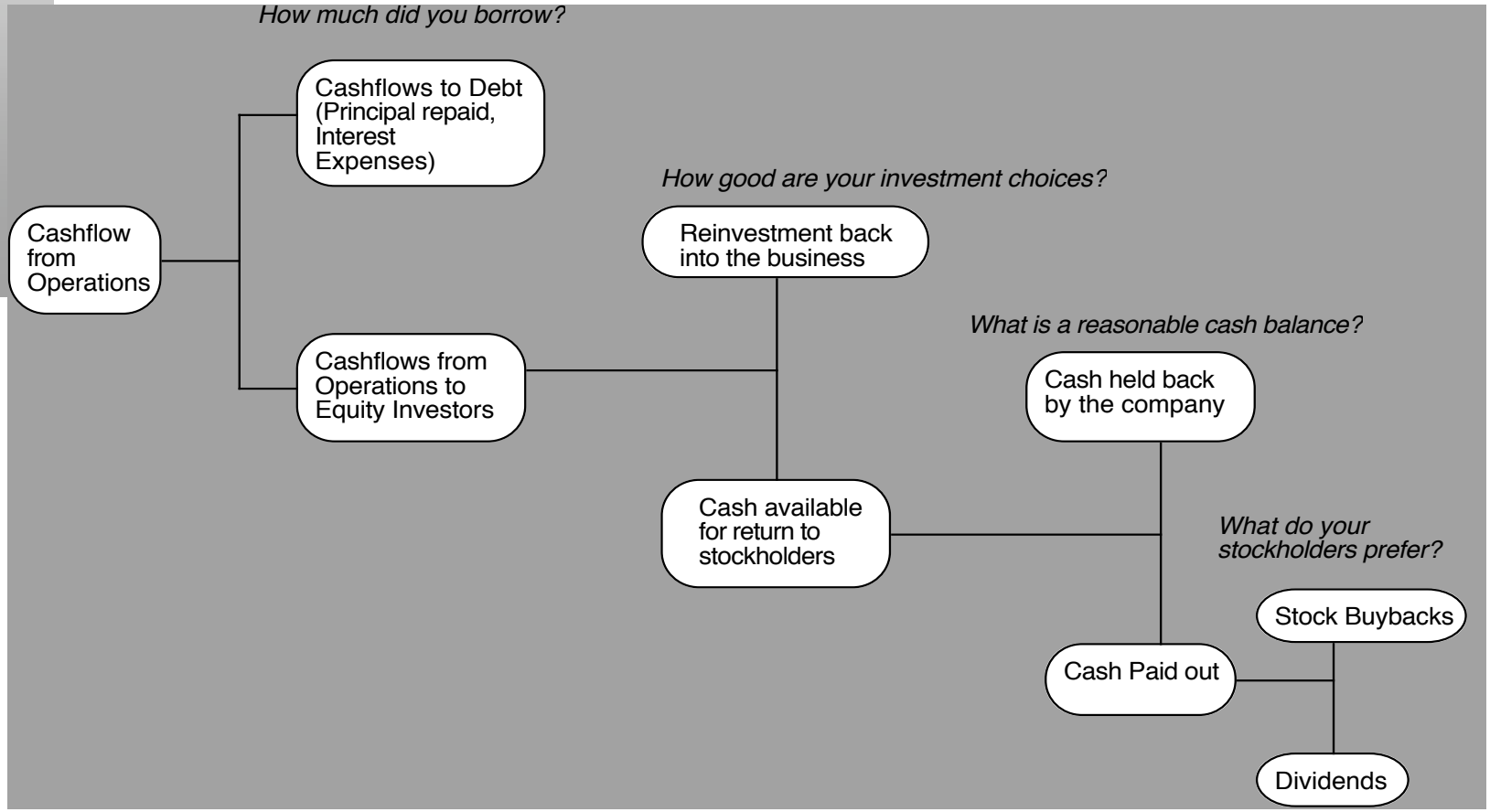
Returning Cash to the Owners: Dividend Policy

First Principles

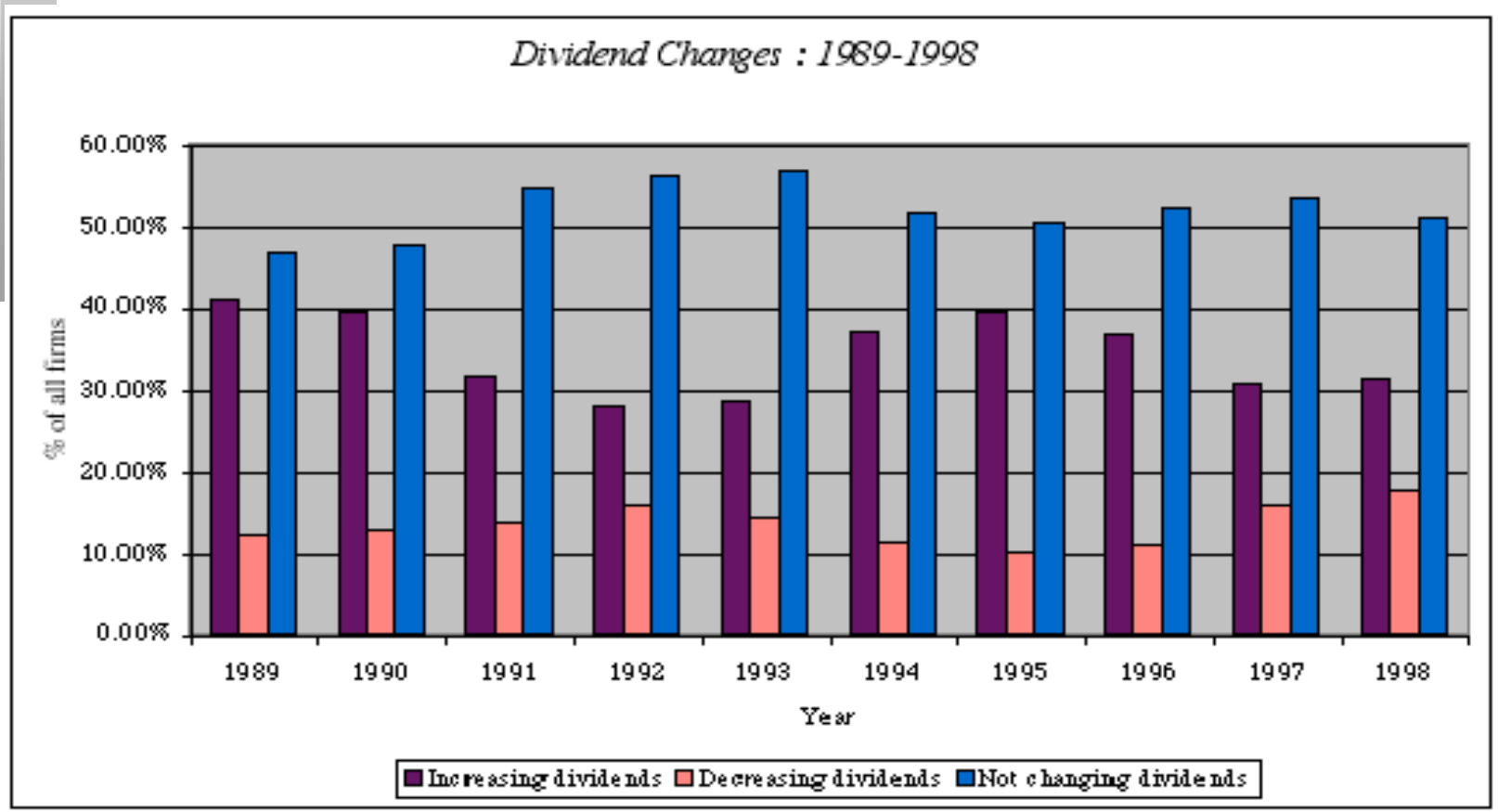
- Invest in projects that yield a return greater than the minimum acceptable hurdle rate.
  - The hurdle rate should be higher for riskier projects and reflect the financing mix used - owners' funds (equity) or borrowed money (debt)
  - Returns on projects should be measured based on cash flows generated 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

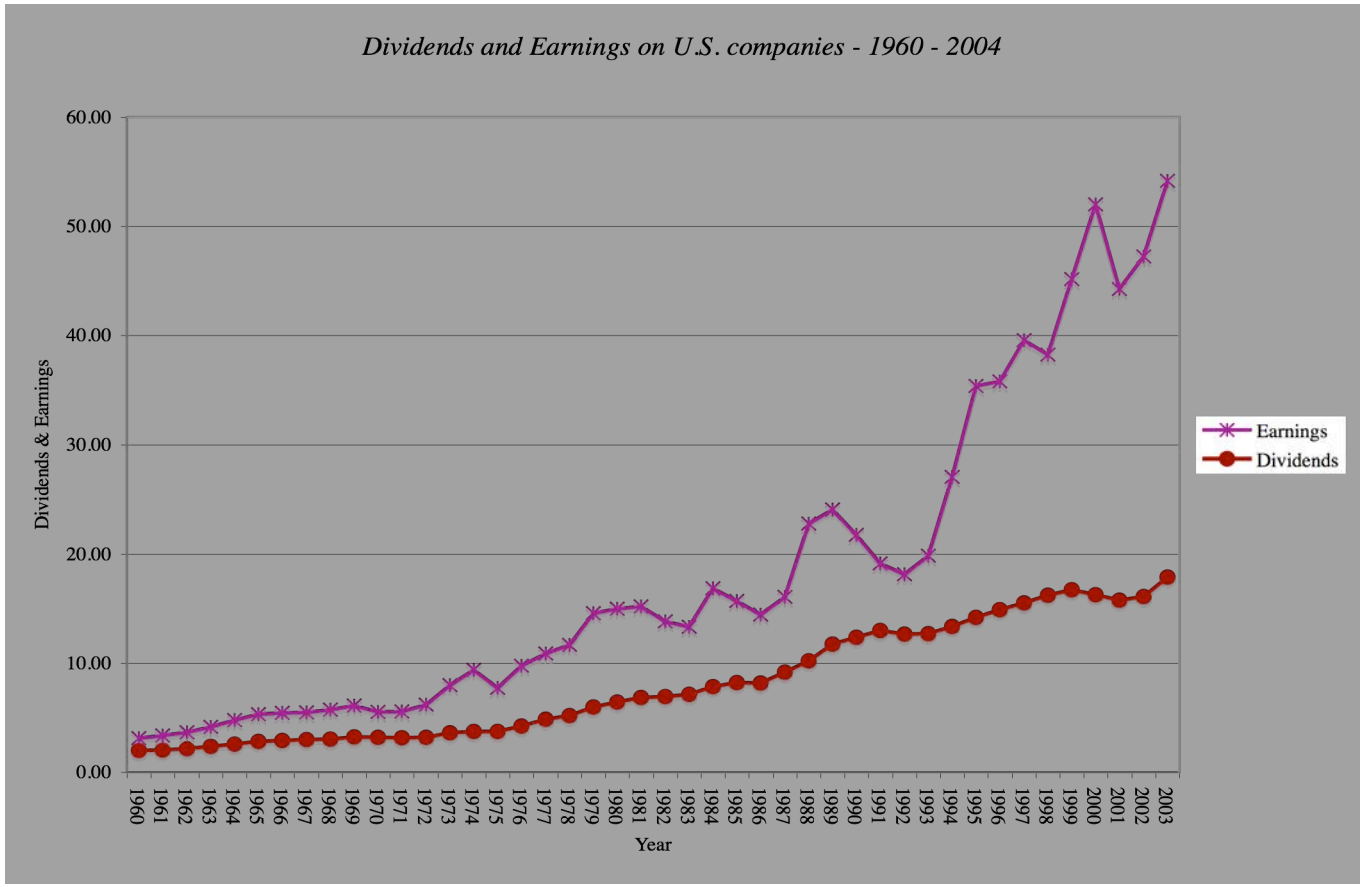
Steps to the Dividend Decision…



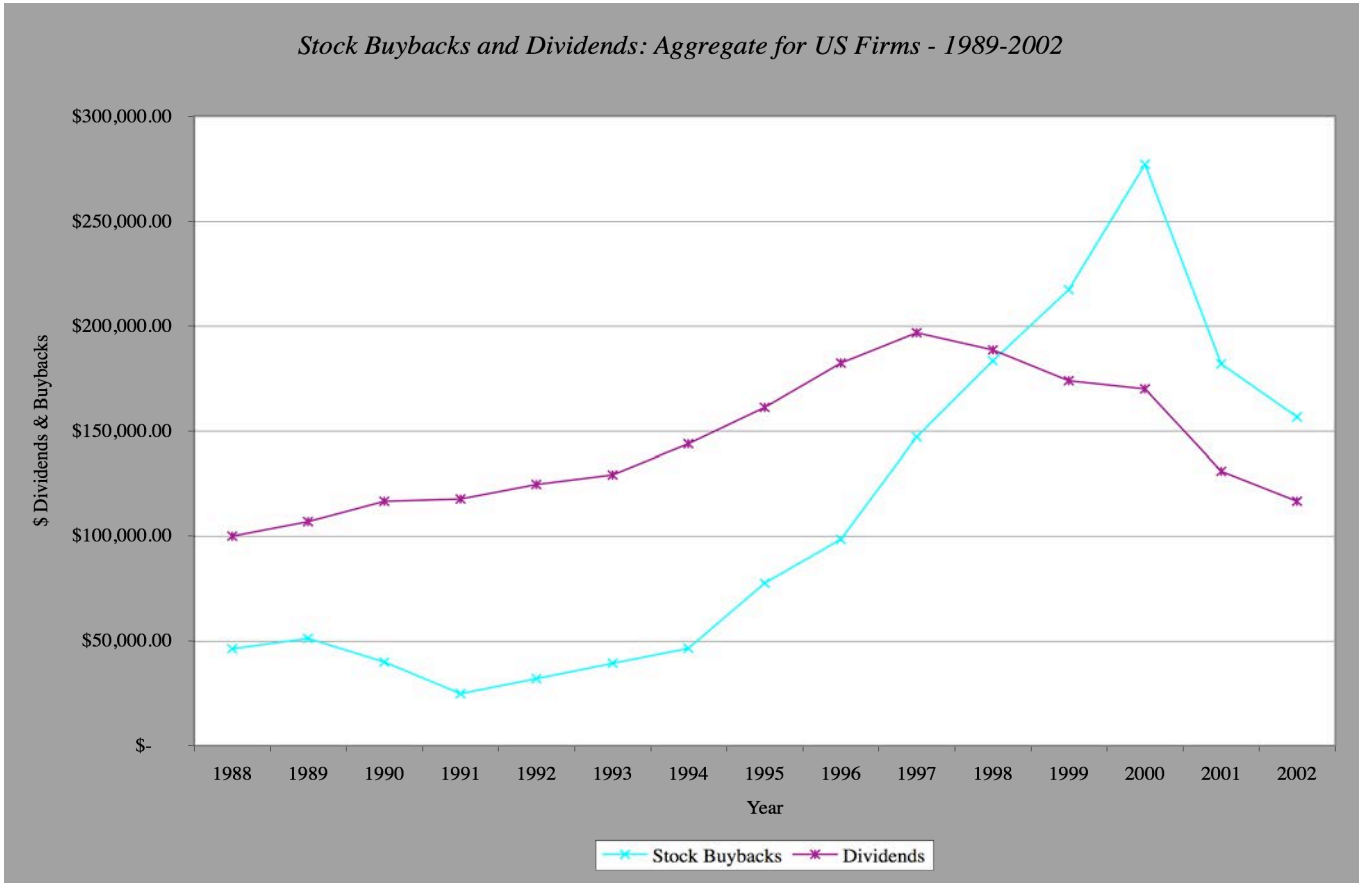
I. Dividends are sticky



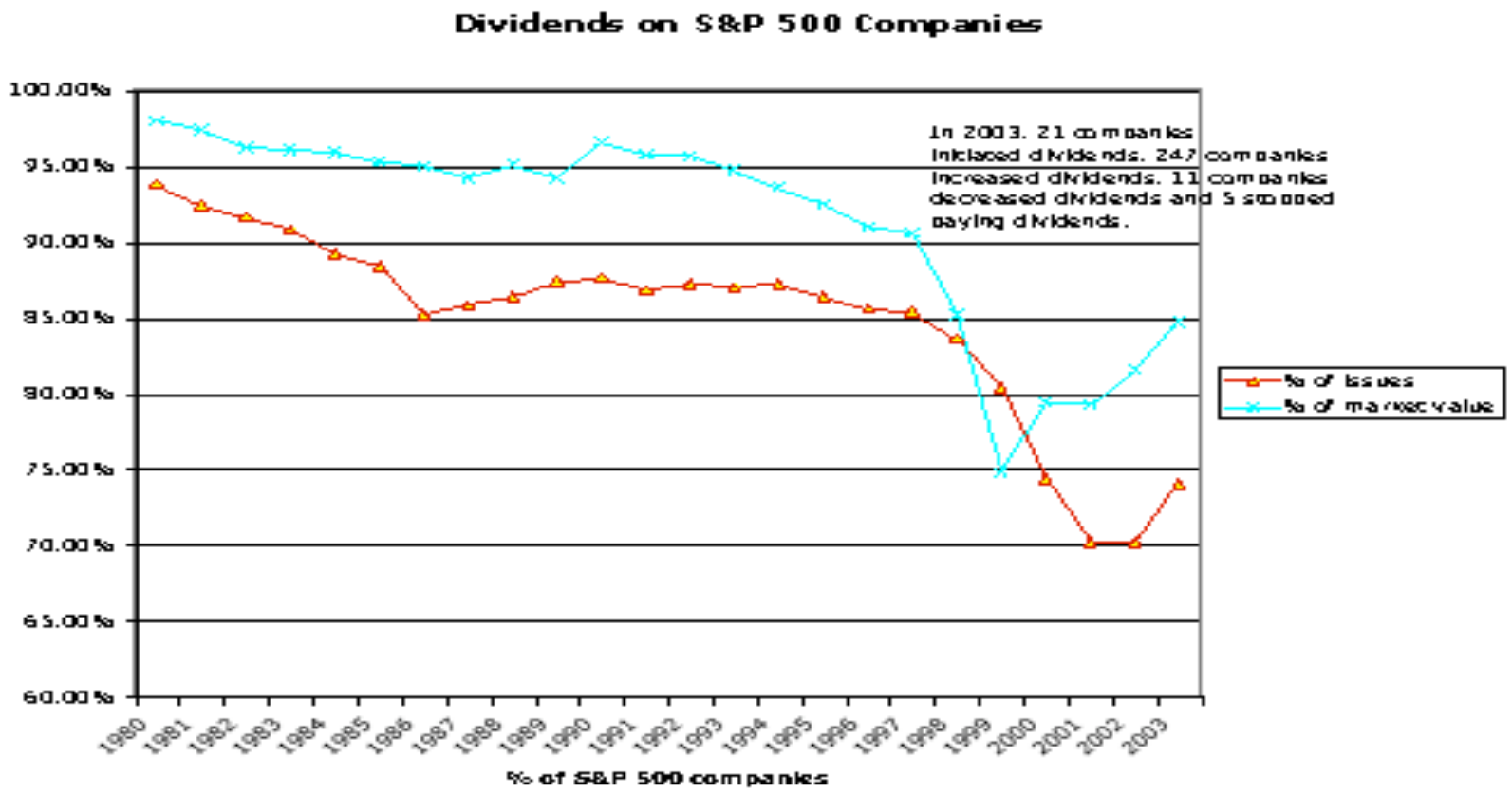
II. Dividends tend to follow earnings



III. More and more firms are buying back stock, rather than pay dividends...



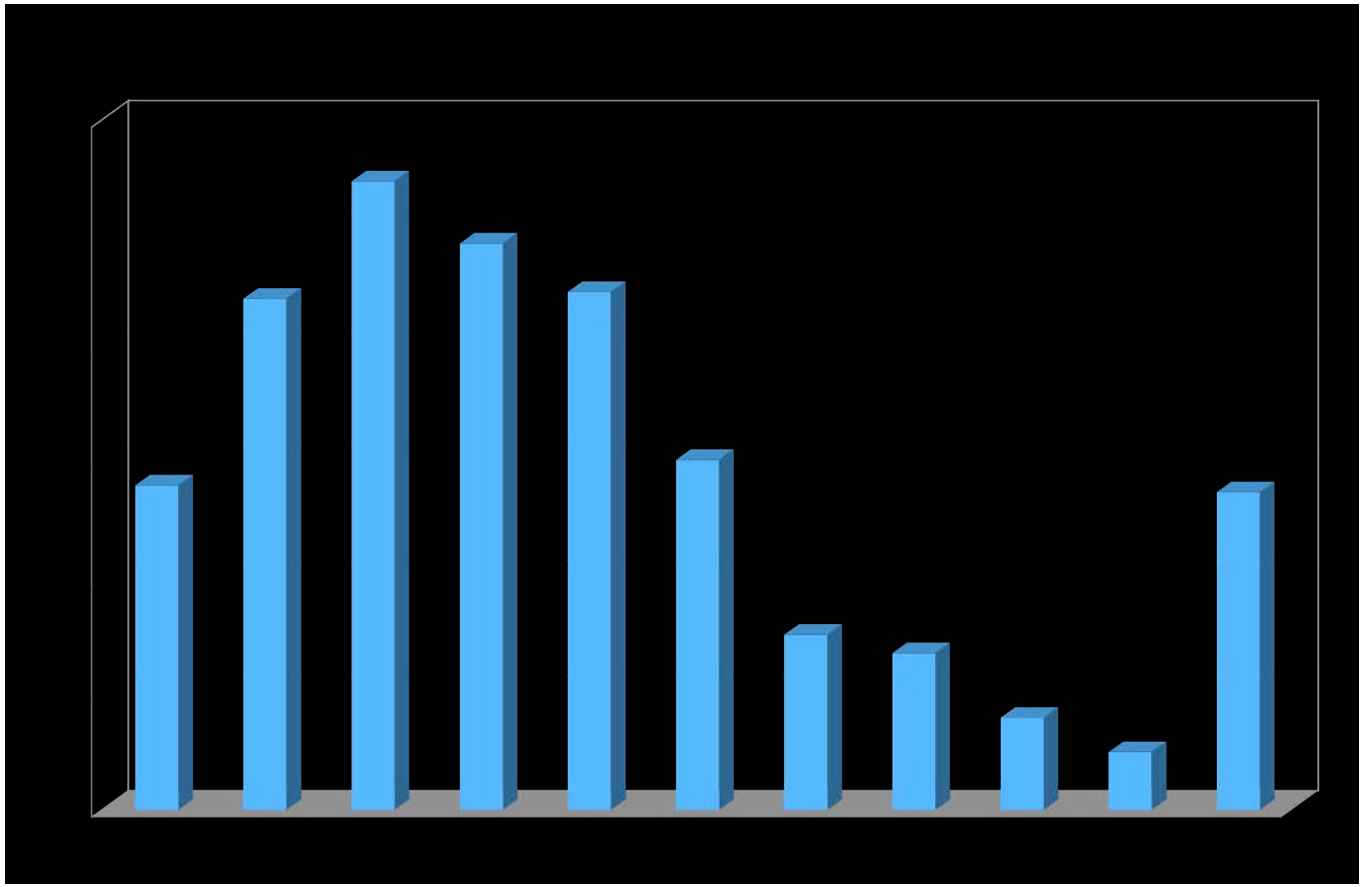
IV. But the change in dividend tax law in 2003 may cause a shift back to dividends



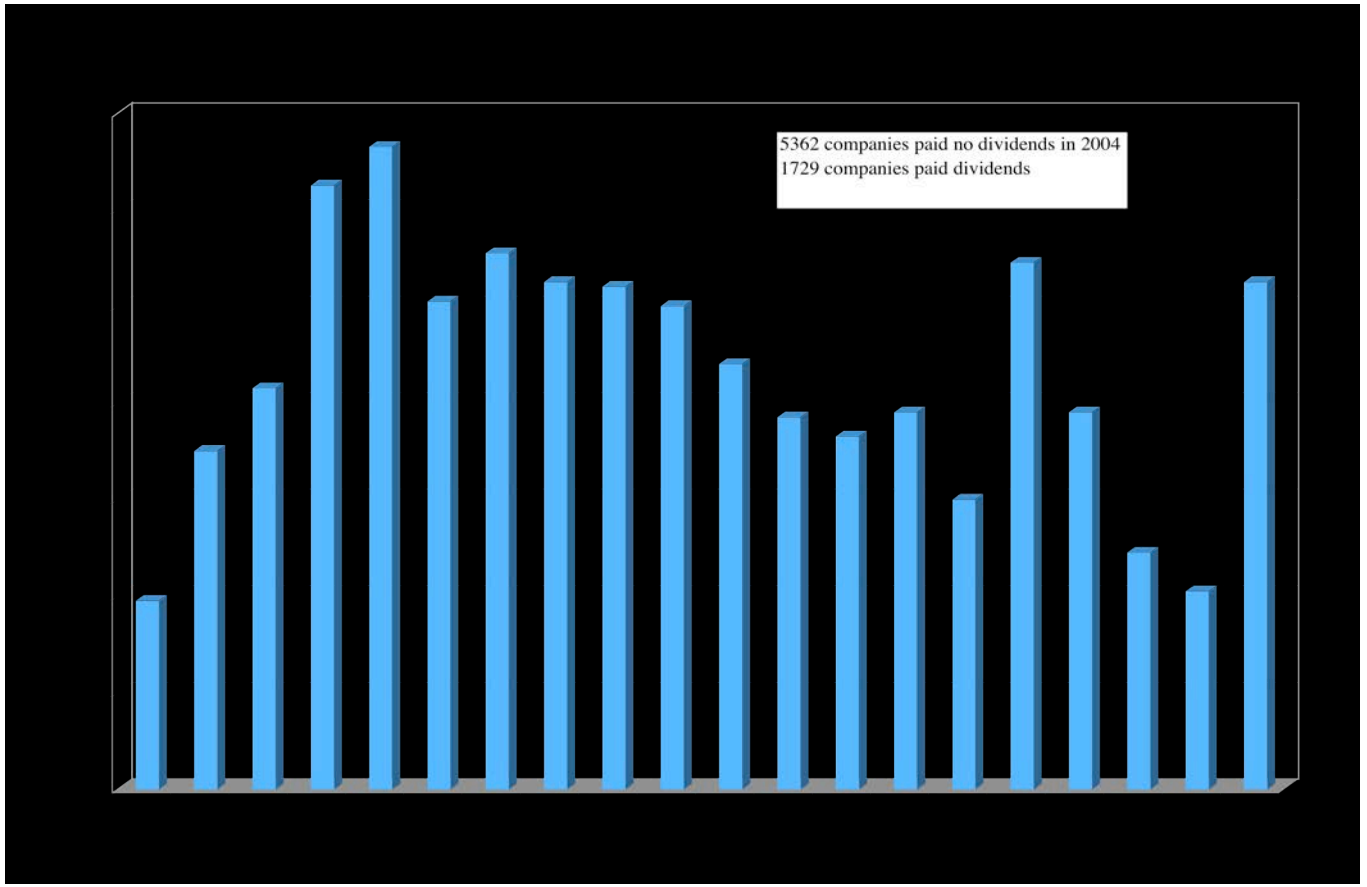
Measures of Dividend Policy

- Dividend Payout:
  - measures the percentage of earnings that the company pays in dividends
  - = Dividends / Earnings
- Dividend Yield :
  - measures the return that an investor can make from dividends alone
  - = Dividends / Stock Price

Dividend Payout Ratios: January 2005



Dividend Yields in the United States: January 2005



Three Schools Of Thought On Dividends

- 1. If
  - (a) there are no tax disadvantages associated with dividends
  - (b) companies can issue stock, at no cost, to raise equity, whenever needed
  - **Dividends do not matter, and dividend policy does not affect value.**
- 2. If dividends have a tax disadvantage,
  - **Dividends are bad, and increasing dividends will reduce value**
- 3. If stockholders like dividends, or dividends operate as a signal of future prospects,
  - **Dividends are good, and increasing dividends will increase value**

The balanced viewpoint

- If a company has excess cash, and few good investment opportunities (NPV>0), returning money to stockholders (dividends or stock repurchases) is good.
- If a company does not have excess cash, and/or has several good investment opportunities (NPV>0), returning money to stockholders (dividends or stock repurchases) is bad.

Assessing Dividend Policy

- Approach 1: The Cash/Trust Nexus
  - Assess how much cash a firm has available to pay in dividends, relative what it returns to stockholders. Evaluate whether you can trust the managers of the company as custodians of your cash.
- Approach 2: Peer Group Analysis
  - Pick a dividend policy for your company that makes it comparable to other firms in its peer group.

I. The Cash/Trust Assessment

- 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

Estimating FCFE when Leverage is Stable

Net Income

- (1- δ) (Capital Expenditures - Depreciation)

- (1- δ) Working Capital Needs

= Free Cash flow to Equity

δ = Debt/Capital Ratio

For this firm,

- Proceeds from new debt issues = Principal Repayments + δ (Capital Expenditures - Depreciation + Working Capital Needs)

An Example: FCFE Calculation

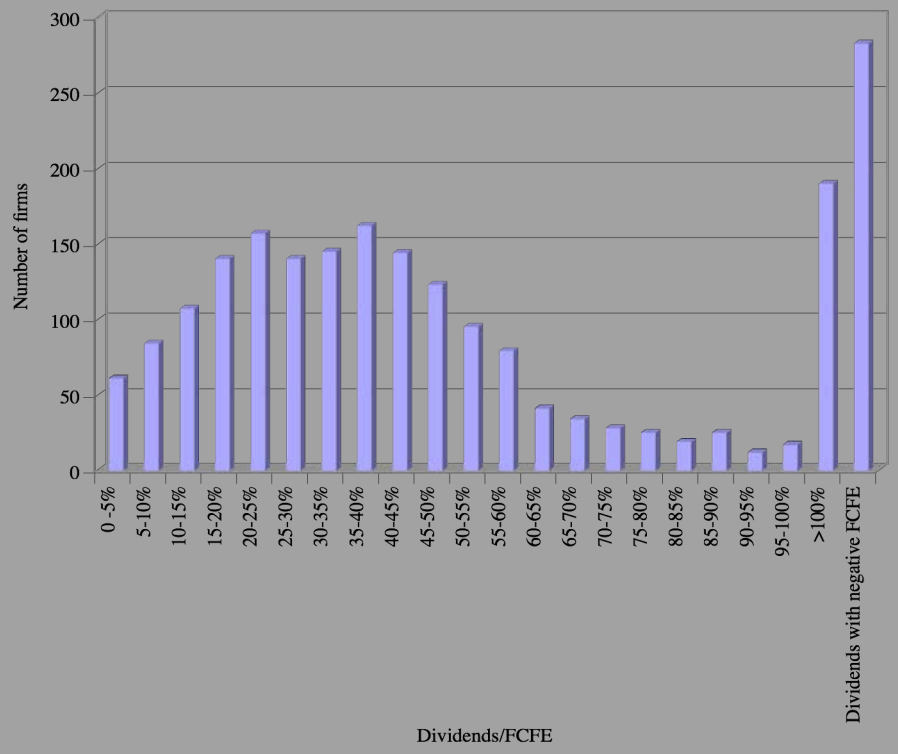
- Consider the following inputs for Microsoft in 1996. In 1996, Microsoft's FCFE was:
  - Net Income = $2,176 Million
  - Capital Expenditures = $494 Million
  - Depreciation = $ 480 Million
  - Change in Non-Cash Working Capital = $ 35 Million
  - Debt Ratio = 0%
- FCFE = Net Income - (Cap ex - Depr) (1-DR) - Chg WC (!-DR)
  = $ 2,176 - (494 - 480) (1-0) - $ 35 (1-0)
  = $ 2,127 Million

Microsoft: Dividends?

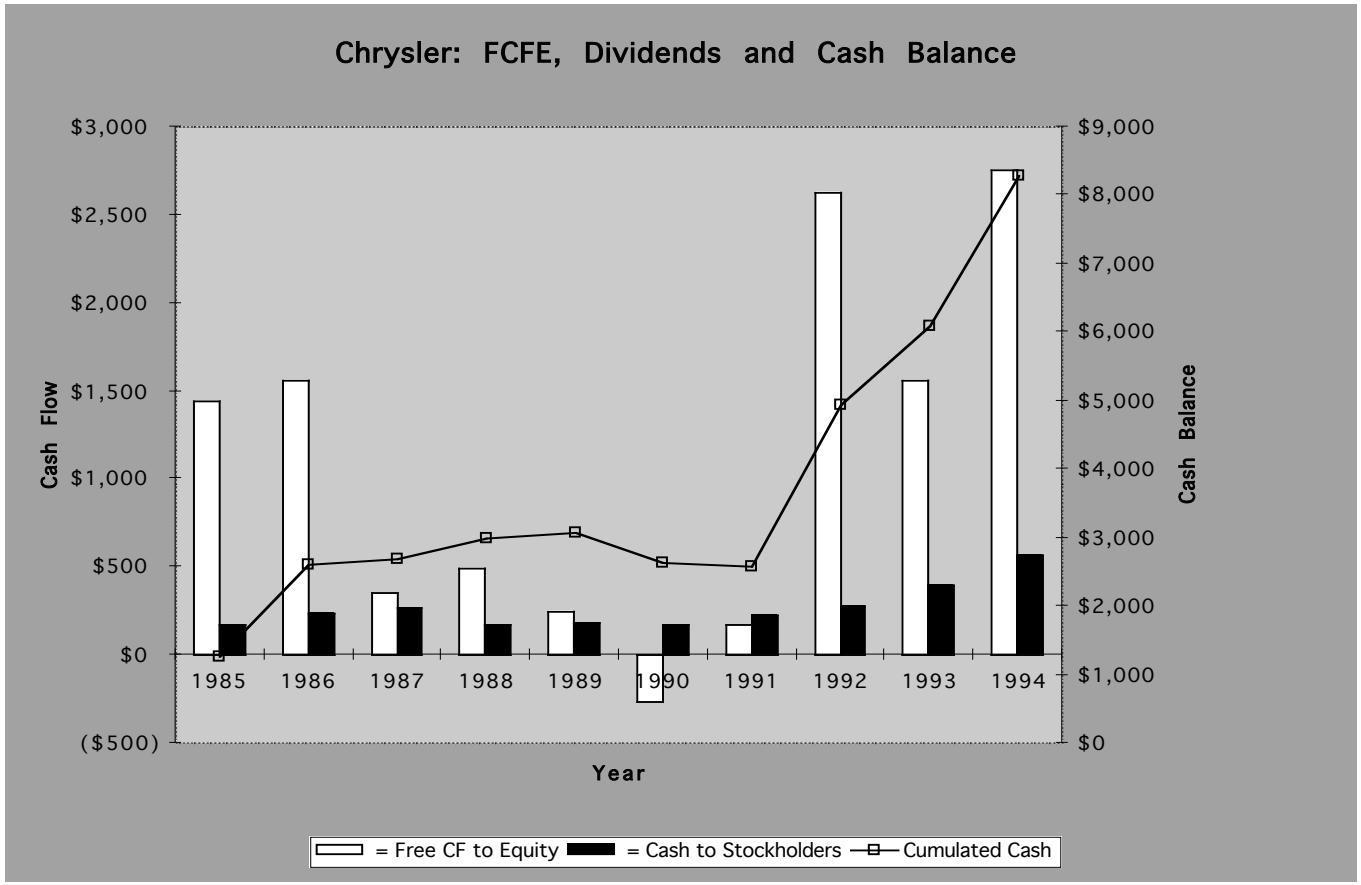
- By this estimation, Microsoft could have paid $ 2,127 Million in dividends/stock buybacks in 1996. They paid no dividends and bought back no stock. Where will the $2,127 million show up in Microsoft's balance sheet?

Dividends versus FCFE: U.S.

Figure 11.2: Dividends paid as % of FCFE



The Consequences of Failing to pay FCFE



Application Test: Estimating your firm's FCFE

In General,

Net Income
+ Depreciation & Amortization
- Capital Expenditures
- Change in Non-Cash Working Capital
- Preferred Dividend
- Principal Repaid
+ New Debt Issued

= FCFE

Compare to

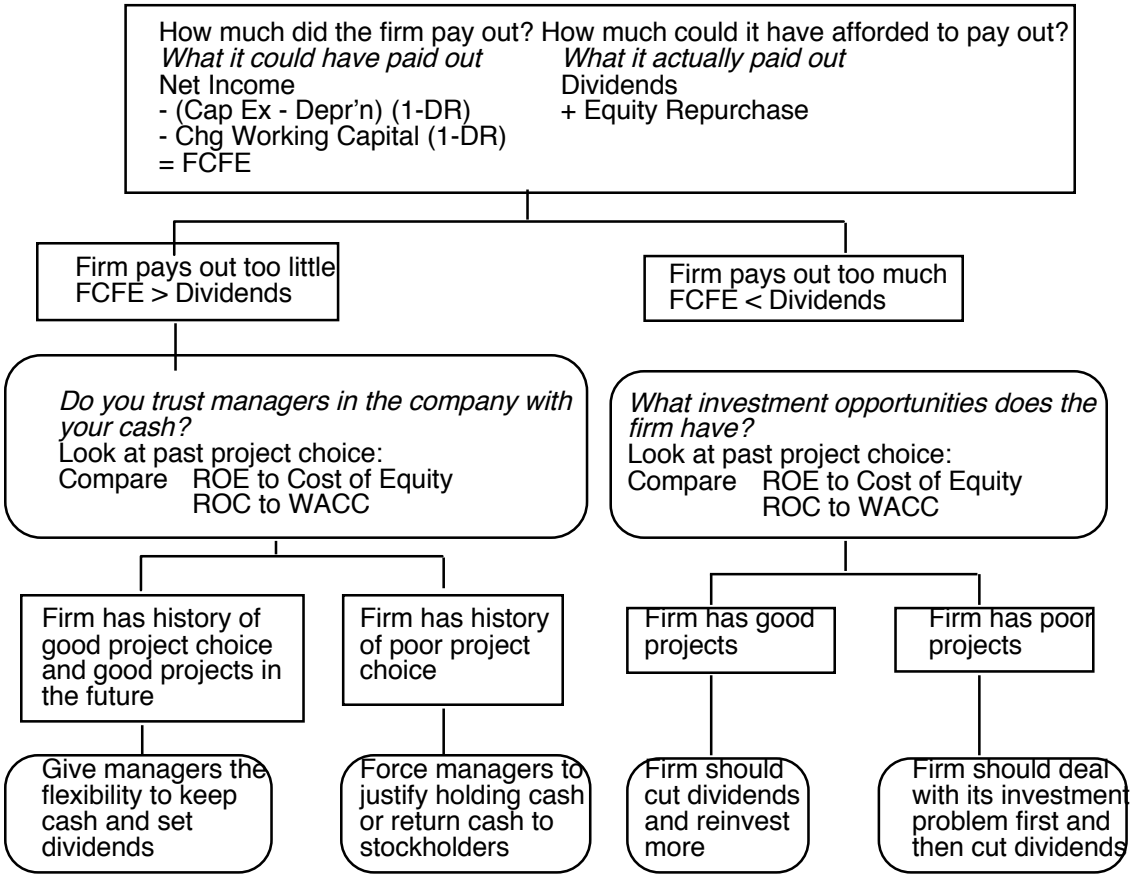
Dividends (Common)
+ Stock Buybacks

If cash flow statement used

Net Income
+ Depreciation & Amortization
+ Capital Expenditures
+ Changes in Non-cash WC
+ Preferred Dividend
+ Increase in LT Borrowing
+ Decrease in LT Borrowing
+ Change in ST Borrowing
= FCFE

-Common Dividend
- Decrease in Capital Stock
+ Increase in Capital Stock

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

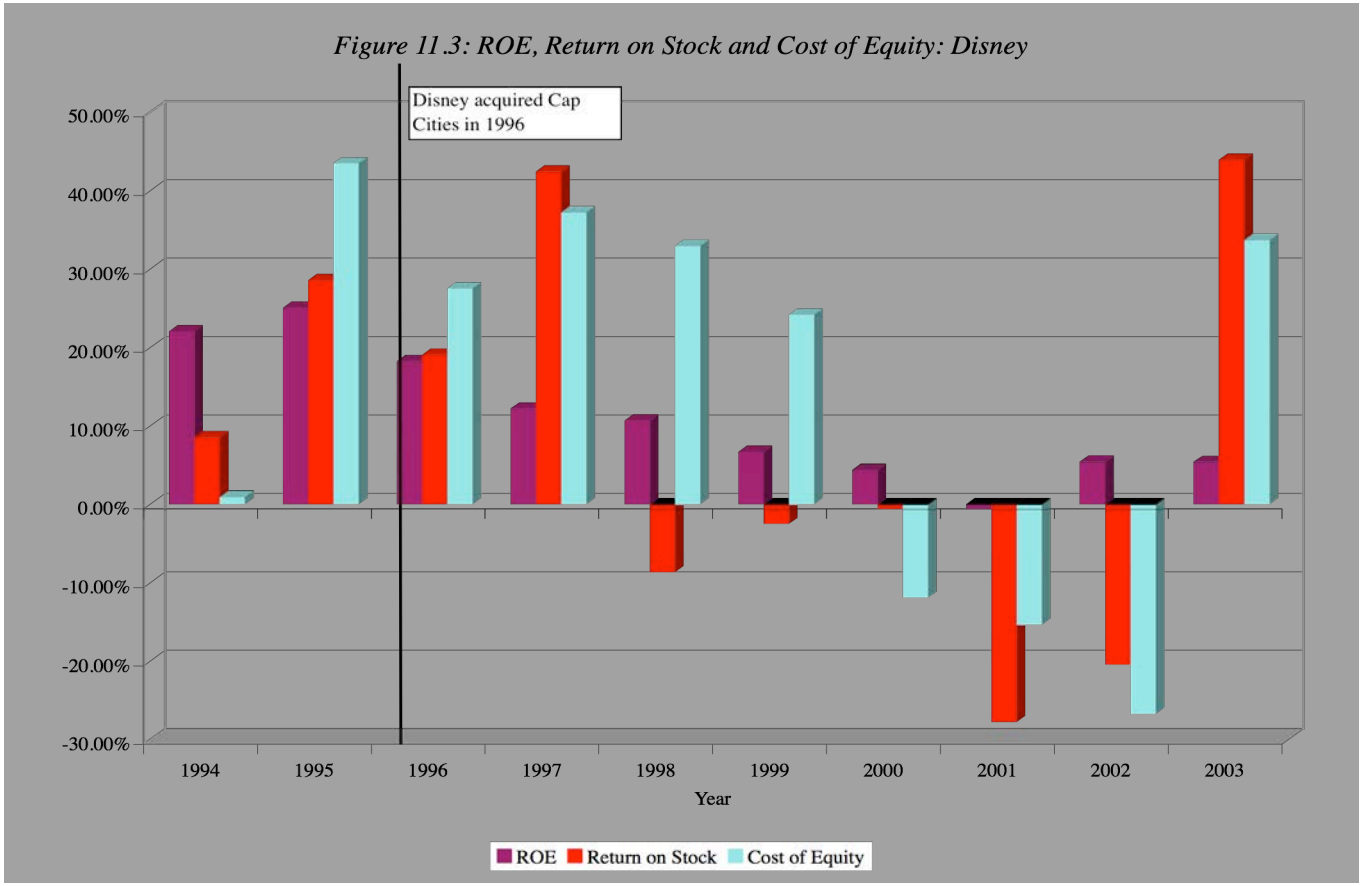
Disney's Dividends and Buybacks from 1994 to 2003

	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 were $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.

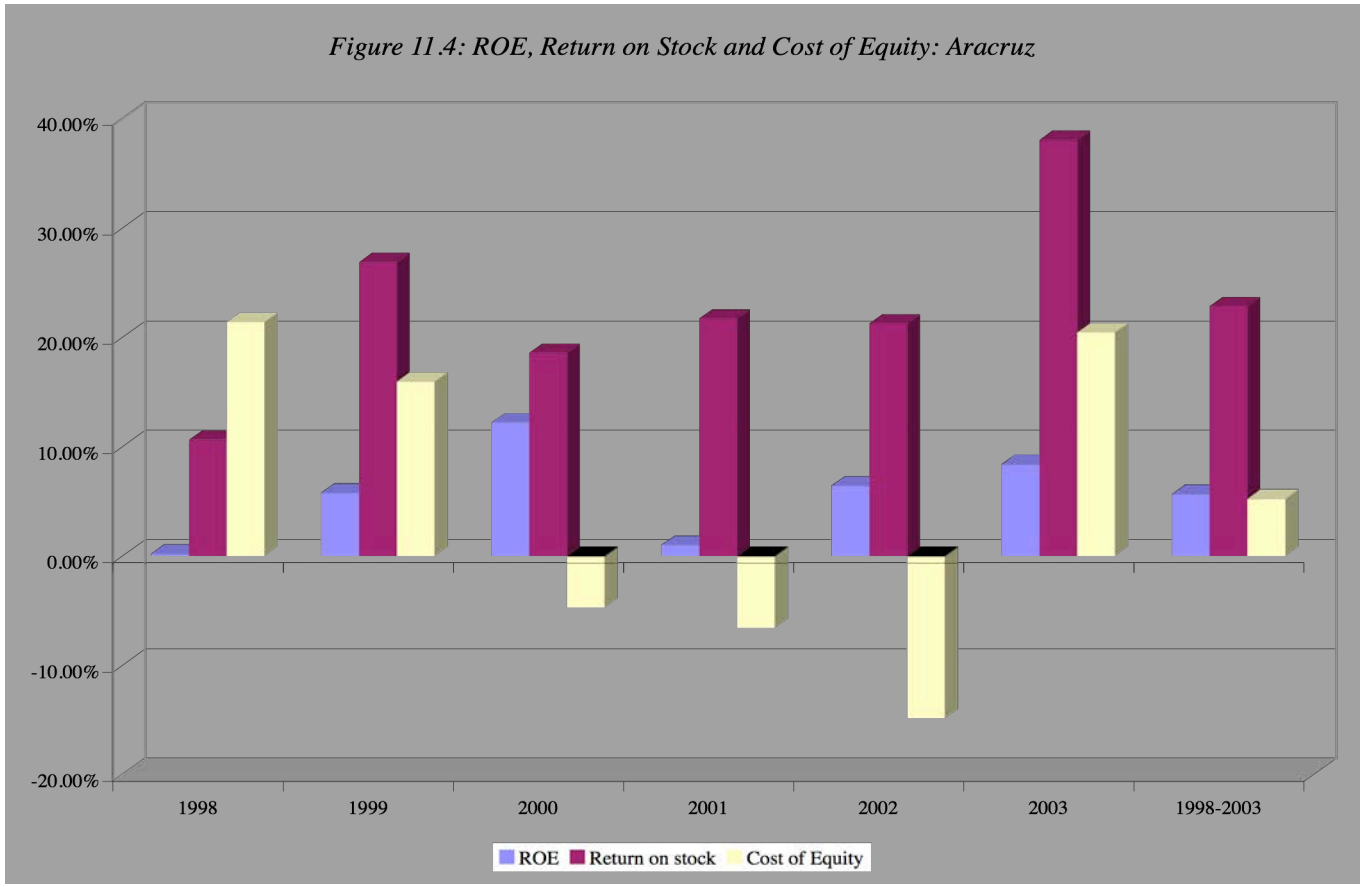
Aracruz: Dividends and FCFE: 1998-2003

Year	Net Income	Depreciation	Capital Expenditures	Change in non-cash WC	FCFE (before net Debt CF)	Net Debt Cashflow	FCFE (after net Debt CF)
1998	$3.45	$152.80	$88.31	$76.06	($8.11)	$174.27	$166.16
1999	$90.77	$158.83	$56.47	$2.18	$190.95	($604.48)	($413.53)
2000	$201.71	$167.96	$219.37	$12.30	$138.00	($292.07)	($154.07)
2001	$18.11	$162.57	$421.49	($56.76)	($184.06)	$318.24	$134.19
2002	$111.91	$171.50	$260.70	($5.63)	$28.34	$36.35	$64.69
2003	$148.09	$162.57	$421.49	($7.47)	($103.37)	$531.20	$427.83
Average	$95.67	$162.70	$244.64	$3.45	$10.29	$27.25	$37.54

Aracruz: Cash Returned to Stockholders

Year	Net Income	Dividends	Payout Ratio	FCFE	Cash returned to Stockholders	Cash Returned/FCFE
1998	$3.45	$24.39	707.51%	$166.16	$50.79	30.57%
1999	$90.77	$18.20	20.05%	($413.53)	$18.20	NA
2000	$201.71	$57.96	28.74%	($154.07)	$80.68	NA
2001	$18.11	$63.17	348.87%	$134.19	$63.17	47.08%
2002	$111.91	$73.80	65.94%	$64.69	$75.98	117.45%
2003	$148.09	$109.31	73.81%	$427.83	$112.31	26.25%
1998-2003	$574.04	$346.83	60.42%	$225.27	$401.12	178.07%

Aracruz: Stock and Project Returns



Aracruz: Its your call..

- Assume that you are a large stockholder in Aracruz. They have been paying more in dividends than they have available in FCFE. Their project choice has been acceptable and your stock has performed well over the period. Would you accept a cut in dividends?
  - Yes
  - No

Mandated Dividend Payouts

- There are many countries where companies are mandated to pay out a certain portion of their earnings as dividends. Given our discussion of FCFE, what types of companies will be hurt the most by these laws?
  - Large companies making huge profits
  - Small companies losing money
  - High growth companies that are losing money
  - High growth companies that are making money

BP: Dividends- 1983-92

	1	2	3	4	5	6	7	8	9	10
Net Income	$1,256.00	$1,626.00	$2,309.00	$1,098.00	$2,076.00	$2,140.00	$2,542.00	$2,946.00	$712.00	$947.00
- (Cap. Exp - Depr)*(1-DR)	$1,499.00	$1,281.00	$1,737.50	$1,600.00	$580.00	$1,184.00	$1,090.50	$1,975.50	$1,545.50	$1,100.00
∂ Working Capital*(1-DR)	$369.50	($286.50)	$678.50	$82.00	($2,268.00)	($984.50)	$429.50	$1,047.50	($305.00)	($415.00)
= Free CF to Equity	($612.50)	$631.50	($107.00)	($584.00)	$3,764.00	$1,940.50	$1,022.00	($77.00)	($528.50)	$262.00
Dividends	$831.00	$949.00	$1,079.00	$1,314.00	$1,391.00	$1,961.00	$1,746.00	$1,895.00	$2,112.00	$1,685.00
+ Equity Repurchases										
= Cash to Stockholders	$831.00	$949.00	$1,079.00	$1,314.00	$1,391.00	$1,961.00	$1,746.00	$1,895.00	$2,112.00	$1,685.00
Dividend Ratios										
Payout Ratio	66.16%	58.36%	46.73%	119.67%	67.00%	91.64%	68.69%	64.32%	296.63%	177.93%
Cash Paid as % of FCFE	-135.67%	150.28%	-1008.41%	-225.00%	36.96%	101.06%	170.84%	-2461.04%	-399.62%	643.13%
Performance Ratios										
1. Accounting Measure										
ROE	9.58%	12.14%	19.82%	9.25%	12.43%	15.60%	21.47%	19.93%	4.27%	7.66%
Required rate of return	19.77%	6.99%	27.27%	16.01%	5.28%	14.72%	26.87%	-0.97%	25.86%	7.12%
Difference	-10.18%	5.16%	-7.45%	-6.76%	7.15%	0.88%	-5.39%	20.90%	-21.59%	0.54%

BP: Summary of Dividend Policy

	Summary of calculations			
	Average	*Standard Deviation*	*Maximum*	*Minimum*
Free CF to Equity	$571.10	$1,382.29	$3,764.00	($612.50)
Dividends	$1,496.30	$448.77	$2,112.00	$831.00
Dividends+Repurchases	$1,496.30	$448.77	$2,112.00	$831.00
Dividend Payout Ratio	84.77%			
Cash Paid as % of FCFE	262.00%			
ROE - Required return	-1.67%	11.49%	20.90%	-21.59%

BP: Just Desserts!

B.P.'s Shares Plummet After Dividend Is Slashed

By MATTHEW L. WALD

British Petroleum said yesterday that it would cut its dividend by 55 percent, take a pretax restructuring charge of $1.82 billion for the second quarter and lay off 11,500 employees, or 10 percent of its worldwide work force. The moves came five weeks after Robert B. Horton, B.P.'s chairman, resigned under pressure from the company's outside directors.

Analysts anticipated a dividend cut by the oil company, the world's third largest, but the one announced was at the low end of their expectations. In response, shares of the company's American depository rights, each of which represents 12 shares of the London-based company, dropped $3.625, or 7.36 percent, to $45.375. It was the most active issue on the New York Stock Exchange, with 5.89 million shares traded.

The Royal Dutch/Shell group also reported a disappointing quarter yesterday, with earnings on a replacement cost basis — excluding gains or losses on inventory holdings — of $868 million, down 22 percent.

Quick Recovery Seems Unlikely

Adding to the gloom at B.P., the new chief executive, David A. G. Simon, said the prospects for a quick recovery were poor. "External trading conditions are expected to remain difficult, particularly for the downstream oil and chemicals businesses, with growth prospects for the world's economies remaining uncertain," he said in a statement. Downstream oil is an industry term for refining and marketing operations, as distinct from oil production.

Downstream margins in the United States would be hurt later this year, he predicted, when clean air rules take effect and gasoline must be reformulated to reduce pollution. "In Europe, recovery will depend upon seasonal heating oil demand," Mr. Simon said.

The crude oil market, he predicted, would remain balanced unless Iraqi oil was allowed to re-enter the market. The company said it was well positioned to take advantage of any increase in oil prices, but the company's oil production in the United States is declining. B.P. is the largest producer in Alaska.

> The giant British oil company bet on rising oil prices.

The market for petrochemicals in Europe remains weak.

B.P.'s second quarter profits, before one-time transactions, declined to $193 million from $515 million, valuing inventories on a replacement-cost basis. James J. Murchie, an analyst at Stanford C. Bernstein, estimated that after exceptional items, earnings per share fell to 30 cents in the second quarter, compared with 62 cents a year earlier.

Analysts attributed B.P.'s problems to the company's acquisitions in the last few years, and heavy capital expenditures. Summing up the company's recent history, Frank P. Kneuttel of Prudential Securities Research said, "Debt rose, interest expense rose, and profits have gone to hell."

Mr. Murchie, who worked for Standard Oil of Ohio and then B.P. after B.P. acquired Sohio, said, "What you've got is a company that thought oil prices were going to go to $25 and spent like it, in terms of capital." If B.P.'s costs of finding oil are the same as the industry average, he said, then the company has been spending enough to replace 120 percent to 130 percent of its annual production, which is not a successful strategy if prices do not rise.

In addition, he said, the company had been spending twice as much on its refining and marketing operation as it was recording in depreciation.

Another analyst at a large stock brokerage house, who spoke on the condition of anonymity, said, "They took all the old Sohio stations and turned them into modern B.P. stations; they took all the B.P. stations and turned them into ultramodern stations."

The analyst said that while some of the cuts were obvious, "some came

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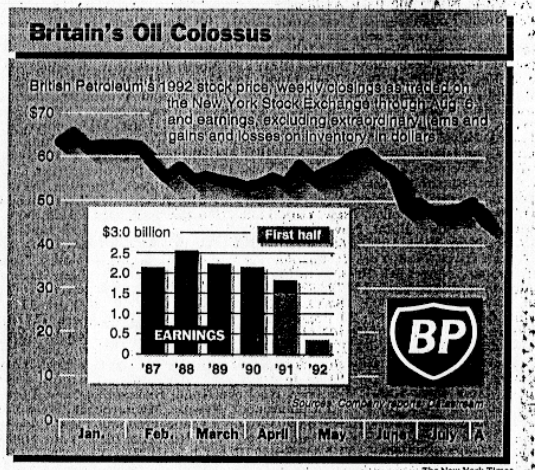


The Limited: Summary of Dividend Policy: 1983-1992

	Summary of calculations			
	Average	*Standard Deviation*	*Maximum*	*Minimum*
Free CF to Equity	($34.20)	$109.74	$96.89	($242.17)
Dividends	$40.87	$32.79	$101.36	$5.97
Dividends+Repurchases	$40.87	$32.79	$101.36	$5.97
Dividend Payout Ratio	18.59%			
Cash Paid as % of FCFE	-119.52%			
ROE - Required return	1.69%	19.07%	29.26%	-19.84%

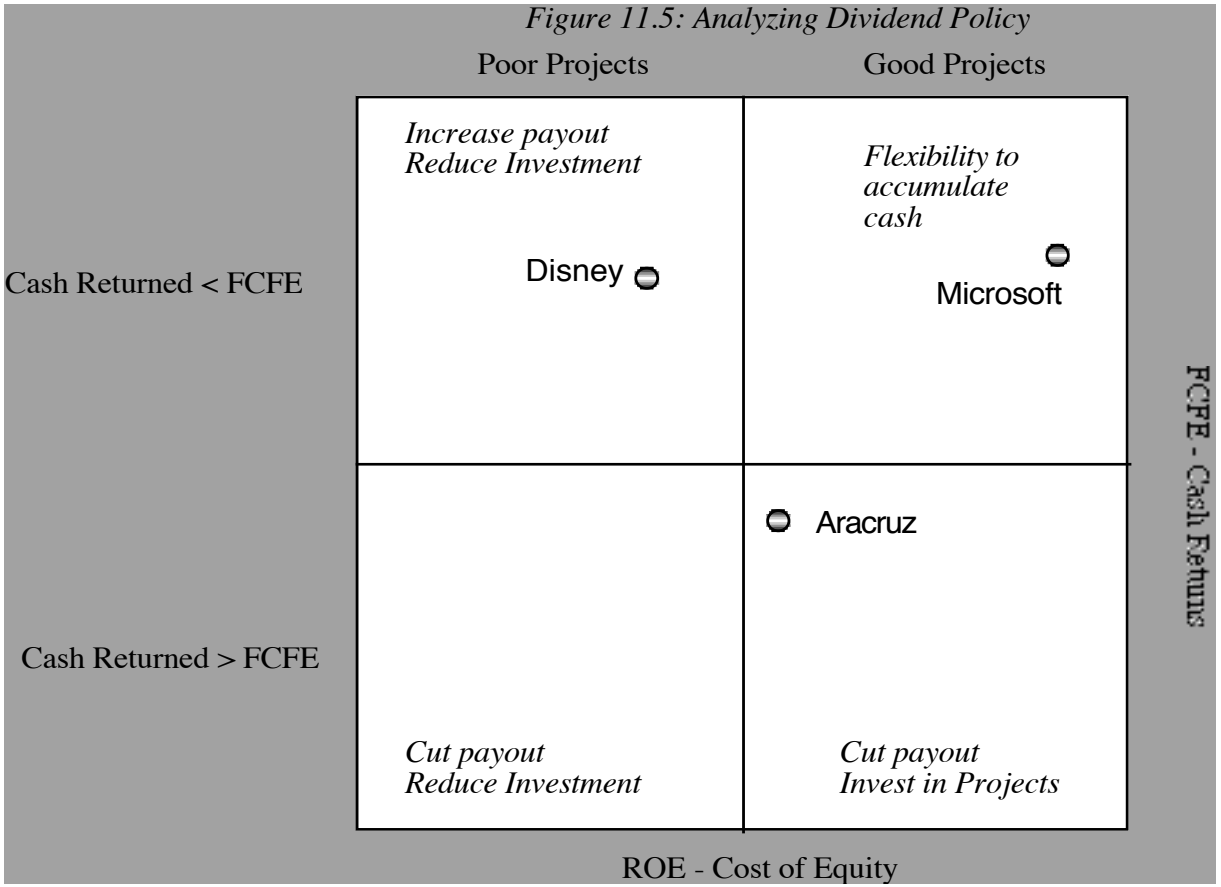
Growth Firms and Dividends

- High growth firms are sometimes advised to initiate dividends because its increases the potential stockholder base for the company (since there are some investors - like pension funds - that cannot buy stocks that do not pay dividends) and, by extension, the stock price. Do you agree with this argument?
  - Yes
  - No

Why?

Summing up…

Figure 11.5: Analyzing Dividend Policy



Valuation

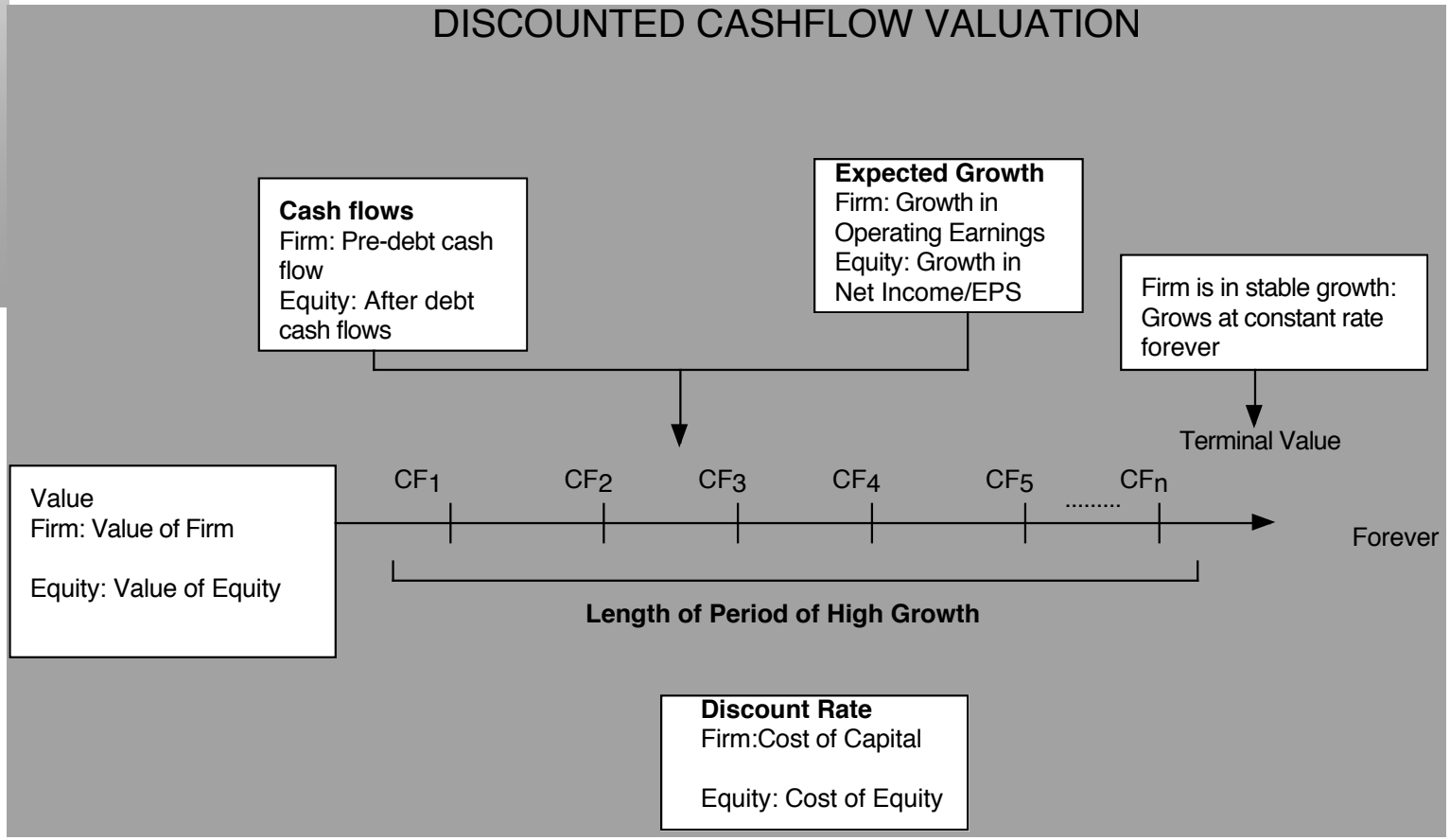
Aswath Damodaran

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

Generic DCF Valuation Model



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

Strategic investments determine length of growth period

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 = **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