



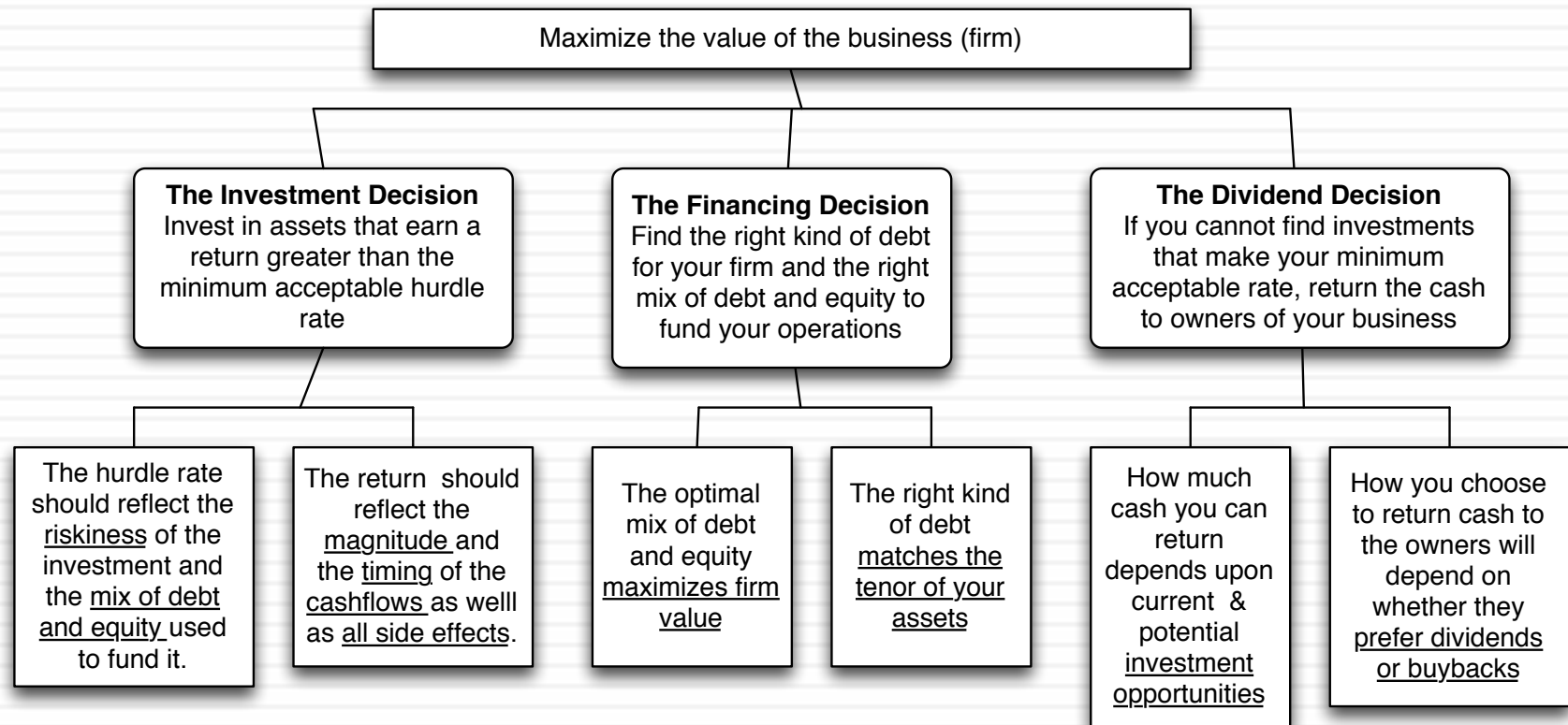
Aswath Damodaran

VALUATION OF INVESTMENTS, PROJECTS AND BUSINESSES

Aswath Damodaran

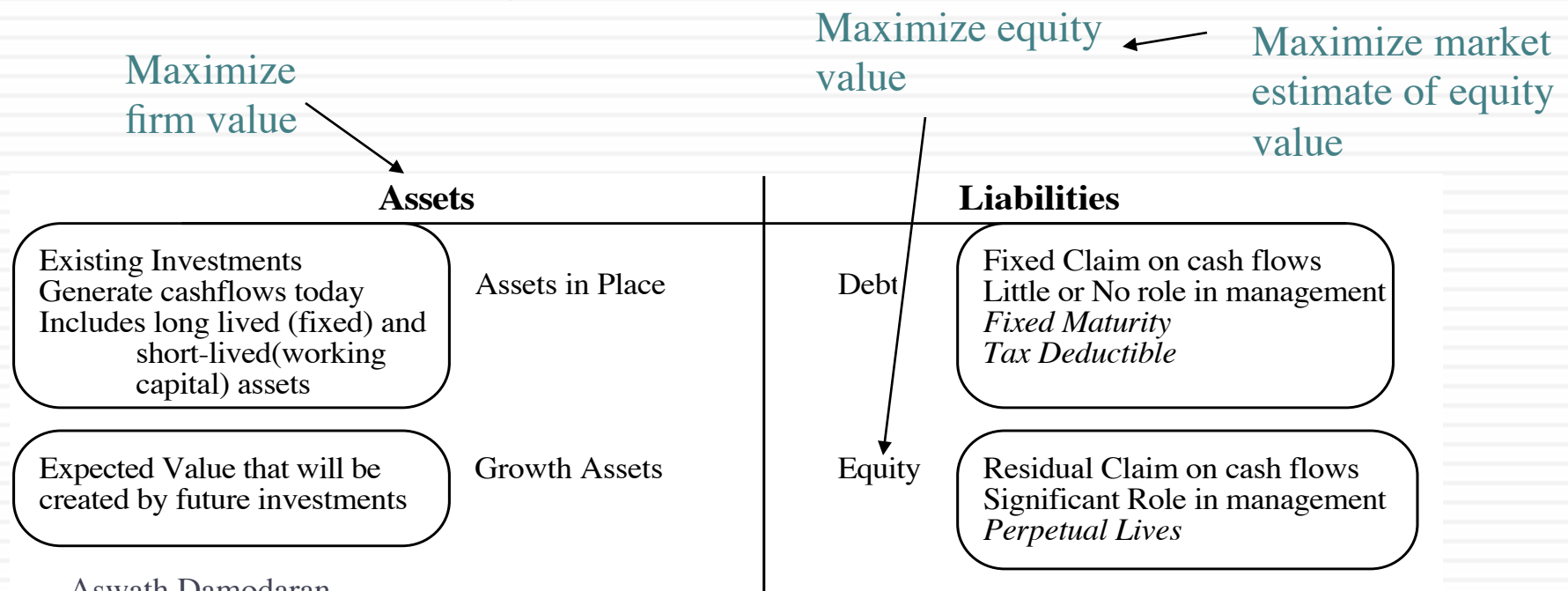
www.damodaran.com

The first principles of corporate finance & the tie to value

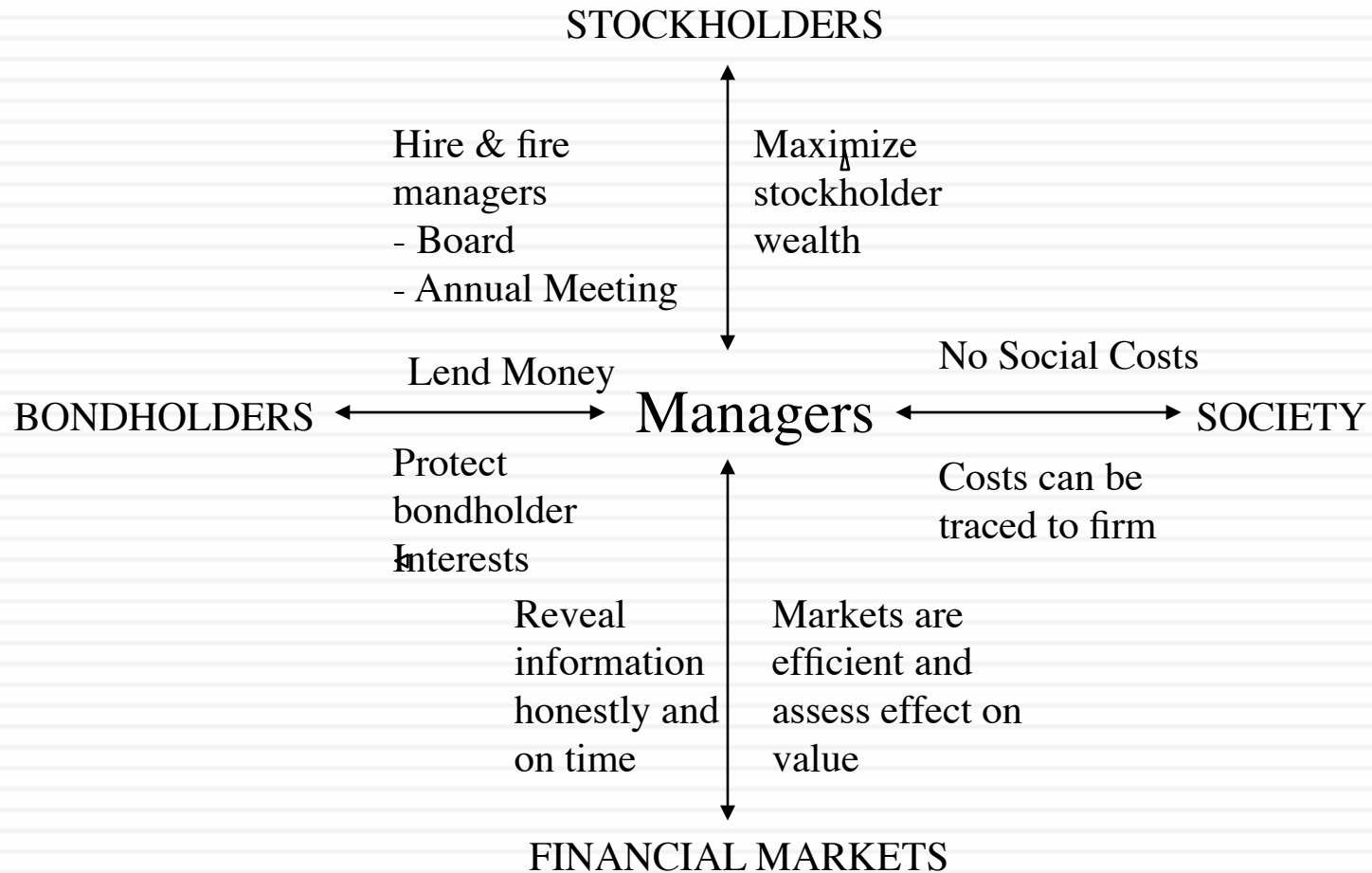


The Objective in Decision Making

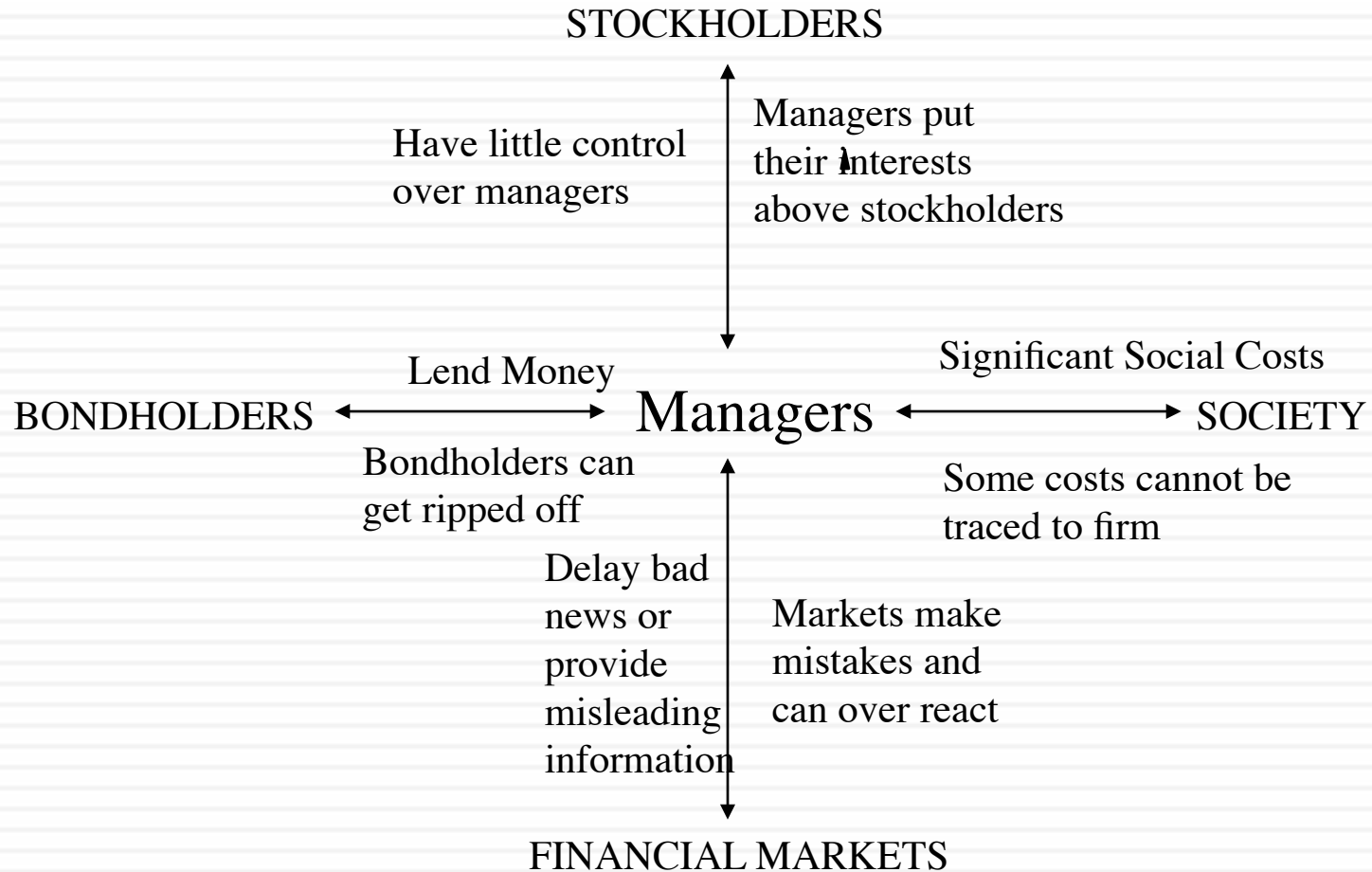
- In traditional corporate finance, the objective in decision making is to maximize the value of the firm.
- A narrower objective is to maximize stockholder wealth. When the stock is traded and markets are viewed to be efficient, the objective is to maximize the stock price.



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

The Yandex Board of Directors

Board of Directors



[Al Fenaughty](#)

Chairman of the Board of Directors



[Elena Ivashentseva](#)

Non-executive Director



[Arkady Volozh](#)

Chief Executive Officer and Executive Director



[John Boynton](#)

Non-executive Director



[Esther Dyson](#)

Non-executive Director



[Alexander Voloshin](#)

Non-executive Director



[Charles Ryan](#)

Non-executive Director



[Rogier Rijnja](#)

Non-executive Director

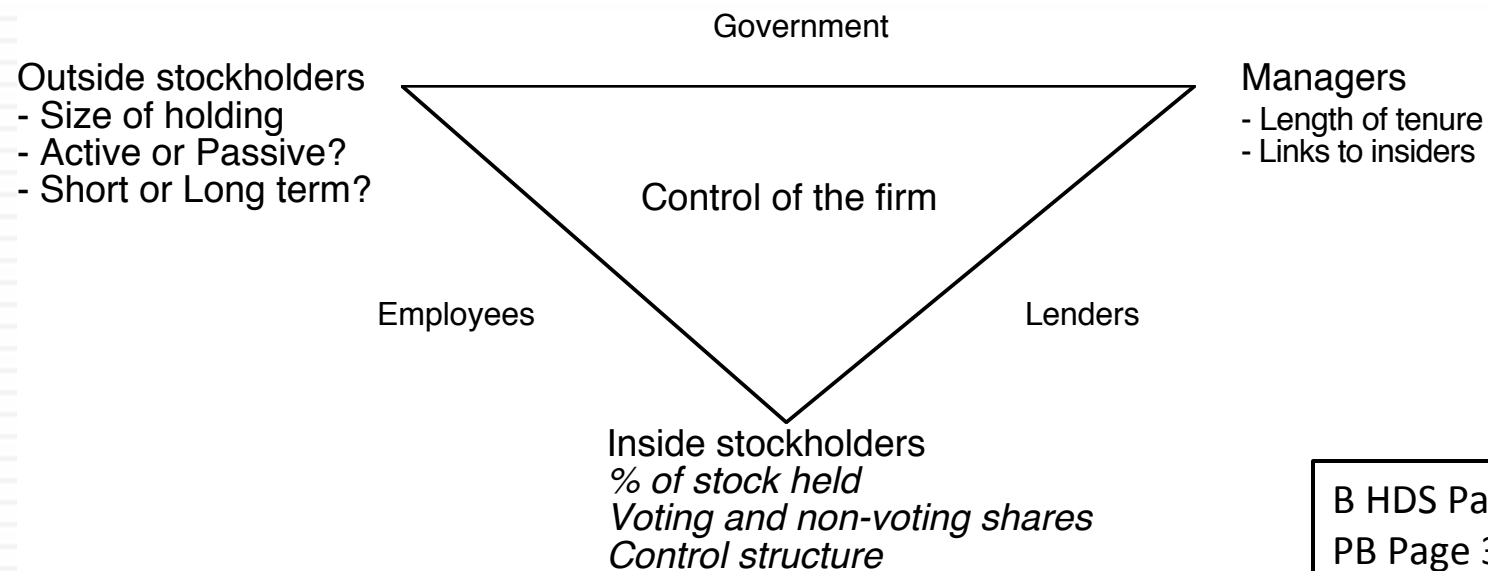
So, what next? When the cat is idle, the mice will play

- When managers do not fear stockholders, they will often put their interests over stockholder interests
 - Greenmail: The (managers of) target of a hostile takeover buy out the potential acquirer's existing stake, at a price much greater than the price paid by the raider, in return for the signing of a 'standstill' agreement.
 - Golden Parachutes: Provisions in employment contracts, that allows for the payment of a lump-sum or cash flows over a period, if managers covered by these contracts lose their jobs in a takeover.
 - Poison Pills: A security, the rights or cashflows on which are triggered by an outside event, generally a hostile takeover, is called a poison pill.
 - Shark Repellents: Anti-takeover amendments are also aimed at dissuading hostile takeovers, but differ on one very important count. They require the assent of stockholders to be instituted.
 - Overpaying on takeovers: Acquisitions often are driven by management interests rather than stockholder interests.

No stockholder approval needed..... Stockholder Approval needed

⌚ Application Test: Who owns/runs your firm?

- Look at: Bloomberg printout HDS for your firm
- Who are the top stockholders in your firm?
- What are the potential conflicts of interests that you see emerging from this stockholding structure?



Case 1: Splintering of Stockholders

Disney's top stockholders in 2003

<HELP> for explanation. dgp Equity HDS
 Enter #<GD> to select aggregate portfolio and see detailed information

001189658224-000		HOLDINGS SEARCH		CUSIP 25468710	
DIS	US	DISNEY (WALT) CO	Page 1 / 100		
Holder name	Portfolio Name	Source	Held	Outstd	Percent Latest Filing Change Date
1 BARCLAYS GLOBAL	BARCLAYS BANK PLC	13F	83,630M	4.095	1,750M 09/02
2 CITIGROUP INC	CITIGROUP INCORPORAT	13F	62,857M	3.078	4,811M 09/02
3 FIDELITY MANAGM	FIDELITY MANAGEMENT	13F	56,125M	2.748	5,992M 09/02
4 STATE STREET	STATE STREET CORPORA	13F	54,635M	2.675	2,239M 09/02
5 SOUTHEASTRN ASST	SOUTHEASTERN ASSET M	13F	47,333M	2.318	14,604M 09/02
6 ST FARM MU AUTO	STATE FARM MUTUAL AU	13F	41,938M	2.054	120,599 09/02
7 VANGUARD GROUP	VANGUARD GROUP INC	13F	34,721M	1.700	-83,839 09/02
8 MELLON BANK N A	MELLON BANK CORP	13F	32,693M	1.601	957,489 09/02
9 PUTNAM INVEST	PUTNAM INVESTMENT MA	13F	28,153M	1.379	-11,468M 09/02
10 LORD ABBETT & CO	LORD ABBETT & CO	13F	24,541M	1.202	5,385M 09/02
11 MONTAG CALDWELL	MONTAG & CALDWELL IN	13F	24,466M	1.198	-11,373M 09/02
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
14 PRICE T ROWE	T ROWE PRICE ASSOCIA	13F	19,133M	0.937	2,925M 09/02
15 ROY EDWARD DISNE	n/a	PROXY	17,547M	0.859	-126,710 12/01
16 AWA FINANCIAL	ALLIANCE CAPITAL MAN	13F	14,283M	0.699	69,353 09/02
17 JP MORGAN CHASE	JP MORGAN CHASE & CO	13F	14,209M	0.696	-462,791 09/02
Sub-totals for current page:			599,159M	29.340	

* Money market directory info available. Select portfolio, then hit IP<GD>.
 Australia 61 2 8777 8600 Brazil 55 11 3048 4500 Europe 44 20 7330 7500 Germany 49 69 306410
 Hong Kong 852 2577 6000 Japan 81 3 3201 0900 Singapore 65 212 1000 U.S. 1 212 318 2000 Copyright 2002 Bloomberg L.P.
 H002-375-0 20-0ec-02 13:41:58



Case 2: Yandex's largest stockholders, in class A shares

YNDX US Equity 2) Settings 9) Feedback Holders: Current
 Yandex NV ISIN NL0009805522

1) Current 2) Historical 3) Matrix 4) Ownership 5) Transactions 6) Options

Search Name -- 1) Save 2) Delete 3) Saved Searches 4) Refine Search

Text Search Holder Group All Holders 2) Export

Holder Name	Portfolio Name	Source	Opt	Amt Held	% Out	Latest Chg File Dt	
1. ■ OPPENHEIMERFUNDS INCORP	OPPENHEIMER FUNDS IN	13F	All Sources	34,742,700	13.87	11,675,012	03/31/14
2. ■ CAPITAL GROUP COMPANIES	n/a	ULT-AGG	All	32,690,159	13.05	8,347,700	03/31/14
3. ■ VONTOBEL HOLDING AG	n/a	ULT-AGG		11,720,238	4.68	2,392,482	03/31/14
4. ■ THORNBURG INVESTMENT MG	THORNBURG INVESTMEN	13F		8,046,043	3.21	-10,304,844	03/31/14
5. ■ VOLOZH ARKADY	n/a	20F		5,655,386	2.26	0	03/01/13
6. ■ COMGEST S A	Multiple Portfolios	MF-AGG		5,631,829	2.25	-2,139,583	12/31/13
7. ■ T ROWE PRICE GROUP INC	n/a	ULT-AGG		5,235,195	2.09	2,119,300	03/31/14
8. ■ BLACKROCK	n/a	ULT-AGG		4,895,598	1.95	-4,061,665	03/31/14
9. ■ MAVERICK CAPITAL LTD	MAVERICK CAPITAL LTD	13F		4,397,460	1.76	1,139,152	03/31/14
10. ■ MANNING & NAPIER ADVISOR	MANNING & NAPIER ADV	13F		3,794,470	1.51	369,070	03/31/14
11. ■ LAZARD LTD	n/a	ULT-AGG		3,764,531	1.50	258,654	04/30/14
12. ■ COLUMBIA WANGER ASSET MA	COLUMBIA WANGER ASSE	13F		3,723,303	1.49	885,307	03/31/14
13. ■ HARDING LOEVNER LP	HARDING LOEVNER LP	13F		3,710,655	1.48	3,710,655	03/31/14
14. ■ WELLS FARGO & COMPANY	n/a	ULT-AGG		3,622,694	1.45	-124,591	03/31/14
15. ■ UFG PRIV EQ FD II	n/a	20F		3,515,186	1.40	0	03/01/13
16. ■ HARRIS TRUST & SAVINGS B	Multiple Portfolios	MF-AGG		3,238,756	1.29	720,646	03/31/14
17. ■ BC&B HOLDINGS BV	n/a	13D		2,946,964	1.18	0	02/24/14
18. ■ MORGAN STANLEY	n/a	ULT-AGG		2,412,063	0.96	0	04/30/14
19. ■ AMERICAN CENTURY COMPAN	AMERICAN CENTURY COM	13F		2,273,553	0.91	306,499	03/31/14

% Out 87.40 Short Interest % Out 3.59 Zoom - 0 + 100%

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2014 Bloomberg Finance L.P.
 SN 636136 EDT GMT-4:00 G597-1139-0 28-May-2014 11:34:32

1.00 in

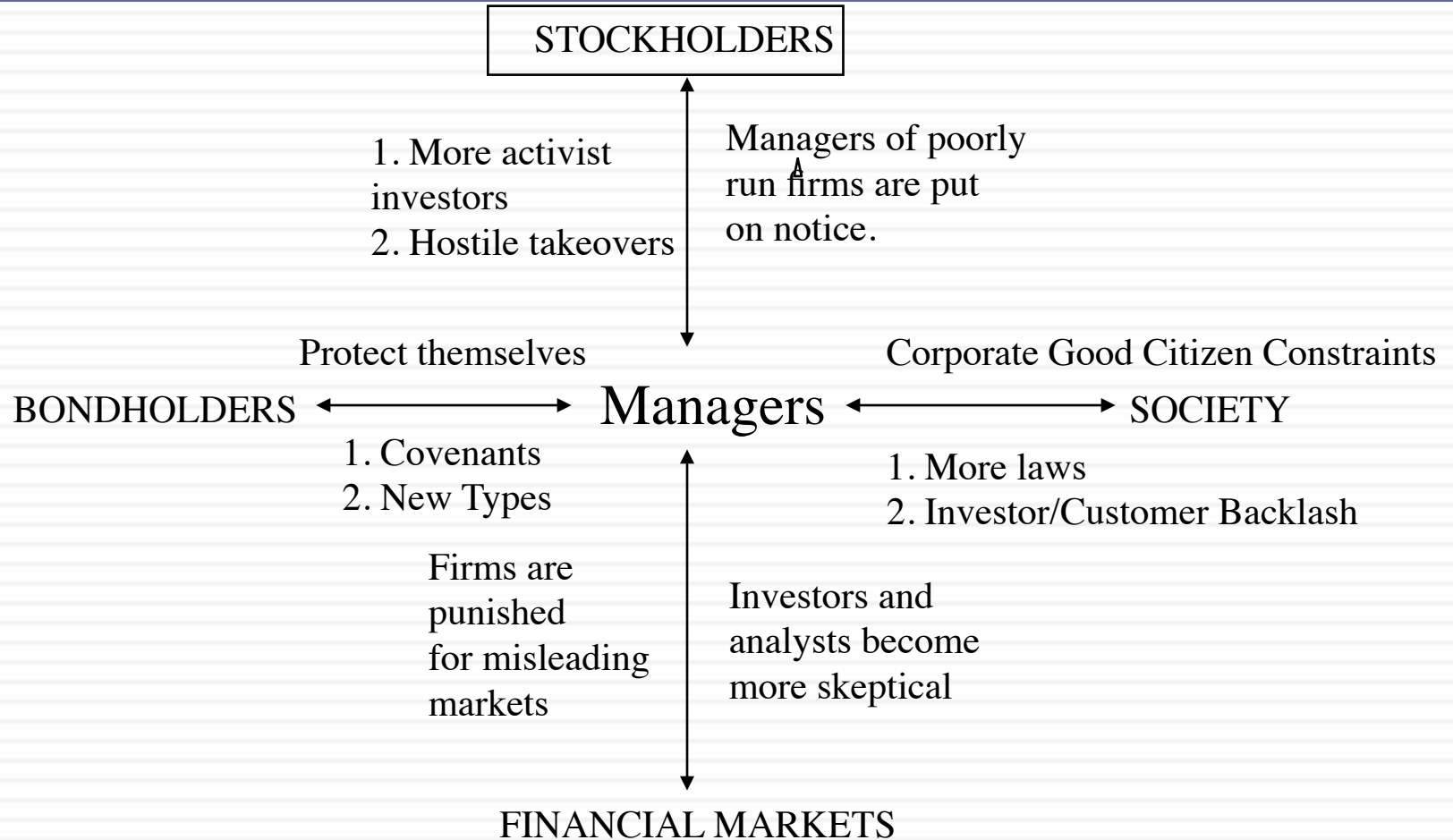
Yandex: The rest of the story

	<i>Number</i>	<i>% of shares</i>	<i>Voting rights/share</i>	<i>Voting Rights</i>	<i>% of votes</i>
Class A	250.529	72.29%	1	250.529	26.12%
Class B	70.87	20.45%	10	708.7	73.88%
Class C	25.164	7.26%	Null	Null	Null
Golden Shares	1		Held by Sberbank (Russian Government)	Control veto of anyone acquiring >25%	

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

- To choose a different mechanism for corporate governance, i.e., assign the responsibility for monitoring managers to someone other than stockholders.
- 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
 - ▣ Protect lenders from expropriation
 - ▣ By providing information honestly and promptly to financial markets
 - ▣ Minimize social costs

A Market Based Solution



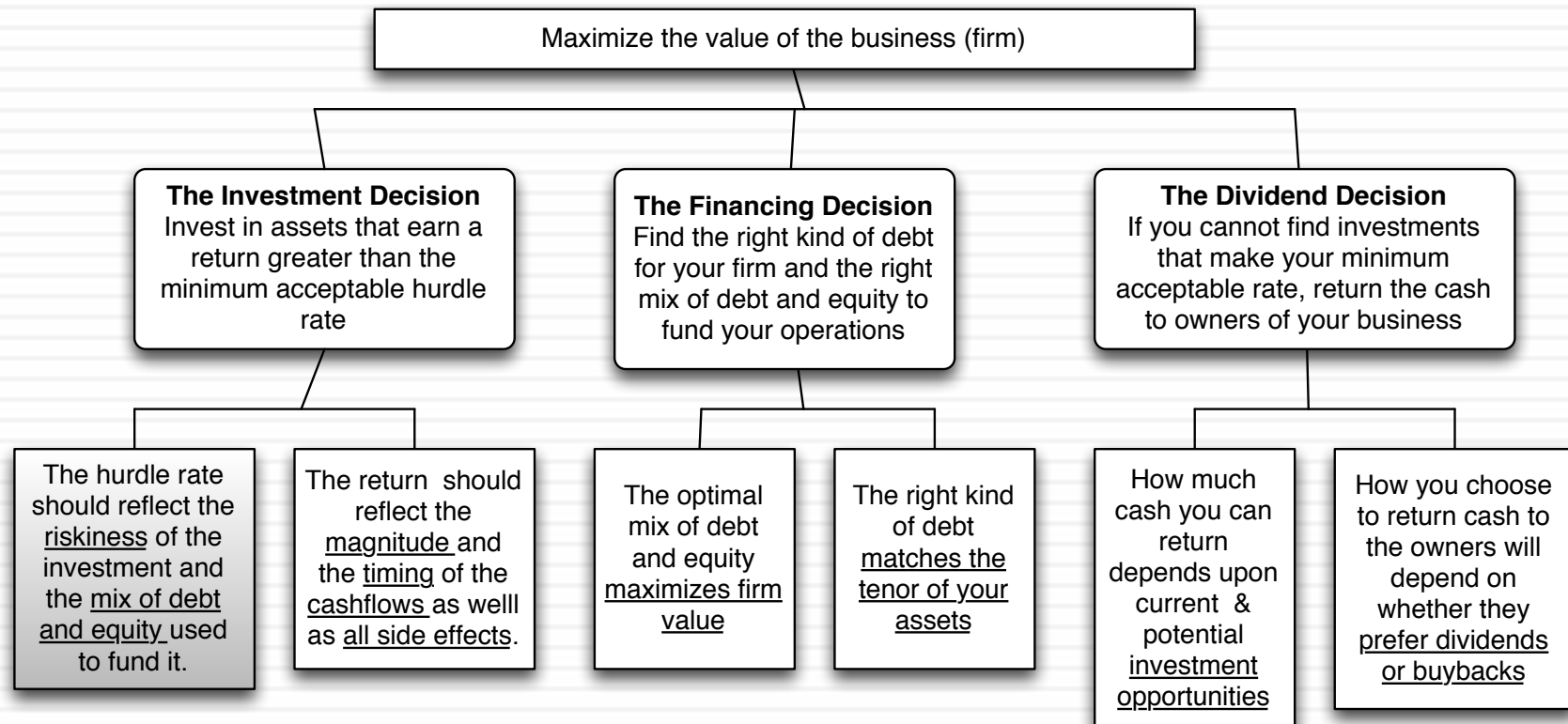


Aswath Damodaran

CORPORATE AND INVESTMENT HURDLE RATES: RISK AND RETURN MODELS

“You cannot swing upon a rope that is attached only to your own belt.”

First Principles



What is Risk?

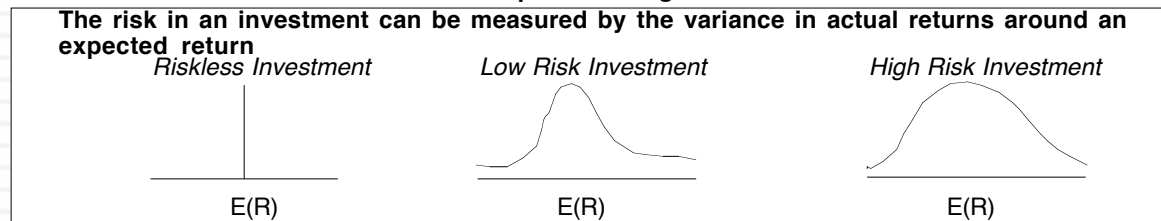
- Risk, in traditional terms, is viewed as a ‘negative’. Webster’s dictionary, for instance, defines risk as “exposing to danger or hazard”. The Chinese symbols for risk, reproduced below, give a much better description of risk:

危机

- The first symbol is the symbol for “danger”, while the second is the symbol for “opportunity”, making risk a mix of danger and opportunity. You cannot have one, without the other.
- Risk is therefore neither good nor bad. It is just a fact of life. The question that businesses have to address is therefore not whether to avoid risk but how best to incorporate it into their decision making.

The CAPM and its alternatives

Step 1: Defining Risk



Step 2: Differentiating between Rewarded and Unrewarded Risk

<p><i>Risk that is specific to investment (Firm Specific)</i> 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 The marginal investor is assumed to hold a “diversified” portfolio. Thus, only market risk will be rewarded and priced.</p>	<p><i>Risk that affects all investments (Market Risk)</i> Cannot be diversified away since most assets are affected by it.</p>
--	---

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 <u>market portfolio</u> 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)

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.

Gauging the marginal investor: Disney in 2013

DIS US Equity 25) Settings 99) Feedback Holdings: Current

Walt Disney Co/The CUSIP 25468710

1) Current 2) Historical 3) Matrix 4) Ownership 5) Transactions 6) Options

Search Name -- 21) Save 22) Delete 3) Saved Search 24) Refine Search

Text Search Holder Group All Holders 20) Export

Holder Name	Portfolio Name	Source	Opt	Amt Held	% Out	Latest Chg	File Dt
1. LAURENE POWELL JOBS TPU	n/a	PROXY	All Sources	130,844,544	7.32	0	01/07/13
2. BLACKROCK	n/a	ULT-AGG	All	93,837,994	5.25	-494,298	09/24/13
3. VANGUARD GROUP INC	n/a	ULT-AGG		80,163,479	4.49	1,183,628	06/30/13
4. STATE STREET CORP	n/a	ULT-AGG		77,799,514	4.35	2,893,171	09/24/13
5. CAPITAL GROUP COMPANIES	n/a	ULT-AGG		62,014,410	3.47	36,689,294	06/30/13
6. FMR LLC	n/a	ULT-AGG		59,453,225	3.33	-1,495,596	06/30/13
7. SUN LIFE FINANCIAL INC	n/a	ULT-AGG		55,699,112	3.12	-1,422,694	06/30/13
8. STATE FARM MUTUAL AUTO I	STATE FARM MUTUAL AU	13F		42,206,018	2.36	0	06/30/13
9. LUCAS JR GEORGE W	n/a	Co File		37,076,679	2.08	0	02/06/13
10. BANK OF NEW YORK MELLON	BANK OF NEW YORK MEL	13F		30,293,150	1.70	-127,337	06/30/13
11. NORTHERN TRUST CORPORAT	NORTHERN TRUST CORP	13F		28,465,082	1.59	224,418	06/30/13
12. T ROWE PRICE ASSOCIATES	T ROWE PRICE ASSOCIA	13F		25,834,722	1.45	-3,332,832	06/30/13
13. WELLINGTON MANAGEMENT CO	WELLINGTON MANAGEME	13F		24,292,691	1.36	-4,191,722	06/30/13
14. JENNISON ASSOCIATES LLC	JENNISON ASSOCIATES	13F		16,644,863	0.93	2,408,938	06/30/13
15. JP MORGAN	n/a	ULT-AGG		15,073,679	0.84	1,496,290	06/30/13
16. NORGES BANK	NORGES BANK	13F		14,991,213	0.84	0	12/31/12
17. DAVIS SELECTED ADVISERS L	DAVIS SELECTED ADVISE	13F		12,938,299	0.72	-2,546,616	06/30/13
18. GEODE CAPITAL MANAGEMEN	GEODE CAPITAL MANAGE	13F		12,441,353	0.70	233,702	06/30/13

Loading % Out 79.75 Zoom 100%

Inputs required to use the CAPM -

- The capital asset pricing model yields the following expected return:
 - $\text{Expected Return} = \text{Riskfree Rate} + \text{Beta} * (\text{Expected Return on the Market Portfolio} - \text{Riskfree Rate})$
- 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.

I. The government bond rate is not always the risk free rate

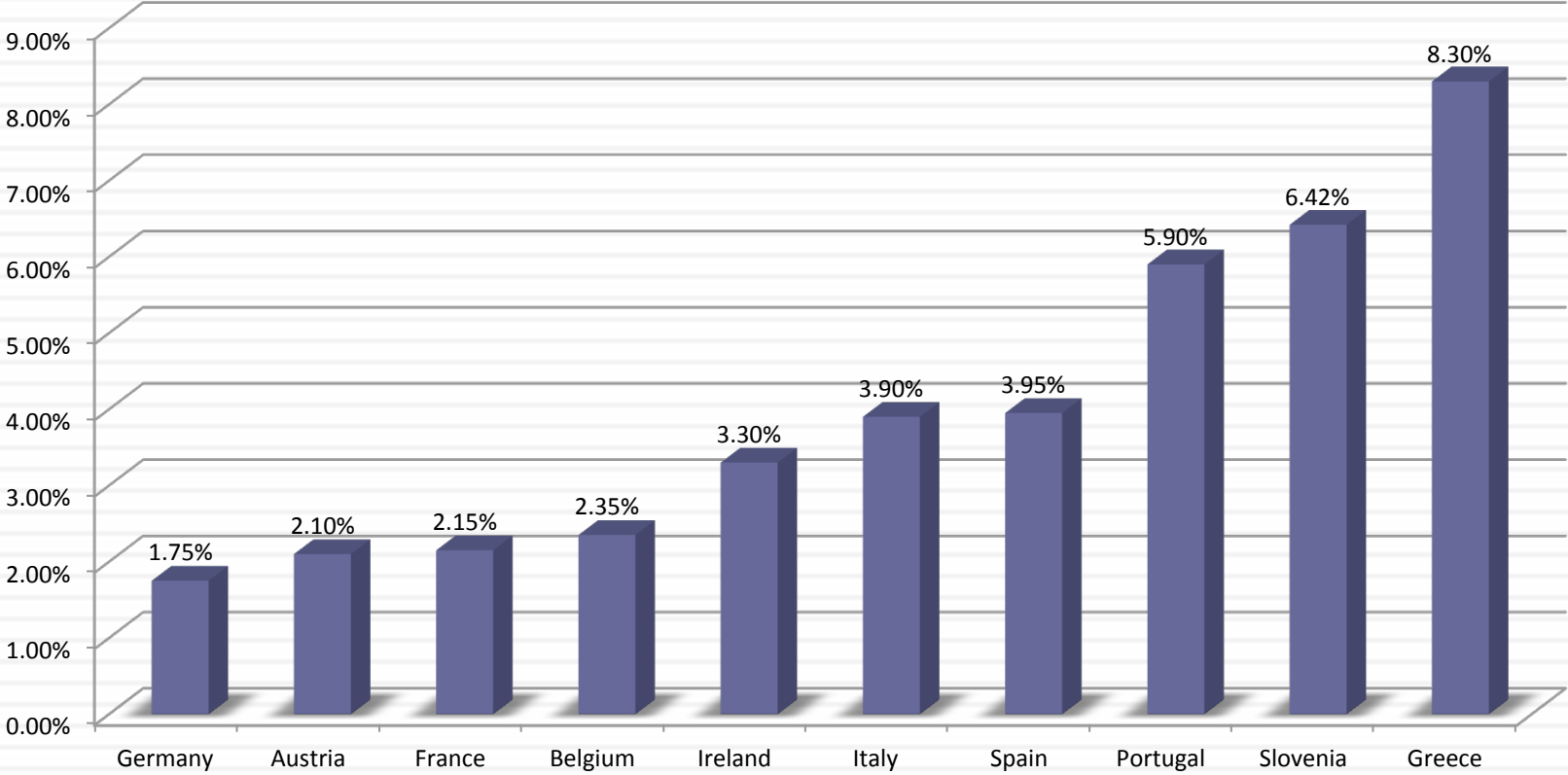
- On a riskfree asset, the actual return is equal to the expected return. Therefore, there is no variance around the expected return.
- For an investment to be riskfree, i.e., to have an actual return be equal to the expected return, two conditions have to be met –
 - There has to be no default risk,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

Proposition 1: Since investment analysis and valuation are almost always done over the long term, the risk free rate in corporate finance has to be a long term rate.

Proposition 2: Only government bonds can be risk free, but not all government bonds are risk free.

Getting a Euro risk free rate

Rate on 10-year Euro Government Bonds: January 2014



What if there is no default-free entity?

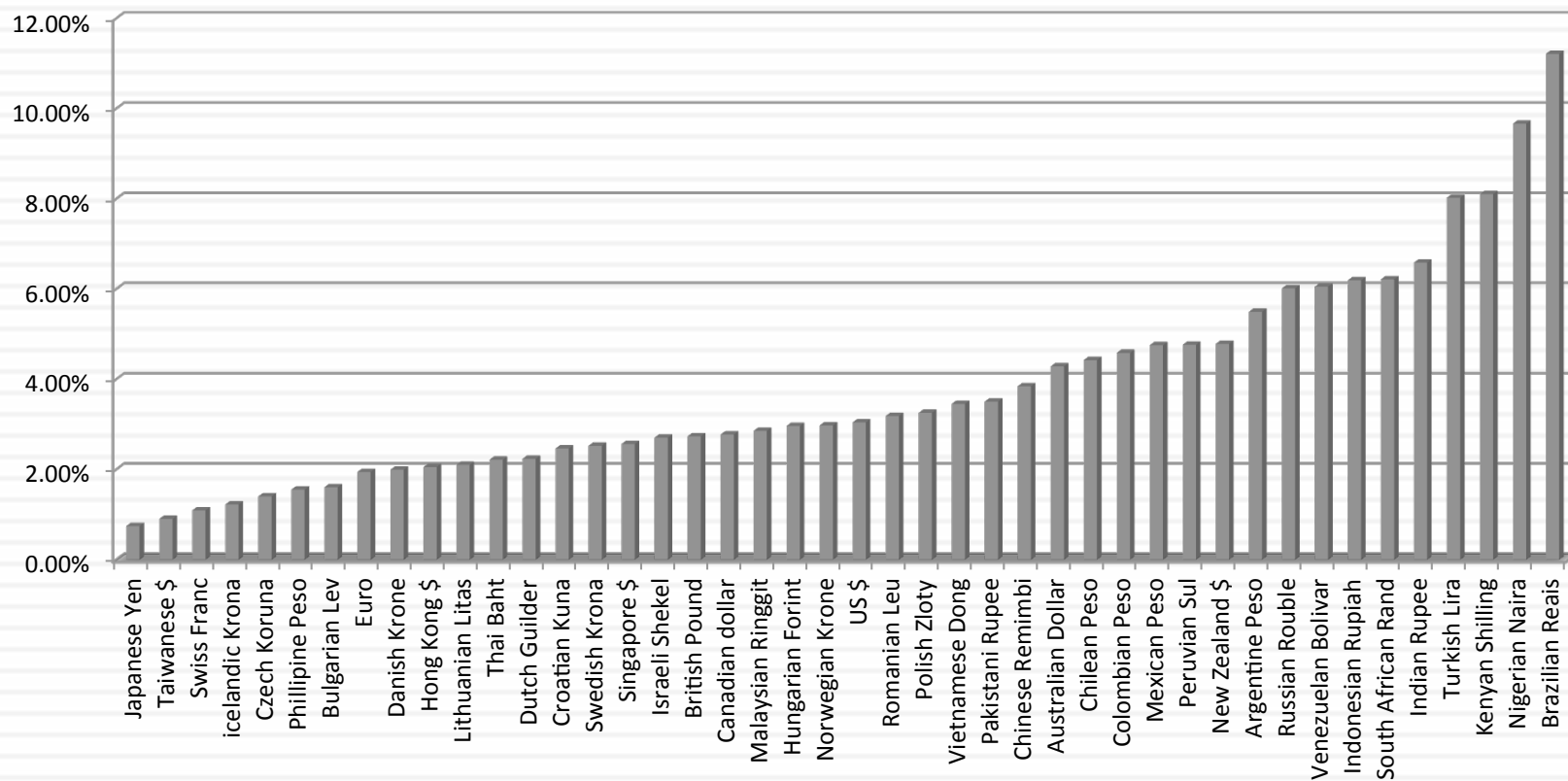
Estimating a risk free rate

PB Page 14-21

- If the government is perceived to have default risk, the government bond rate will have a default spread component in it and not be riskfree. There are three choices we have, when this is the case.
 - Adjust the local currency government borrowing rate for default risk to get a riskless local currency rate.
 - In May 2014, the Russian Government Bond rate in rubles = 8.82%
 - The Russian local currency rating was Baa1, with a default spread of 1.6%. However, the sovereign CDS spread for Russia in May 2014 was 2.45%.
Riskfree rate in Russian Rubles = $8.82\% - 2.45\% = 6.37\%$
 - Do the analysis in an alternate currency, where getting the riskfree rate is easier. With Yandex in 2014, we could chose to do the analysis in US dollars (rather than estimate a riskfree rate in Russian Rubles). The riskfree rate is then the US treasury bond rate.
 - Do your analysis in real terms, in which case the riskfree rate has to be a real riskfree rate. The inflation-indexed treasury rate is a measure of a real riskfree rate.

Risk free rates will vary across currencies!

Risk free rate by Currency: January 2014



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

A. The Historical Risk Premium United States – January 2014

	Arithmetic Average		Geometric Average	
	Stocks - T. Bills	Stocks - T. Bonds	Stocks - T. Bills	Stocks - T. Bonds
1928-2013	7.93%	6.29%	6.02%	4.62%
Std Error	2.19%	2.34%		
1964-2013	6.18%	4.32%	4.83%	3.33%
Std Error	2.42%	2.75%		
2004-2013	7.55%	4.41%	5.80%	3.07%
Std Error	6.02%	8.66%		

□ What is the right premium?

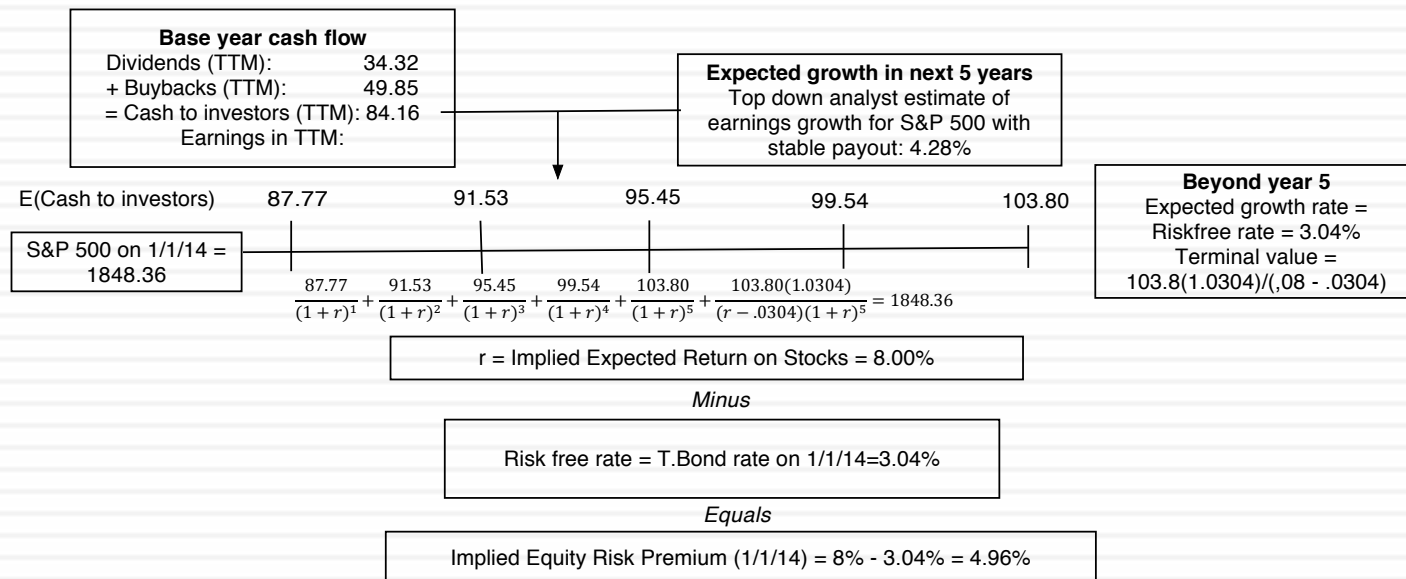
1. Go back as far as you can. Otherwise, the standard error in the estimate will be large.

$$\text{Std Error in estimate} = \frac{\text{Annualized Std deviation in Stock prices}}{\sqrt{\text{Number of years of historical data}}}$$

2. Be consistent in your use of a riskfree rate.
3. Use arithmetic premiums for one-year estimates of costs of equity and geometric premiums for estimates of long term costs of equity.

B. Implied ERP in January 2014: Watch what I pay, not what I say..

- If you can observe what investors are willing to pay for stocks, you can back out an expected return from that price and an implied equity risk premium.



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 data problem and there is much greater error associated with the estimates of the premiums.
- Put simply, if you distrust historical risk premiums in the United States, because the estimates are backward looking and noisy, you will trust them even less outside the US, where you have less data.

A Composite way of estimating ERP for countries

Step 1: Estimate an equity risk premium for a mature market. If your preference is for a forward looking, updated number, you can estimate an implied equity risk premium for the US (assuming that you buy into the contention that it is a mature market)

- My estimate: In January 2014, my estimate for the implied premium in the US was 5%. That will also be my estimate for a mature market ERP.

Step 2: Come up with a generic and measurable definition of a mature market.

- My estimate: Any AAA rated country is mature.

Step 3: Estimate the additional risk premium that you will charge for markets that are not mature. You have two choices:

- The default spread for the country, estimated based either on sovereign ratings or the CDS market.
- A scaled up default spread, where you adjust the default spread upwards for the additional risk in equity markets.

One solution: Estimating an additional country risk premium

- Emerging markets offer growth opportunities but they are also riskier. If we want to count the growth, we have to also consider the risk.
- Two ways of estimating the country risk premium:
 - Sovereign Default Spread: In this approach, the country equity risk premium is set equal to the default spread of the bond issued by the country.
 - Equity Risk Premium for mature market = 5.00%
 - Default spread for Russia
 - Based on sovereign rating of Baa1 (Moody's), default spread = 1.60%
 - Based on CDS spread in May 2014 = 2.45%
 - Equity Risk Premium for Russia = 5.00% + 2.45% = 7.45%
 - Adjusted for equity risk: The country equity risk premium is based upon the volatility of the equity market relative to the government bond/CDS.
 - Country risk premium = $\text{Default Spread} \times \frac{\text{Std Deviation}_{\text{Country Equity}}}{\text{Std Deviation}_{\text{Country CDS}}}$
 - Standard Deviation in Micex = 20.33%
 - Standard Deviation in Russian CDS = 13.12%
 - Russian Sovereign CDS = 2.45%
 - Additional country risk premium for Russia = $2.45\% \times (20.33\% / 13.12\%) = 3.80\%$
 - Equity risk premium for Russia = 5% + 3.80% = 8.80%

ERP : Jan 2014

Andorra	6.80%	1.80%	Liechtenstein	5.00%	0.00%
Austria	5.00%	0.00%	Luxembourg	5.00%	0.00%
Belgium	5.90%	0.90%	Malta	6.80%	1.80%
Cyprus	20.00%	15.00%	Netherlands	5.00%	0.00%
Denmark	5.00%	0.00%	Norway	5.00%	0.00%
Finland	5.00%	0.00%	Portugal	10.40%	5.40%
France	5.60%	0.60%	Spain	8.30%	3.30%
Germany	5.00%	0.00%	Sweden	5.00%	0.00%
Greece	20.00%	15.00%	Switzerland	5.00%	0.00%
Iceland	8.30%	3.30%	Turkey	8.30%	3.30%
Ireland	8.75%	3.75%	United Kingdom	5.60%	0.60%
Italy	7.85%	2.85%	Western Europe	6.29%	1.29%

Canada	5.00%	0.00%
United States of America	5.00%	0.00%
North America	5.00%	0.00%

Argentina	14.75%	9.75%
Belize	18.50%	13.50%
Bolivia	10.40%	5.40%
Brazil	7.85%	2.85%
Chile	5.90%	0.90%
Colombia	8.30%	3.30%
Costa Rica	8.30%	3.30%
Ecuador	16.25%	11.25%
El Salvador	10.40%	5.40%
Guatemala	8.75%	3.75%
Honduras	13.25%	8.25%
Mexico	7.40%	2.40%
Nicaragua	14.75%	9.75%
Panama	7.85%	2.85%
Paraguay	10.40%	5.40%
Peru	7.85%	2.85%
Suriname	10.40%	5.40%
Uruguay	8.30%	3.30%
Venezuela	16.25%	11.25%
Latin America	8.62%	3.62%

Angola	10.40%	5.40%
Benin	13.25%	8.25%
Botswana	6.28%	1.28%
Burkina Faso	13.25%	8.25%
Cameroon	13.25%	8.25%
Cape Verde	13.25%	8.25%
DR Congo	14.75%	9.75%
Egypt	16.25%	11.25%
Gabon	10.40%	5.40%
Ghana	11.75%	6.75%
Kenya	11.75%	6.75%
Morocco	8.75%	3.75%
Mozambique	11.75%	6.75%
Namibia	8.30%	3.30%
Nigeria	10.40%	5.40%
Rep Congo	10.40%	5.40%
Rwanda	13.25%	8.25%
Senegal	11.75%	6.75%
South Africa	7.40%	2.40%
Tunisia	10.40%	5.40%
Uganda	11.75%	6.75%
Zambia	11.75%	6.75%
Africa	10.04%	5.04%

Albania	11.75%	6.75%
Armenia	9.50%	4.50%
Azerbaijan	8.30%	3.30%
Belarus	14.75%	9.75%
Bosnia and Herzegovina	14.75%	9.75%
Bulgaria	7.85%	2.85%
Croatia	8.75%	3.75%
Czech Republic	6.05%	1.05%
Estonia	6.05%	1.05%
Georgia	10.40%	5.40%
Hungary	8.75%	3.75%
Kazakhstan	7.85%	2.85%
Latvia	7.85%	2.85%
Lithuania	7.40%	2.40%
Macedonia	10.40%	5.40%
Moldova	14.75%	9.75%
Montenegro	10.40%	5.40%
Poland	6.28%	1.28%
Romania	8.30%	3.30%
Russia	7.40%	2.40%
Serbia	11.75%	6.75%
Slovakia	6.28%	1.28%
Slovenia	8.75%	3.75%
Ukraine	16.25%	11.25%
E. Europe & Russia	7.96%	2.96%

Abu Dhabi	5.75%	0.75%
Bahrain	7.85%	2.85%
Israel	6.05%	1.05%
Jordan	11.75%	6.75%
Kuwait	5.75%	0.75%
Lebanon	11.75%	6.75%
Oman	6.05%	1.05%
Qatar	5.75%	0.75%
Saudi Arabia	5.90%	0.90%
United Arab Emirates	5.75%	0.75%
Middle East	6.14%	1.14%

Bangladesh	10.40%	5.40%
Cambodia	13.25%	8.25%
China	5.90%	0.90%
Fiji	11.75%	6.75%
Hong Kong	5.60%	0.60%
India	8.30%	3.30%
Indonesia	8.30%	3.30%
Japan	5.90%	0.90%
Korea	5.90%	0.90%
Macao	5.90%	0.90%
Malaysia	6.80%	1.80%
Mauritius	7.40%	2.40%
Mongolia	11.75%	6.75%
Pakistan	16.25%	11.25%
Papua New Guinea	11.75%	6.75%
Philippines	8.30%	3.30%
Singapore	5.00%	0.00%
Sri Lanka	11.75%	6.75%
Taiwan	5.90%	0.90%
Thailand	7.40%	2.40%
Vietnam	13.25%	8.25%
Asia	6.51%	1.51%

Australia	5.00%	0.00%
Cook Islands	11.75%	6.75%
New Zealand	5.00%	0.00%
Australia & New Zealand	5.00%	0.00%

Black #: Total ERP
 Red #: Country risk premium
 AVG: GDP weighted average

Estimating ERP for Disney: November 2013

- Incorporation: The conventional practice on equity risk premiums is to estimate an ERP based upon where a company is incorporated. Thus, the cost of equity for Disney would be computed based on the US equity risk premium, because it is a US company, and the Brazilian ERP would be used for Vale, because it is a Brazilian company.
- Operations: The more sensible practice on equity risk premium is to estimate an ERP based upon where a company operates. For Disney in 2013:

<i>Region/ Country</i>	<i>Proportion of Disney's Revenues</i>	<i>ERP</i>
US& Canada	82.01%	5.50%
Europe	11.64%	6.72%
Asia-Pacific	6.02%	7.27%
Latin America	0.33%	9.44%
Disney	100.00%	5.76%

ERP for Yandex

- Until 2012, Yandex derived all of its revenues from Russia, and the equity risk premium for Russia would have been the ERP for Yandex as well.
- In 2013, Yandex derived 2.7 billion rubles (about 6.8% of total) in revenues from outside Russia. The ERP that we will derive for the company is as follows:

<i>Region</i>	<i>Revenues (billions Rbls)</i>	<i>% of revenues</i>	<i>ERP</i>
Russia	36.8	93.16%	8.80%
Ukraine & Belarus	2.7	6.84%	15.50%
Yandex	39.5	100.00%	9.26%

Aswath Damodaran

Estimating Beta

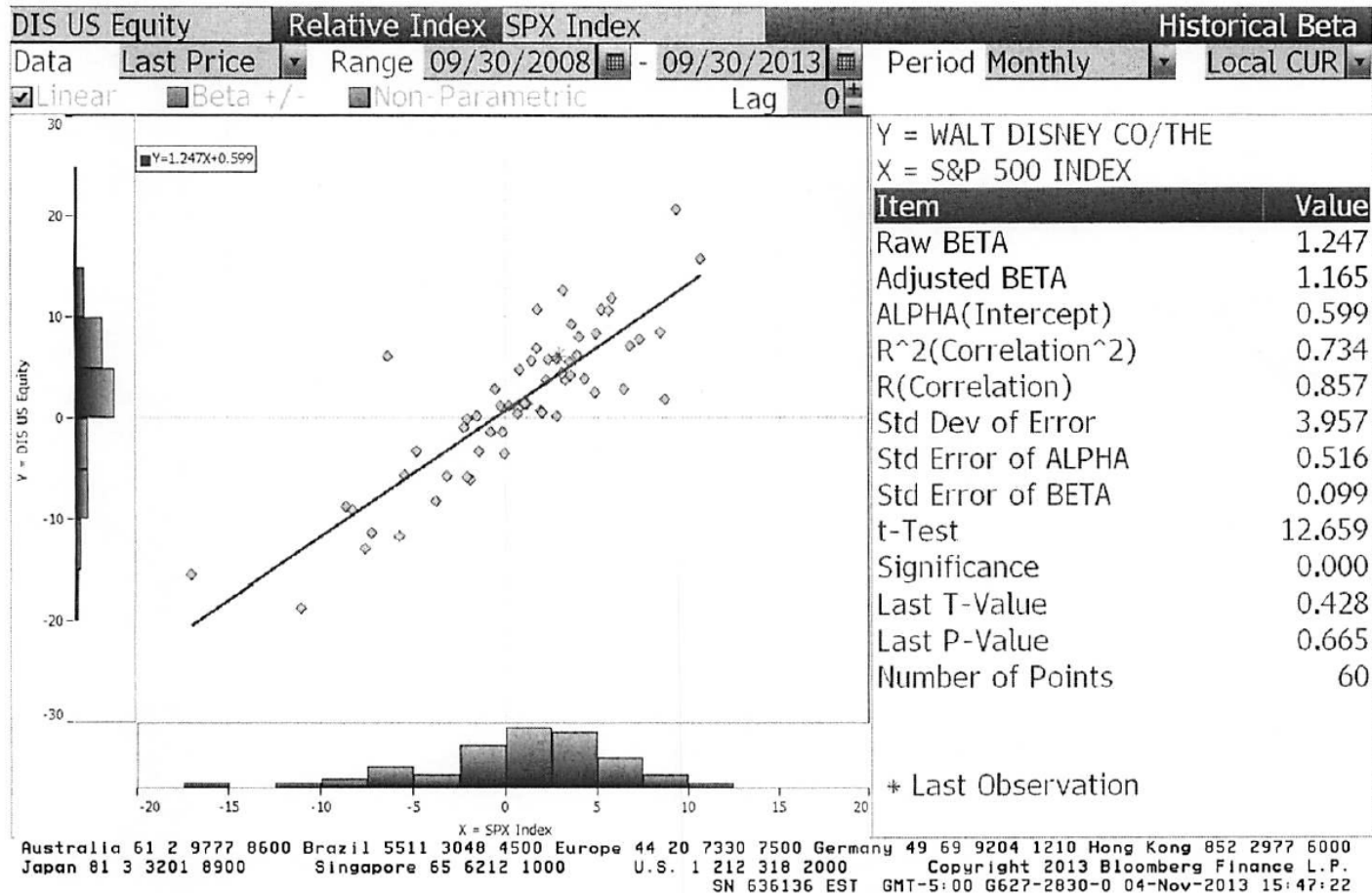
- The standard procedure for estimating betas is to regress stock returns (R_j) against market returns (R_m) -

$$R_j = a + b R_m$$

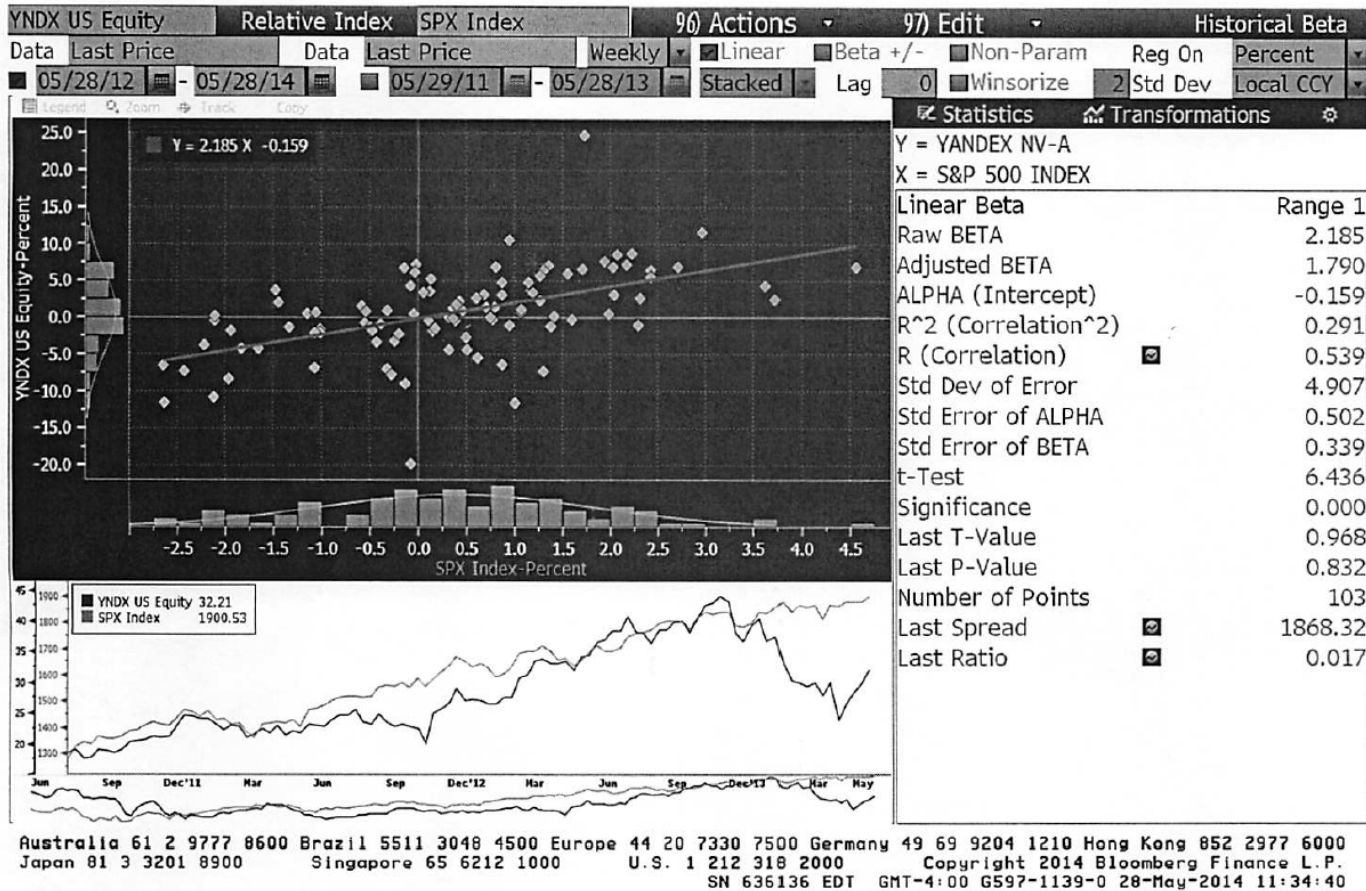
where a is the intercept and b is the slope of the regression.

- The slope of the regression corresponds to the beta of the stock, and measures the riskiness of the stock.
- 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.

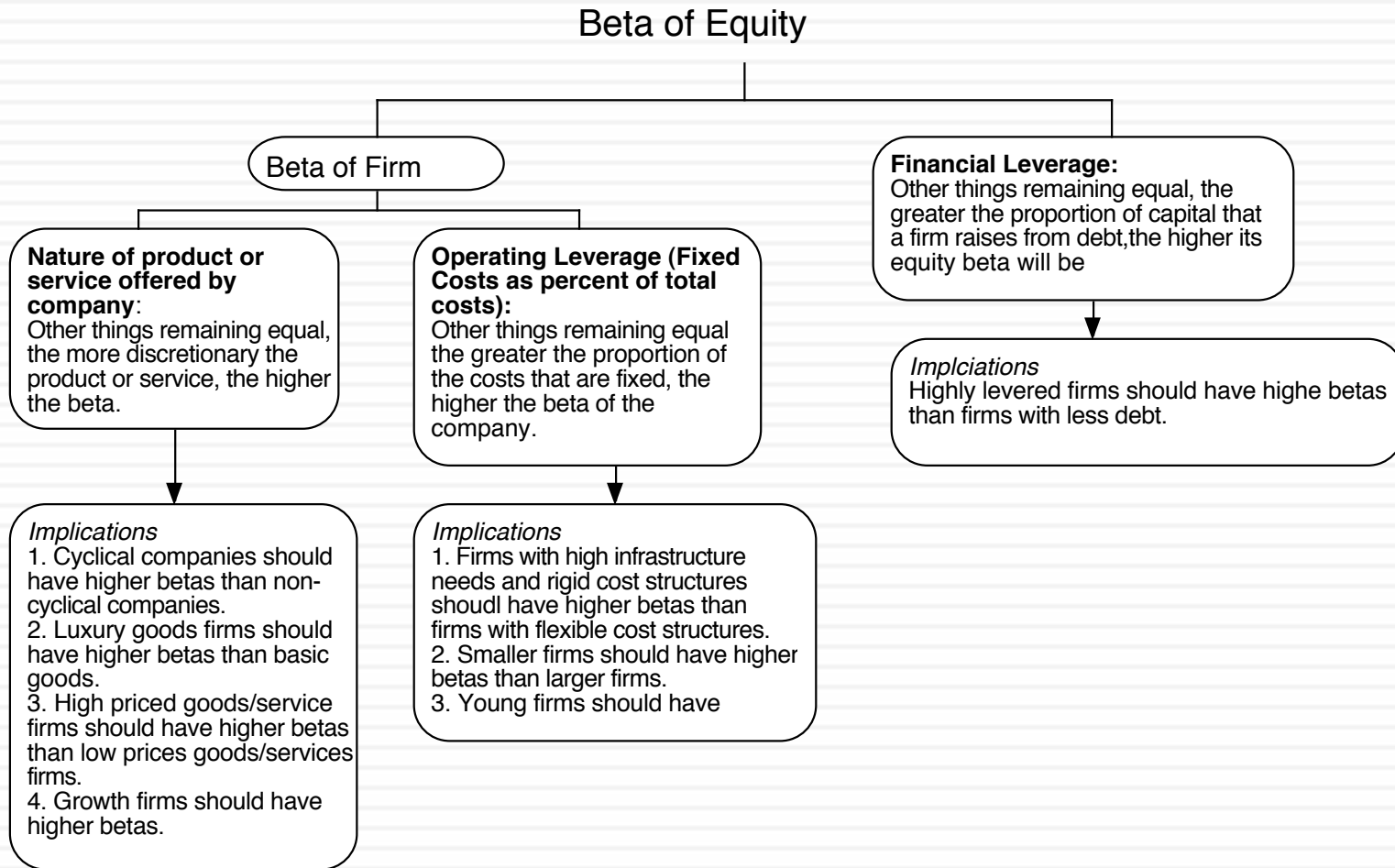
Disney's Beta: A regression – November 2013



Yandex: Beta estimate in May 2014



Determinants of Betas



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 is a better estimate than the top down beta for the following reasons
 - ▣ The standard error of the beta estimate will be much lower
 - ▣ The betas can reflect the current (and even expected future) mix of businesses that the firm is in rather than the historical mix

Disney's businesses: The financial breakdown (from 2013 annual report)

<i>Business</i>	<i>Revenues</i>	<i>Operating Income</i>	<i>D&A</i>	<i>EBITDA</i>	<i>S, G & A Costs</i>	<i>Cap Ex</i>	<i>Identifiable Assets</i>
Media Networks	\$20,356	\$6,818	\$251	\$7,069	\$2,768	\$263	\$28,627
Parks & Resorts	\$14,087	\$2,220	\$1,370	\$3,590	\$1,960	\$2,110	\$22,056
Studio Entertainment	\$5,979	\$661	\$161	\$822	\$2,145	\$78	\$14,750
Consumer Products	\$3,555	\$1,112	\$146	\$1,258	\$731	\$45	\$7,506
Interactive	\$1,064	-\$87	\$44	-\$43	\$449	\$13	\$2,311

Unlevered Betas for businesses

Unlevered Beta
 $(1 - \text{Cash}/ \text{Firm Value})$

<i>Business</i>	<i>Comparable firms</i>	<i>Sample size</i>	<i>Median Beta</i>	<i>Median D/E</i>	<i>Median Tax rate</i>	<i>Company Unlevered Beta</i>	<i>Median Cash/ Firm Value</i>	<i>Business Unlevered Beta</i>
Media Networks	US firms in broadcasting business	26	1.43	71.09%	40.00%	1.0024	2.80%	1.0313
Parks & Resorts	Global firms in amusement park business	20	0.87	46.76%	35.67%	0.6677	4.95%	0.7024
Studio Entertainment	US movie firms	10	1.24	27.06%	40.00%	1.0668	2.96%	1.0993
Consumer Products	Global firms in toys/games production & retail	44	0.74	29.53%	25.00%	0.6034	10.64%	0.6752
Interactive	Global computer gaming firms	33	1.03	3.26%	34.55%	1.0085	17.25%	1.2187

Disney's unlevered beta: Operations & Entire Company

<i>Business</i>	<i>Revenues</i>	<i>EV/Sales</i>	<i>Value of Business</i>	<i>Proportion of Disney</i>	<i>Unlevered beta</i>	<i>Value</i>	<i>Proportion</i>
Media Networks	\$20,356	3.27	\$66,580	49.27%	1.03	\$66,579.81	49.27%
Parks & Resorts	\$14,087	3.24	\$45,683	33.81%	0.70	\$45,682.80	33.81%
Studio Entertainment	\$5,979	3.05	\$18,234	13.49%	1.10	\$18,234.27	13.49%
Consumer Products	\$3,555	0.83	\$2,952	2.18%	0.68	\$2,951.50	2.18%
Interactive	\$1,064	1.58	\$1,684	1.25%	1.22	\$1,683.72	1.25%
Disney Operations	\$45,041		\$135,132	100.00%	0.9239	\$135,132.11	

Disney has \$3.93 billion in cash, invested in close to riskless assets (with a beta of zero). You can compute an unlevered beta for Disney as a company (inclusive of cash):

$$\beta_{\text{Disney}} = \beta_{\text{Operating Assets}} \frac{\text{Value}_{\text{Operating Assets}}}{(\text{Value}_{\text{Operating Assets}} + \text{Value}_{\text{Cash}})} + \beta_{\text{Cash}} \frac{\text{Value}_{\text{Cash}}}{(\text{Value}_{\text{Operating Assets}} + \text{Value}_{\text{Cash}})}$$

$$= 0.9239 \left(\frac{135,132}{(135,132 + 3,931)} \right) + 0.00 \left(\frac{3,931}{(135,132 + 3,931)} \right) = 0.8978$$

The levered beta: Disney and its divisions

- To estimate the debt ratios for division, we allocate Disney's total debt (\$15,961 million) to its divisions based on identifiable assets.

<i>Business</i>	<i>Identifiable assets (2013)</i>	<i>Proportion of debt</i>	<i>Value of business</i>	<i>Allocated debt</i>	<i>Estimated equity</i>	<i>D/E ratio</i>
Media Networks	\$28,627	38.04%	\$66,580	\$6,072	\$60,508	10.03%
Parks & Resorts	\$22,056	29.31%	\$45,683	\$4,678	\$41,005	11.41%
Studio Entertainment	\$14,750	19.60%	\$18,234	\$3,129	\$15,106	20.71%
Consumer Products	\$7,506	9.97%	\$2,952	\$1,592	\$1,359	117.11%
Interactive	\$2,311	3.07%	\$1,684	\$490	\$1,194	41.07%
Disney	\$75,250	100.00%		\$15,961	\$121,878	13.10%

- We use the allocated debt to compute D/E ratios and levered betas.

<i>Business</i>	<i>Unlevered beta</i>	<i>Value of business</i>	<i>D/E ratio</i>	<i>Levered beta</i>	<i>Cost of Equity</i>
Media Networks	1.0313	\$66,580	10.03%	1.0975	9.07%
Parks & Resorts	0.7024	\$45,683	11.41%	0.7537	7.09%
Studio Entertainment	1.0993	\$18,234	20.71%	1.2448	9.92%
Consumer Products	0.6752	\$2,952	117.11%	1.1805	9.55%
Interactive	1.2187	\$1,684	41.07%	1.5385	11.61%
Disney Operations	0.9239	\$135,132	13.10%	1.0012	8.52%

A far simpler task: Estimating a bottom up beta and cost of equity for Yandex

- Yandex is in only one business, online advertising. The average unlevered beta for online advertising companies in May 2014 is 1.13.
- Yandex has a market debt to equity ratio of 8.60% and the marginal tax rate in Russia is 20%. The resulting levered beta for Yandex (and its single business) is 1.21.
 - Levered beta for Yandex = $1.13 (1 + (1 - .20) (.086)) = 1.21$

<i>Region</i>	<i>Risk free rate</i>	<i>ERP</i>	<i>Beta</i>	<i>Cost of equity</i>
Russia	6.37%	0.0880	1.2078	17.00%
Ukraine & Belarus	6.37%	0.1550	1.2078	25.09%
Yandex	6.37%	0.0926	1.2078	17.55%

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.

A more general route: Estimating Synthetic Ratings

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

$$\text{Interest Coverage Ratio} = \text{EBIT} / \text{Interest Expenses}$$

- For Yandex, we obtain an interest coverage ratio of 8.52 by dividing operating income in the last twelve months by interest expenses:

- ▣ Interest coverage ratio = $13884/1630 = 8.52$

Interest Coverage Ratios, Ratings and Default Spreads

<i>Large cap (>\$5 billion)</i>	<i>Small cap or risky (<\$5 billion)</i>	<i>Rating is (S&P/ Moody's)</i>	<i>Spread (11/13)</i>
>8.50	>12.5	Aaa/AAA	0.40%
6.5-8.5	9.5-12.5	Aa2/AA	0.70%
5.5-6.5	7.5-9.5	A1/A+	0.85%
4.25-5.5	6-7.5	A2/A	1.00%
3-4.25	4.5-6	A3/A-	1.30%
2.5-3	4-4.5	Baa2/BBB	2.00%
2.25-2.5	3.5-4	Ba1/BB+	3.00%
2-2.25	3-3.5	Ba2/BB	4.00%
1.75-2.25	2.5-3	B1/B+	5.50%
1.5-1.75	2-2.5	B2/B	6.50%
1.25-1.5	1.5-2	B3/B-	7.25%
0.8-1.25	1.25-1.5	Caa/CCC	8.75%
0.65-0.8	0.8-1.25	Ca2/CC	9.50%
0.2-0.65	0.5-0.8	C2/C	10.50%
<0.2	<0.5	D2/D	12.00%

Disney: Large cap, developed 22.57 → AAA
 Yandex: Small cap, risky 8.52 -> A1/A+

From ratings to cost of debt

- For Disney, which is rated A in November 2013, this yields a US dollar cost of debt of 3.75%:

Disney cost of debt

= US \$ Risk free rate + Default spread (based on A rating)

= 2.75% + 1.00% = 3.75%

Disney after-tax cost of debt = 3.75% (1-.361) = 2.40%

- For Yandex, there is no bond rating.
 - ▣ Synthetic rating = A1
 - ▣ Default spread for synthetic rating = 0.85%
 - ▣ Default spread for country (Russia) = 2.45%
 - ▣ Yandex pre-tax cost of debt = 6.37% + 2.45% + 0.85% = 9.67%
 - ▣ Yandex after-tax cost of debt = 9.67% (1-.20) = 7.74%

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.
- In practical terms, estimating the market value of equity should be easy for a publicly traded firm, but some or all of the debt at most companies is not traded. As a consequence, most practitioners use the book value of debt as a proxy for the market value of debt.

Disney: From book value to market value for interest bearing debt...

- In Disney's 2013 financial statements, the debt due over time was footnoted.

Time due	Amount due	Weight	Weight *Maturity
0.5	\$1,452	11.96%	0.06
2	\$1,300	10.71%	0.21
3	\$1,500	12.36%	0.37
4	\$2,650	21.83%	0.87
6	\$500	4.12%	0.25
8	\$1,362	11.22%	0.9
9	\$1,400	11.53%	1.04
19	\$500	4.12%	0.78
26	\$25	0.21%	0.05
28	\$950	7.83%	2.19
29	\$500	4.12%	1.19
	\$12,139		7.92

- Disney's total debt due, in book value terms, on the balance sheet is \$14,288 million and the total interest expense for the year was \$349 million. Using 3.75% as the pre-tax cost of debt:

- Estimated MV of Disney Debt =
$$349 \left[\frac{1 - \frac{1}{(1.0375)^{7.92}}}{0.0375} \right] + \frac{14,288}{(1.0375)^{7.92}} = \$13,028 \text{ million}$$

Operating Leases at Disney

- The “debt value” of operating leases is the present value of the lease payments, at a rate that reflects their risk, usually the pre-tax cost of debt.
- The pre-tax cost of debt at Disney is 3.75%.

Year	Commitment	Present Value @3.75%
1	\$507.00	\$488.67
2	\$422.00	\$392.05
3	\$342.00	\$306.24
4	\$272.00	\$234.76
5	\$217.00	\$180.52
6-10	\$356.80	\$1,330.69
Debt value of leases		\$2,932.93

Disney reported \$1,784 million in commitments after year 5. Given that their average commitment over the first 5 years, we assumed 5 years @ \$356.8 million each.

- Debt outstanding at Disney = \$13,028 + \$ 2,933= \$15,961 million

Current Cost of Capital: Disney

□ Equity

- Cost of Equity = Riskfree rate + Beta * Risk Premium
= 2.75% + 1.0013 (5.76%) = 8.52%

- Market Value of Equity = \$121,878 million

- Equity/(Debt+Equity) = 88.42%

□ Debt

- After-tax Cost of debt = (Riskfree rate + Default Spread) (1-t)
= (2.75%+1%) (1-.361) = 2.40%

- Market Value of Debt = \$13,028+ \$2933 = \$ 15,961 million

- Debt/(Debt +Equity) = 11.58%

- Cost of Capital = 8.52%(.8842)+ 2.40%(.1158) = 7.81%

Debt and Operating Leases at Yandex

- Conventional Debt outstanding = 20,783 million Rubles
- Lease commitments

Year	Commitment	Present Value
1	RUB 3,021.00	RUB 2,754.63
2	RUB 2,101.00	RUB 1,746.83
3	RUB 1,901.00	RUB 1,441.18
4	RUB 2,197.00	RUB 1,518.72
5	RUB 3,556.00	RUB 2,241.42
6 and beyond	RUB 0.00	RUB 0.00
Debt Value of leases =		RUB 9,702.78

- Total Debt outstanding = 20,783 + 9,702 = 30,486 million Rubles
- Market value of equity = 354,409 million Rubles
- Debt to capital ratio = $30,486 / (354,409 + 30,486) = 7.92\%$

Divisional Costs of Capital: Disney and Yandex Cost of Capital

Disney

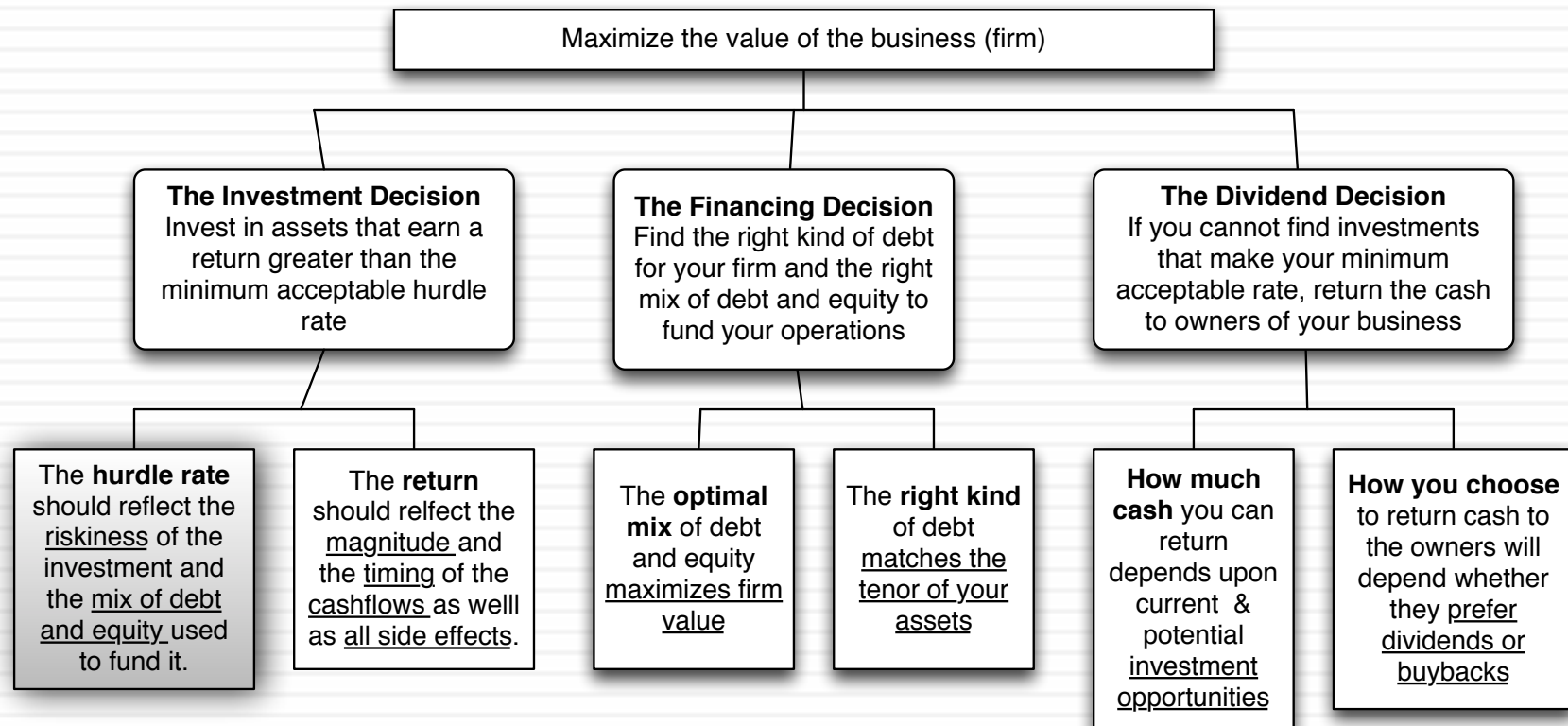
	Cost of equity	Cost of debt	Marginal tax rate	After-tax cost of debt	Debt ratio	Cost of capital
Media Networks	9.07%	3.75%	36.10%	2.40%	9.12%	8.46%
Parks & Resorts	7.09%	3.75%	36.10%	2.40%	10.24%	6.61%
Studio Entertainment	9.92%	3.75%	36.10%	2.40%	17.16%	8.63%
Consumer Products	9.55%	3.75%	36.10%	2.40%	53.94%	5.69%
Interactive	11.65%	3.75%	36.10%	2.40%	29.11%	8.96%
Disney Operations	8.52%	3.75%	36.10%	2.40%	11.58%	7.81%

Yandex

<i>Region</i>	<i>Cost of equity</i>	<i>After-tax cost of debt</i>	<i>Debt to capital ratio</i>	<i>Cost of capital</i>
Russia	17.00%	7.74%	7.92%	16.27%
Ukraine & Belarus	25.09%	7.74%	7.92%	23.72%
Yandex	17.55%	7.74%	7.92%	16.77%

Aswath Damodaran

Back to First Principles





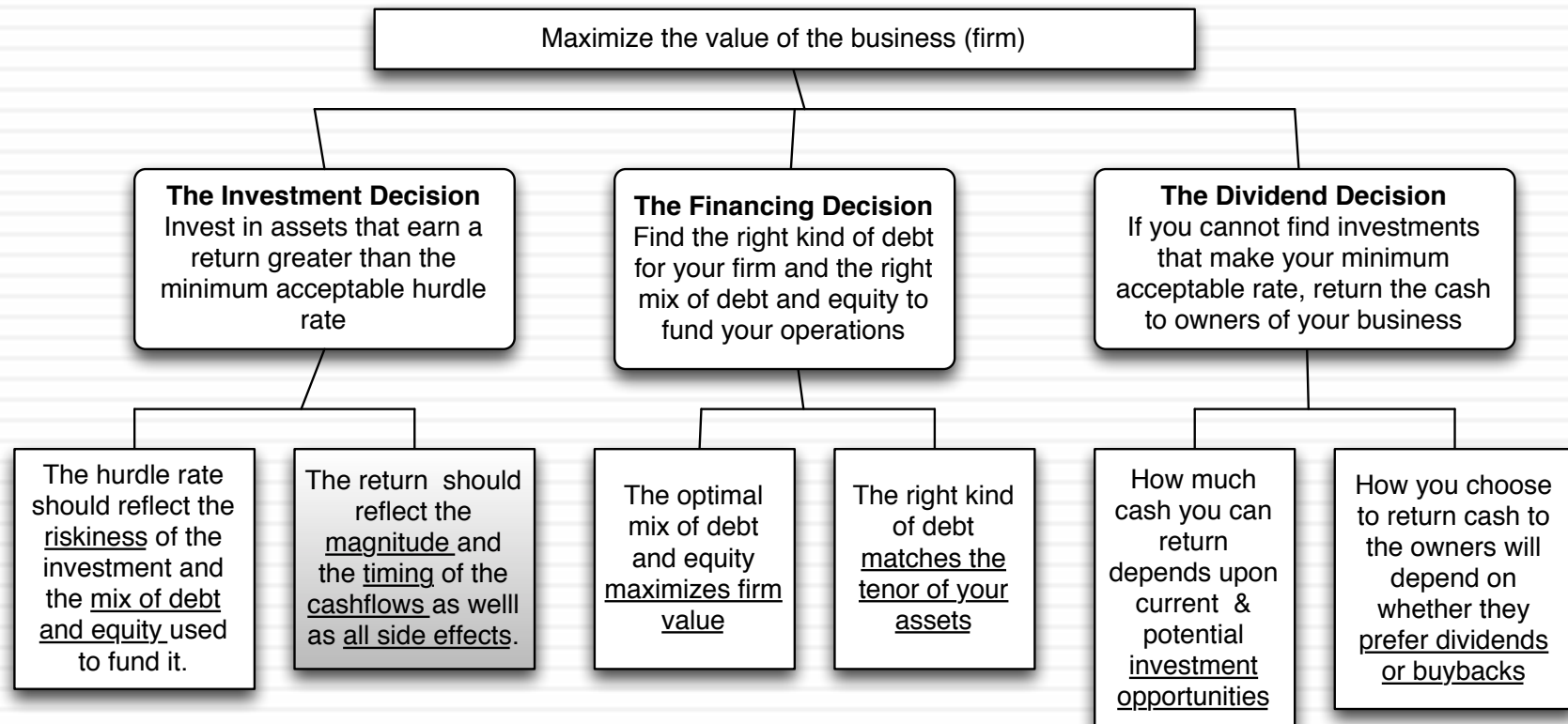
Aswath Damodaran

MEASURING INVESTMENT RETURNS

“Show me the money”

from Jerry Maguire

First Principles



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 Rio, modeled on Euro Disney in Paris and Disney World in Orlando.
- The complex 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 fourth year.
- The earnings and cash flows are estimated in nominal U.S. Dollars.

Key Assumptions on Start Up and Construction

- Disney has already spent \$0.5 Billion researching the proposal and getting the necessary licenses for the park; none of this investment can be recovered if the park is not built. This expenditure has been capitalized and will be depreciated straight line over ten years to a salvage value of zero.
- Disney will face substantial construction costs, if it chooses to build the theme parks.
 - The cost of constructing Magic Kingdom will be \$3 billion, with \$ 2 billion to be spent right now, and \$1 Billion to be spent one year from now.
 - The cost of constructing Epcot II will be \$ 1.5 billion, with \$ 1 billion to be spent at the end of the second year and \$0.5 billion at the end of the third year.
 - These investments will be depreciated based upon a depreciation schedule in the tax code, where depreciation will be different each year.

Step 1: Estimate Accounting Earnings on Project

	0	1	2	3	4	5	6	7	8	9	10
Magic Kingdom - Revenues		\$0	\$1,000	\$1,400	\$1,700	\$2,000	\$2,200	\$2,420	\$2,662	\$2,928	\$2,987
Epcot Rio - Revenues		\$0	\$0	\$0	\$300	\$500	\$550	\$605	\$666	\$732	\$747
Resort & Properties - Revenues		\$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 – Direct Expenses		\$0	\$600	\$840	\$1,020	\$1,200	\$1,320	\$1,452	\$1,597	\$1,757	\$1,792
Epcot Rio – Direct Expenses		\$0	\$0	\$0	\$180	\$300	\$330	\$363	\$399	\$439	\$448
Resort & Property – Direct Expenses		\$0	\$188	\$263	\$375	\$469	\$516	\$567	\$624	\$686	\$700
Total Direct Expenses			\$788	\$1,103	\$1,575	\$1,969	\$2,166	\$2,382	\$2,620	\$2,882	\$2,940
Depreciation & Amortization		\$50	\$425	\$469	\$444	\$372	\$367	\$364	\$364	\$366	\$368
Allocated G&A Costs		\$0	\$188	\$263	\$375	\$469	\$516	\$567	\$624	\$686	\$700
Operating Income		-\$50	-\$150	-\$84	\$106	\$315	\$389	\$467	\$551	\$641	\$658
Taxes		-\$18	-\$54	-\$30	\$38	\$114	\$141	\$169	\$199	\$231	\$238
Operating Income after Taxes		-\$32	-\$96	-\$54	\$68	\$202	\$249	\$299	\$352	\$410	\$421

Direct expenses: 60% of revenues for theme parks, 75% of revenues for resort properties

Allocated G&A: Company G&A allocated to project, based on projected revenues. Two thirds of expense is fixed, rest is variable.

Taxes: Based on marginal tax rate of 36.1%

And the Accounting View of Return

Year	After-tax Operating Income	BV of pre-project investment	BV of fixed assets	BV of Working capital	BV of Capital	Average BV of Capital	ROC(a)	ROC(b)
0		500	2000	0	\$2,500			
1	-\$32	\$450	\$3,000	\$0	\$3,450	\$2,975	-1.07%	-1.28%
2	-\$96	\$400	\$3,813	\$63	\$4,275	\$3,863	-2.48%	-2.78%
3	-\$54	\$350	\$4,145	\$88	\$4,582	\$4,429	-1.22%	-1.26%
4	\$68	\$300	\$4,027	\$125	\$4,452	\$4,517	1.50%	1.48%
5	\$202	\$250	\$3,962	\$156	\$4,368	\$4,410	4.57%	4.53%
6	\$249	\$200	\$3,931	\$172	\$4,302	\$4,335	5.74%	5.69%
7	\$299	\$150	\$3,931	\$189	\$4,270	\$4,286	6.97%	6.94%
8	\$352	\$100	\$3,946	\$208	\$4,254	\$4,262	8.26%	8.24%
9	\$410	\$50	\$3,978	\$229	\$4,257	\$4,255	9.62%	9.63%
10	\$421	\$0	\$4,010	\$233	\$4,243	\$4,250	9.90%	9.89%
Average							4.18%	4.11%

- (a) Based upon book capital at the start of each year
- (b) Based upon average book capital over the year

What should this return be compared to?

- The computed return on capital on this investment is about 4%. To make a judgment on whether this is a sufficient return, we need to compare this return to a “hurdle rate”. Which of the following is the right hurdle rate? Why or why not?
 - a. The riskfree rate of 2.75% (T. Bond rate)
 - b. The cost of equity for Disney as a company (8.52%)
 - c. The cost of equity for Disney theme parks (7.09%)
 - d. The cost of capital for Disney as a company (7.81%)
 - e. The cost of capital for Disney theme parks (6.61%)
 - f. None of the above

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 in 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 some political risk, which would mean that it too should not affect the discount rate. However, there are aspects of political risk especially in emerging markets that will be difficult to diversify and may 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 Brazil (or any other emerging market)

Estimating a hurdle rate for Rio Disney

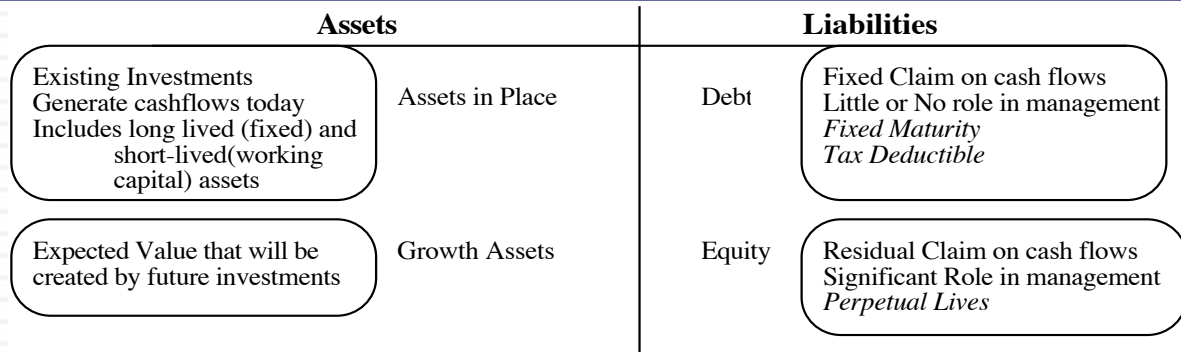
- We did estimate a cost of capital of 6.61% for the Disney theme park business, using a bottom-up levered beta of 0.7537 for the business.
- This cost of equity may not adequately reflect the additional risk associated with the theme park being in an emerging market.
- The only concern we would have with using this cost of equity for this project is that it may not adequately reflect the additional risk associated with the theme park being in an emerging market (Brazil). We first computed the Brazil country risk premium (by multiplying the default spread for Brazil by the relative equity market volatility) and then re-estimated the cost of equity:
 - Country risk premium for Brazil = 5.5% + 3% = 8.5%
 - Cost of Equity in US\$ = 2.75% + 0.7537 (8.5%) = 9.16%
- Using this estimate of the cost of equity, Disney's theme park debt ratio of 10.24% and its after-tax cost of debt of 2.40% (see chapter 4), we can estimate the cost of capital for the project:
 - Cost of Capital in US\$ = 9.16% (0.8976) + 2.40% (0.1024) = 8.46%

Would lead us to conclude that...

- Do not invest in this park. The return on capital of 4.18% is lower than the cost of capital for theme parks of 8.46%; 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?
 - ▣ Yes
 - ▣ No

A Tangent: From New to Existing Investments: ROC for the entire firm

How “good” are the existing investments of the firm?



Measuring ROC for existing investments..

Company	EBIT (1-t)	BV of Debt	BV of Equity	Cash	BV of Capital	Return on Capital	Cost of Capital	ROC - Cost of Capital
Disney	\$6,920	\$16,328	\$41,958	\$3,387	\$54,899	12.61%	7.81%	4.80%
Yandex	9,868 R	0 R	37,047 R	12,130	24,917 F	39.61%	16.78%	17.55%

The cash flow view of this project..

	0	1	2	3	4	5	6	7	8	9	10
After-tax Operating Income		-\$32	-\$96	-\$54	\$68	\$202	\$249	\$299	\$352	\$410	\$421
+ Depreciation & Amortization	\$0	\$50	\$425	\$469	\$444	\$372	\$367	\$364	\$364	\$366	\$368
- Capital Expenditures	\$2,500	\$1,000	\$1,188	\$752	\$276	\$258	\$285	\$314	\$330	\$347	\$350
- Change in non-cash Work Capital		\$0	\$63	\$25	\$38	\$31	\$16	\$17	\$19	\$21	\$5
Cashflow to firm	(\$2,500)	(\$982)	(\$921)	(\$361)	\$198	\$285	\$314	\$332	\$367	\$407	\$434

To get from income to cash flow, we

- I. added back all non-cash charges such as depreciation. Tax benefits:

	1	2	3	4	5	6	7	8	9	10
Depreciation	\$50	\$425	\$469	\$444	\$372	\$367	\$364	\$364	\$366	\$368
Tax Benefits from Depreciation	\$18	\$153	\$169	\$160	\$134	\$132	\$132	\$132	\$132	\$133

- II. subtracted out the capital expenditures
- III. subtracted out the change in non-cash working capital

The incremental cash flows on the project

	0	1	2	3	4	5	6	7	8	9	10
After-tax Operating Income		-\$32	-\$96	-\$54	\$68	\$202	\$249	\$299	\$352	\$410	\$421
+ Depreciation & Amortization	\$0	\$50	\$425	\$469	\$444	\$372	\$367	\$364	\$364	\$366	\$368
- Capital Expenditures	\$2,500	\$1,000	\$1,188	\$752	\$276	\$258	\$285	\$314	\$330	\$347	\$350
- Change in non-cash Working Capital		\$0	\$63	\$25	\$38	\$31	\$16	\$17	\$19	\$21	\$5
Cashflow to firm	(\$2,500)	(\$982)	(\$921)	(\$361)	\$198	\$285	\$314	\$332	\$367	\$407	\$434
+ Pre-project investment (sunk)	\$500										
- Pre-project Depreciation * tax rate		\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18
+ Non-incremental Allocated Expense (1-t)		\$0	\$80	\$112	\$160	\$200	\$220	\$242	\$266	\$292	\$298
Incremental Cash flow to the firm	(\$2,000)	(\$1,000)	(\$860)	(\$267)	\$340	\$467	\$516	\$555	\$615	\$681	\$715

\$ 500 million has already been spent & \$ 50 million in depreciation will exist anyway

2/3rd of allocated G&A is fixed.
Add back this amount (1-t)
Tax rate = 36.1%

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

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 $IRR > \text{hurdle rate}$

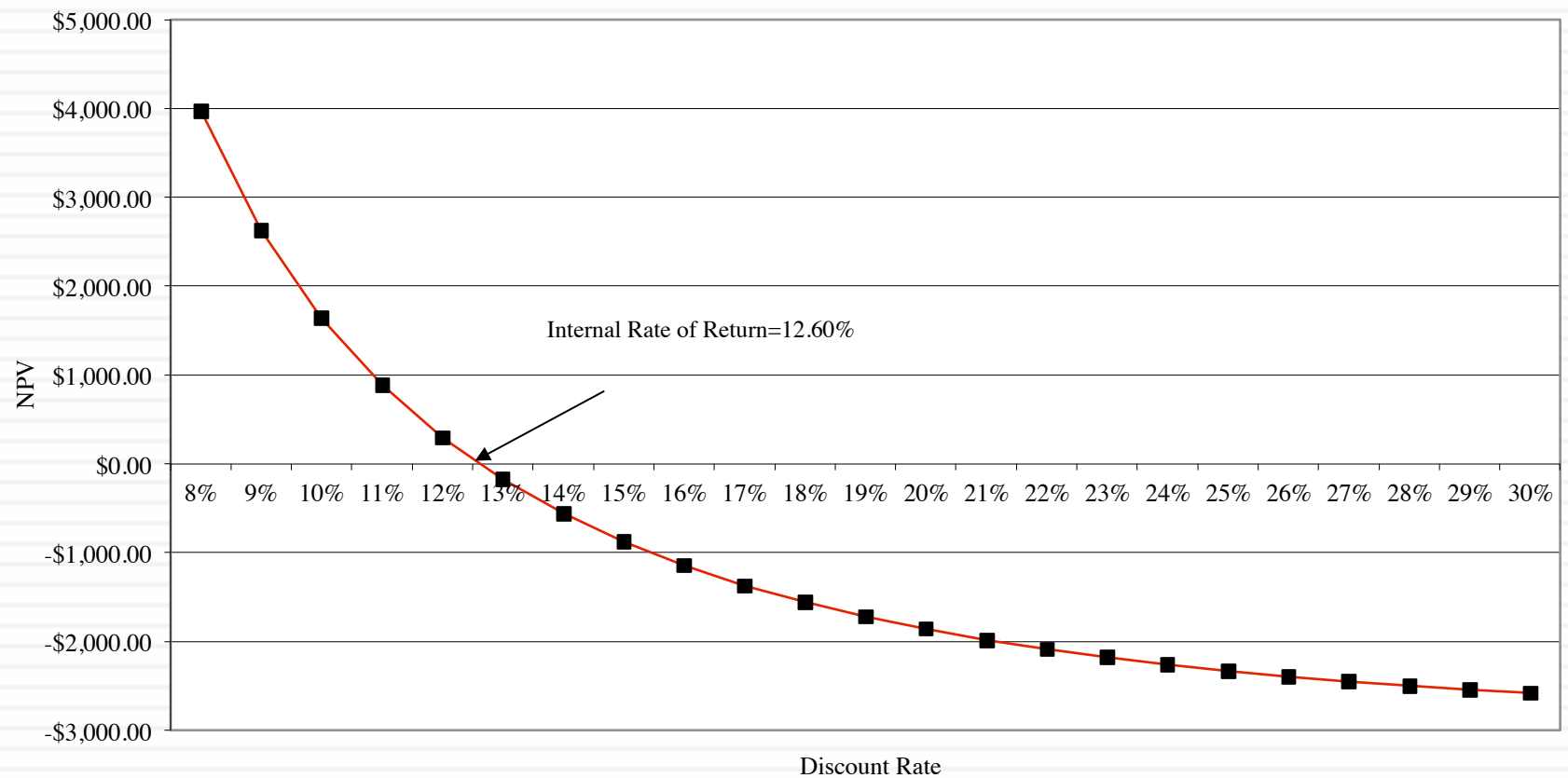
Closure on Cash Flows

- 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= $CF \text{ in year } 11 / (\text{Cost of Capital} - \text{Growth Rate})$
 $= 715 (1.02) / (.0846 - .02) = \$ 11,275 \text{ million}$

Which yields a NPV of..

Year	Annual Cashflow	Terminal Value	Present Value
0	-\$2,000		-\$2,000
1	-\$1,000		-\$922
2	-\$859		-\$730
3	-\$267		-\$210
4	\$340		\$246
5	\$466		\$311
6	\$516		\$317
7	\$555		\$314
8	\$615		\$321
9	\$681		\$328
10	\$715	\$11,275	\$5,321
			\$3,296

The IRR of this project



Disney Theme Park: The irrelevance of currency

Expected Exchange Rate_t
 = Exchange Rate today * (1.09/1.02)^t

Discount at \$R cost of capital
 = (1.0846) (1.09/1.02) - 1 = 15.91%

Year	Cashflow (\$)	\$R/\$	Cashflow (Bt)	Present Value
0	-R\$ 2,000	R\$ 2.35	-R\$ 4,700	-R\$ 4,700
1	-R\$ 1,000	R\$ 2.51	-R\$ 2,511	-R\$ 2,167
2	-R\$ 859	R\$ 2.68	-R\$ 2,305	-R\$ 1,716
3	-R\$ 267	R\$ 2.87	-R\$ 767	-R\$ 492
4	R\$ 340	R\$ 3.06	R\$ 1,043	R\$ 578
5	R\$ 466	R\$ 3.27	R\$ 1,527	R\$ 730
6	R\$ 516	R\$ 3.50	R\$ 1,807	R\$ 745
7	R\$ 555	R\$ 3.74	R\$ 2,076	R\$ 739
8	R\$ 615	R\$ 4.00	R\$ 2,458	R\$ 754
9	R\$ 681	R\$ 4.27	R\$ 2,910	R\$ 771
10	R\$ 11,990	R\$ 4.56	R\$ 54,720	R\$ 12,504
				R\$ 7,745

NPV = R\$ 7,745/2.35= \$ 3,296 Million
 NPV is equal to NPV in dollar terms

One simplistic solution: See how quickly you can get your money back...

- If your biggest fear is losing the billions that you invested in the project, one simple measure that you can compute is the number of years it will take you to get your money back.

Year	Cash Flow	Cumulated CF	PV of Cash Flow	Cumulated DCF
0	-\$2,000	-\$2,000	-\$2,000	-\$2,000
1	-\$1,000	-\$3,000	-\$922	-\$2,922
2	-\$859	-\$3,859	-\$730	-\$3,652
3	-\$267	-\$4,126	-\$210	-\$3,862
4	\$340	-\$3,786	\$246	-\$3,616
5	\$466	-\$3,320	\$311	-\$3,305
6	\$516	-\$2,803	\$317	-\$2,988
7	\$555	-\$2,248	\$314	-\$2,674
8	\$615	-\$1,633	\$321	-\$2,353
9	\$681	-\$952	\$328	-\$2,025
10	\$715	-\$237	\$317	-\$1,708
11	\$729	\$491	\$298	-\$1,409
12	\$743	\$1,235	\$280	-\$1,129
13	\$758	\$1,993	\$264	-\$865
14	\$773	\$2,766	\$248	-\$617
15	\$789	\$3,555	\$233	-\$384
16	\$805	\$4,360	\$219	-\$165
17	\$821	\$5,181	\$206	\$41

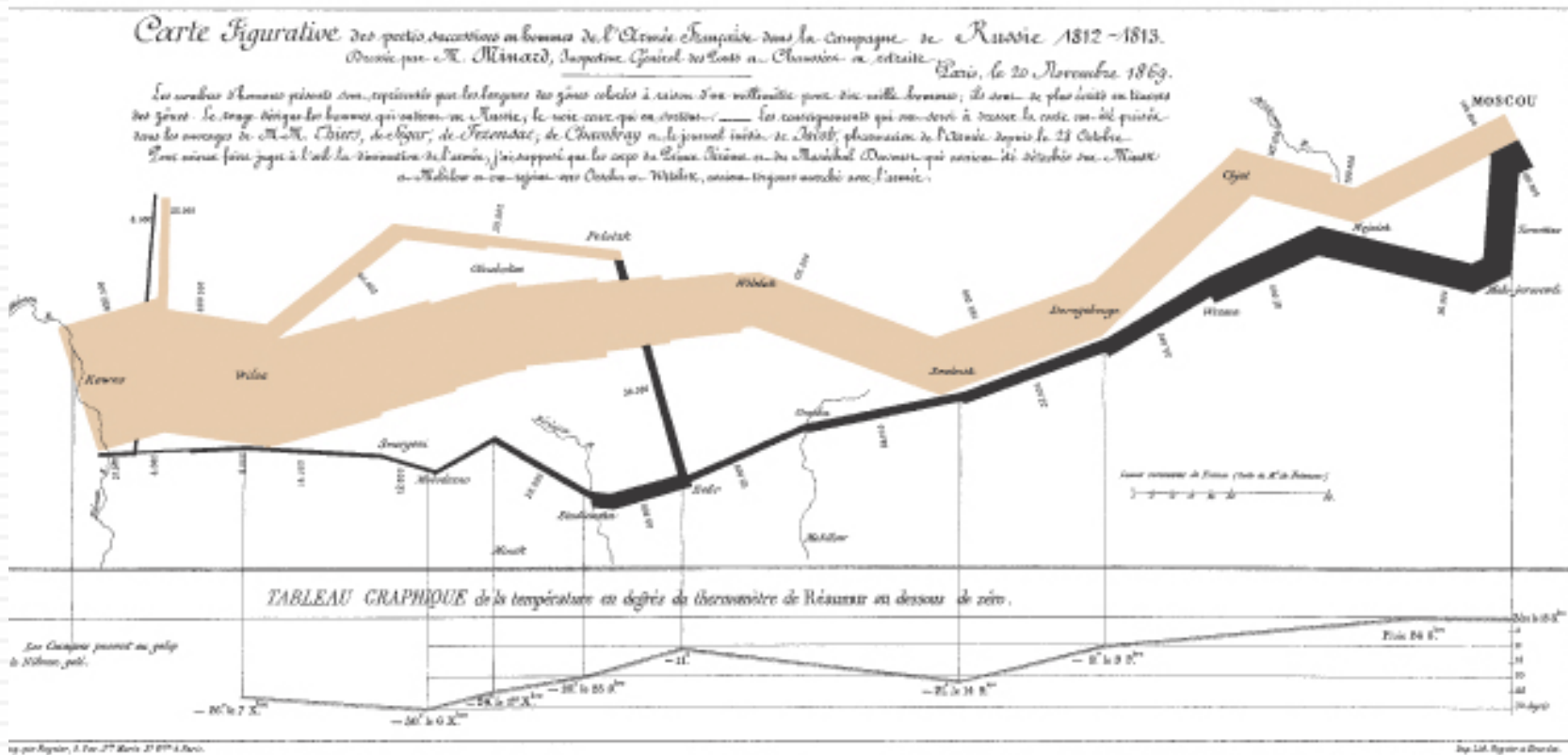
Payback = 10.3 years →

Discounted Payback = 16.8 years

A slightly more sophisticated approach: Sensitivity Analysis & What-if Questions...

- The NPV, IRR and accounting returns for an investment will change as we change the values that we use for different variables.
- One way of analyzing uncertainty is to check to see how sensitive the decision measure (NPV, IRR..) is to changes in key assumptions. While this has become easier and easier to do over time, there are caveats that we would offer.
- Caveat 1: When analyzing the effects of changing a variable, we often hold all else constant. In the real world, variables move together.
- Caveat 2: The objective in sensitivity analysis is that we make better decisions, not churn out more tables and numbers.
 - Corollary 1: Less is more. Not everything is worth varying...
 - Corollary 2: A picture is worth a thousand numbers (and tables).

And here is a really good picture...

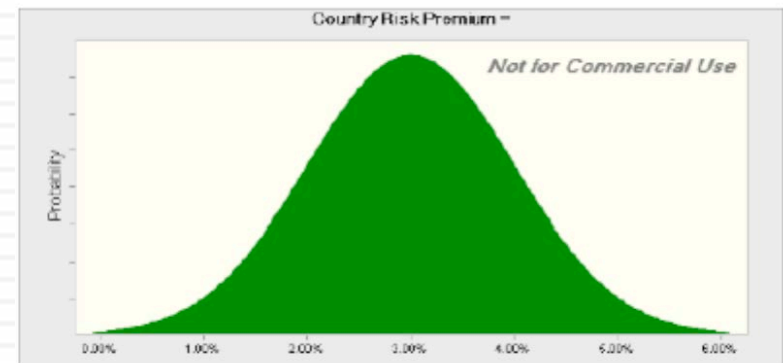


The final step up: Incorporate probabilistic estimates.. Rather than expected values..

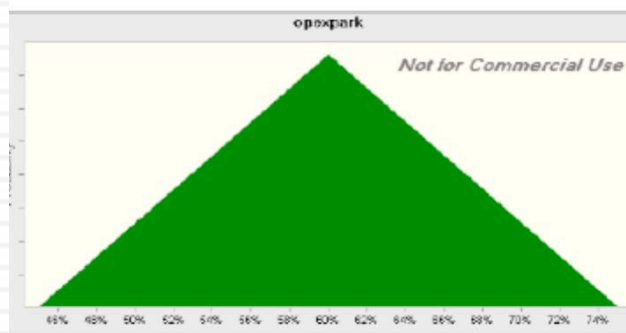
Actual Revenues as % of Forecasted Revenues (Base case = 100%)



Country Risk Premium (Base Case = 3% (Brazil))

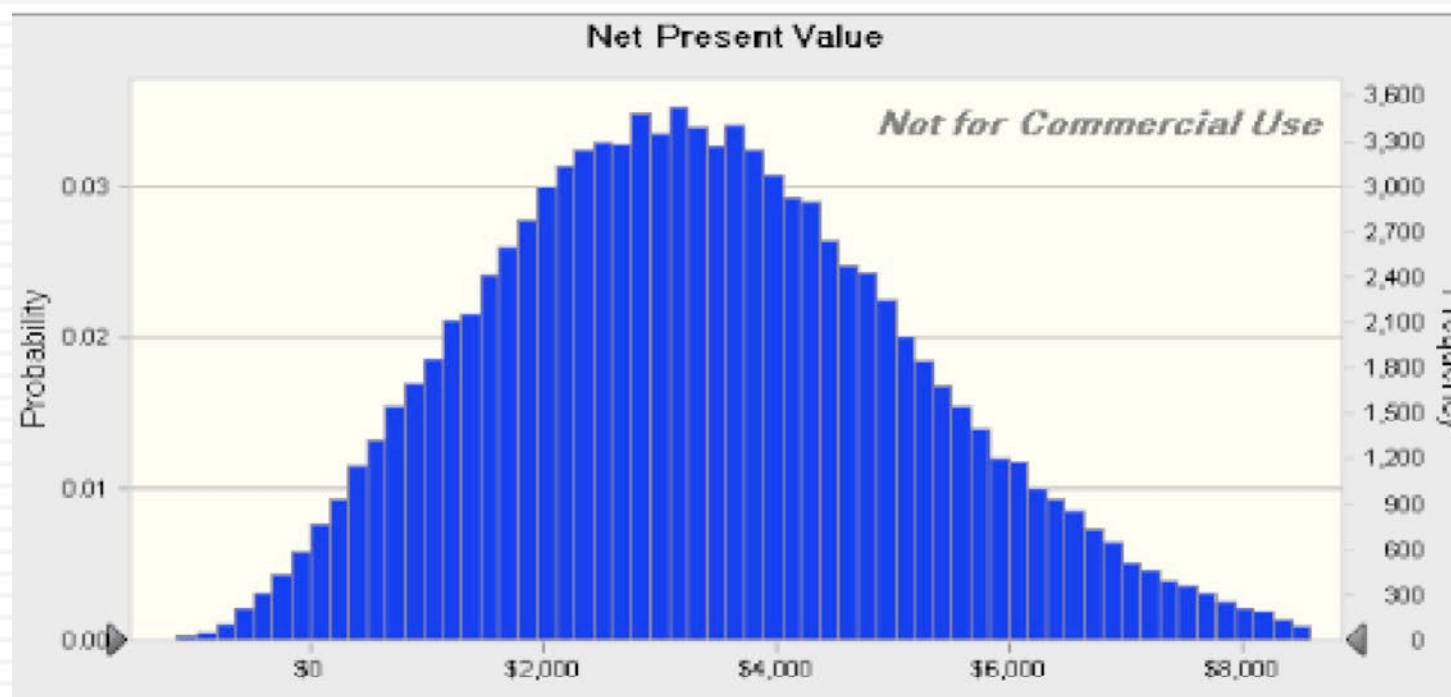


Operating Expenses at Parks as % of Revenues (Base Case = 60%)



The resulting simulation...

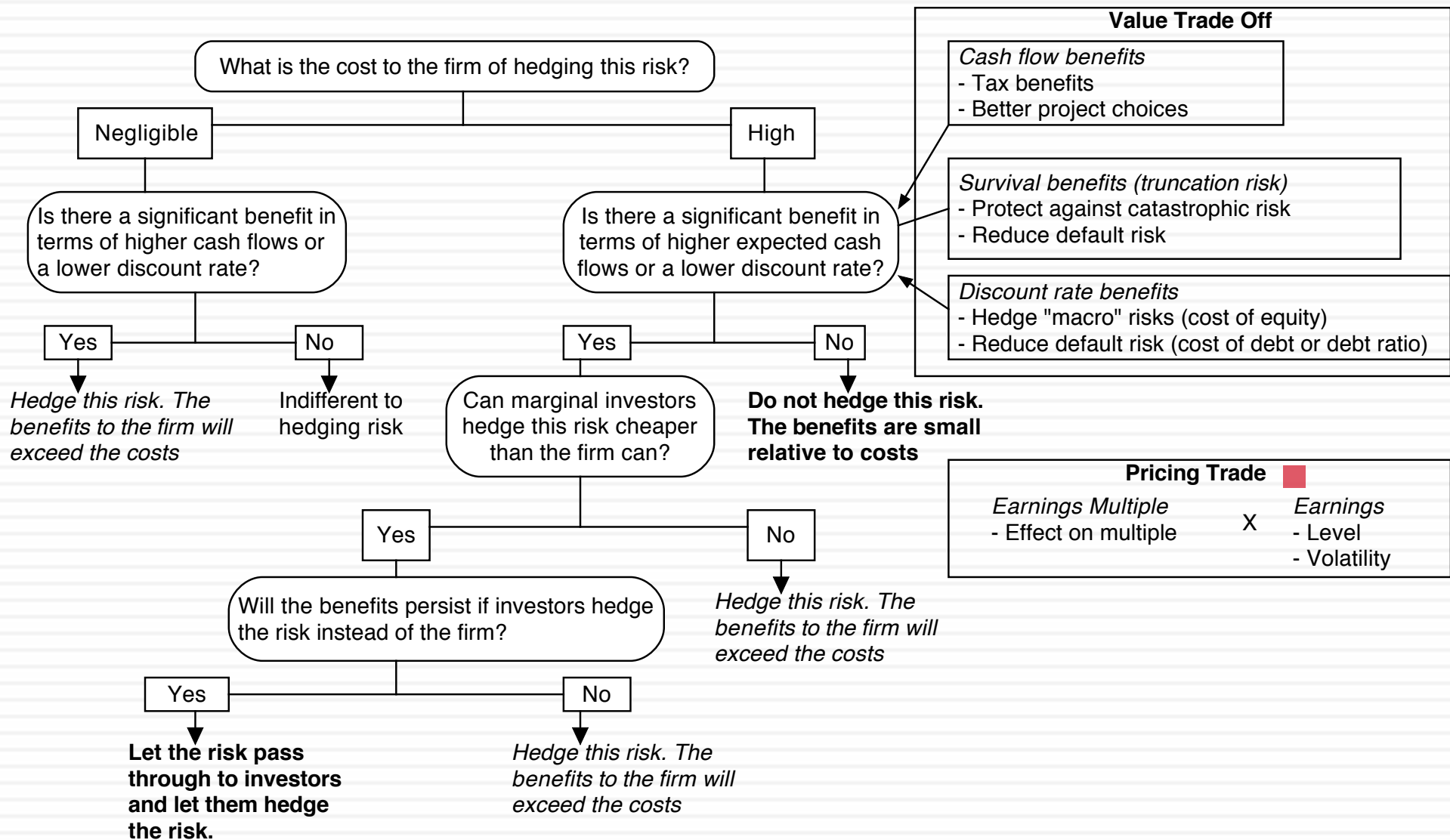
Average = \$3.40 billion
Median = \$3.28 billion



NPV ranges from -\$1 billion to +\$8.5 billion. NPV is negative 12% of the time.

A side bar: Should you hedge risks?

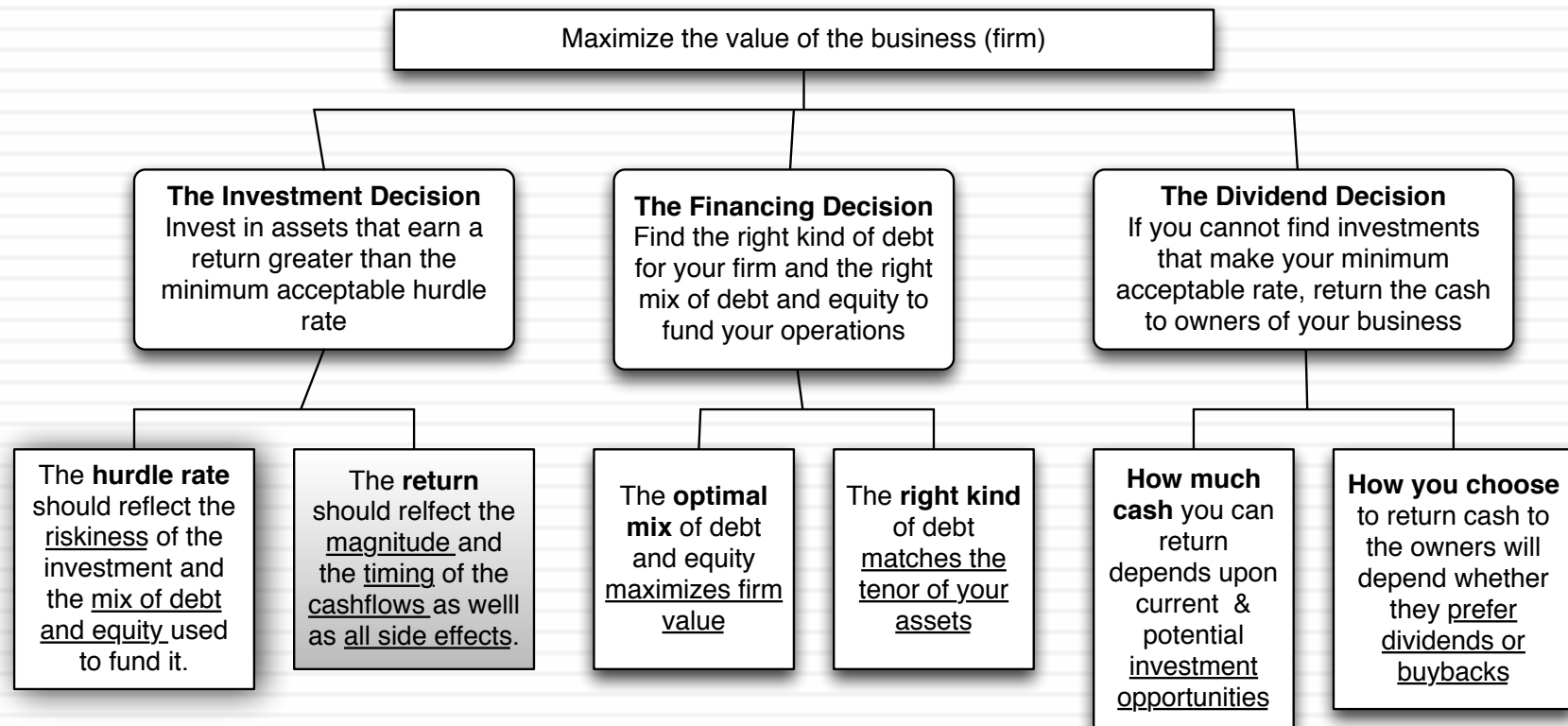
- Disney can reduce the risk in this project by hedging against exchange rate risk. Should it?
 - a. Yes
 - b. No
 - c. Maybe



A final thought: 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





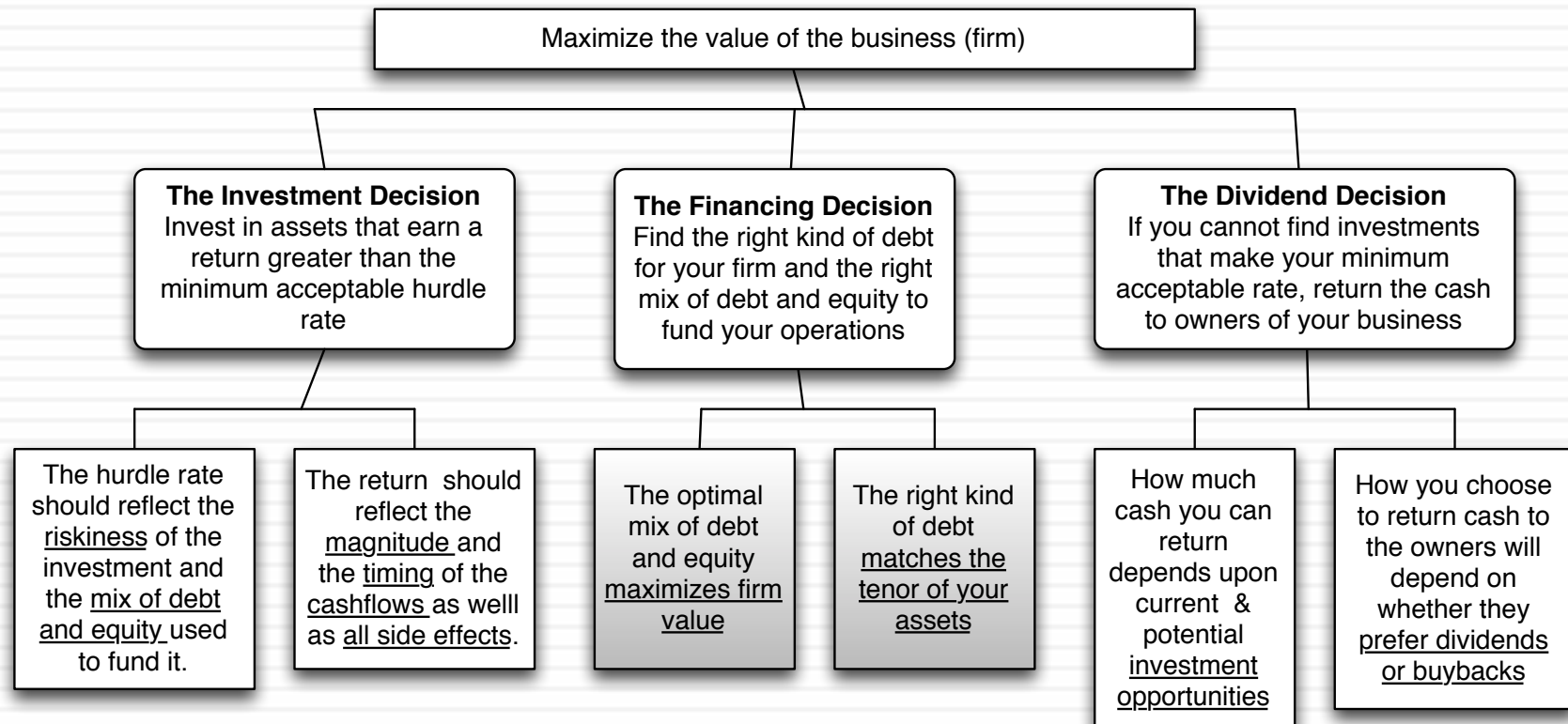
Aswath Damodaran

CAPITAL STRUCTURE: THE CHOICES AND THE TRADE OFF

“Neither a borrower nor a lender be”

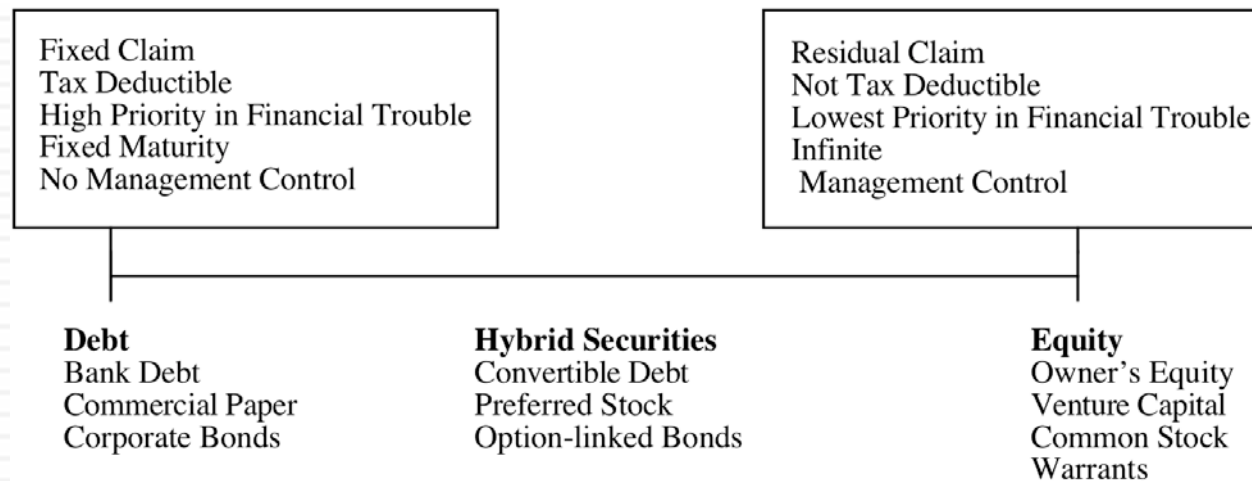
Someone who obviously hated this part of corporate finance

First Principles



Debt or Equity: The Continuum

Figure 7.1: Debt versus Equity



- 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:
- $\text{Debt to Capital Ratio} = \text{Debt} / (\text{Debt} + \text{Equity})$
- In general, this ratio should be computed using market values for both debt and equity, and include all debt.

Debt: Summarizing the trade off

<i>Advantages of Debt</i>	<i>Disadvantages of debt</i>
<p>1. Tax Benefit: Interest expenses on debt are tax deductible but cash flows to equity are generally not. <i>Implication: The higher the marginal tax rate, the greater the benefits of debt.</i></p>	<p>1. Expected Bankruptcy Cost: The expected cost of going bankrupt is a product of the probability of going bankrupt and the cost of going bankrupt. The latter includes both direct and indirect costs. The probability of going bankrupt will be higher in businesses with more volatile earnings and the cost of bankruptcy will also vary across businesses. <i>Implication:</i> <ol style="list-style-type: none"> <i>Firms with more stable earnings should borrow more, for any given level of earnings.</i> <i>Firms with lower bankruptcy costs should borrow more, for any given level of earnings.</i> </p>
<p>2. Added Discipline: Borrowing money may force managers to think about the consequences of the investment decisions a little more carefully and reduce bad investments. <i>Implication: As the separation between managers and stockholders increases, the benefits to using debt will go up.</i></p>	<p>2. Agency Costs: Actions that benefit equity investors may hurt lenders. The greater the potential for this conflict of interest, the greater the cost borne by the borrower (as higher interest rates or more covenants). <i>Implication: Firms where lenders can monitor/ control how their money is being used should be able to borrow more than firms where this is difficult to do.</i></p>
	<p>3. Loss of flexibility: Using up available debt capacity today will mean that you cannot draw on it in the future. This loss of flexibility can be disastrous if funds are needed and access to capital is shut off. <i>Implication:</i> <ol style="list-style-type: none"> <i>Firms that can forecast future funding needs better should be able to borrow more.</i> <i>Firms with better access to capital markets should be more willing to borrow more today.</i> </p>

A Hypothetical Scenario

Assume that you live in a world where

- (a) There are no taxes
- (b) Managers have stockholder interests at heart and do what's best for stockholders.
- (c) No firm ever goes bankrupt
- (d) Equity investors are honest with lenders; there is no subterfuge or attempt to find loopholes in loan agreements.
- (e) Firms know their future financing needs with certainty

Benefits of debt	Costs of debt
Tax benefits	Expected Bankruptcy Cost
Added Discipline	Agency Costs
	Need for financial flexibility

The Miller-Modigliani Theorem

- In an environment, where there are no taxes, default risk or agency costs, capital structure is irrelevant.
- In this world,
 - 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

Optimizing capital structure: Cost of capital approach

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

Current Cost of Capital: Disney

- The beta for Disney's stock in November 2013 was 1.0013. The T. bond rate at that time was 2.75%. Using an estimated equity risk premium of 5.76%, we estimated the cost of equity for Disney to be 8.52%:

$$\text{Cost of Equity} = 2.75\% + 1.0013(5.76\%) = 8.52\%$$

- Disney's bond rating in May 2009 was A, and based on this rating, the estimated pretax cost of debt for Disney is 3.75%. Using a marginal tax rate of 36.1, the after-tax cost of debt for Disney is 2.40%.

$$\text{After-Tax Cost of Debt} = 3.75\% (1 - 0.361) = 2.40\%$$

- The cost of capital was calculated using these costs and the weights based on market values of equity (121,878) and debt (15,961):

$$\text{Cost of capital} = 8.52\% \frac{121,878}{(15,961+121,878)} + 2.40\% \frac{15,961}{(15,961+121,878)} = 7.81\%$$

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.

I. Cost of Equity

Debt to Capital Ratio	D/E Ratio	Levered Beta	Cost of Equity
0%	0.00%	0.9239	8.07%
10%	11.11%	0.9895	8.45%
20%	25.00%	1.0715	8.92%
30%	42.86%	1.1770	9.53%
40%	66.67%	1.3175	10.34%
50%	100.00%	1.5143	11.48%
60%	150.00%	1.8095	13.18%
70%	233.33%	2.3016	16.01%
80%	400.00%	3.2856	21.68%
90%	900.00%	6.2376	38.69%

$$\text{Levered Beta} = 0.9239 (1 + (1 - .361) (D/E))$$

$$\text{Cost of equity} = 2.75\% + \text{Levered beta} * 5.76\%$$

2. Cost of Debt

Debt Ratio	\$ Debt	Interest Expense	Interest Coverage Ratio	Bond Rating	Pre-tax cost of debt	Tax rate	After-tax cost of debt
0%	\$0	\$0	∞	Aaa/AAA	3.15%	36.10%	2.01%
10%	\$13,784	\$434	23.10	Aaa/AAA	3.15%	36.10%	2.01%
20%	\$27,568	\$868	11.55	Aaa/AAA	3.15%	36.10%	2.01%
30%	\$41,352	\$1,427	7.03	Aa2/AA	3.45%	36.10%	2.20%
40%	\$55,136	\$2,068	4.85	A2/A	3.75%	36.10%	2.40%
50%	\$68,919	\$6,892	1.46	B3/B-	10.00%	36.10%	6.39%
60%	\$82,703	\$9,511	1.05	Caa/CCC	11.50%	36.10%	7.35%
70%	\$96,487	\$11,096	0.90	Caa/CCC	11.50%	32.64%	7.75%
80%	\$110,271	\$13,508	0.74	Ca2/CC	12.25%	26.81%	8.97%
90%	\$124,055	\$16,437	0.61	C2/C	13.25%	22.03%	10.33%

Disney's cost of capital schedule...

Debt Ratio	Beta	Cost of Equity	Cost of Debt (after-tax)	WACC
0%	0.9239	8.07%	2.01%	8.07%
10%	0.9895	8.45%	2.01%	7.81%
20%	1.0715	8.92%	2.01%	7.54%
30%	1.1770	9.53%	2.20%	7.33%
40%	1.3175	10.34%	2.40%	7.16%
50%	1.5143	11.48%	6.39%	8.93%
60%	1.8095	13.18%	7.35%	9.68%
70%	2.3762	16.44%	7.75%	10.35%
80%	3.6289	23.66%	8.97%	11.90%
90%	7.4074	45.43%	10.33%	13.84%

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

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

Yandex: Optimal Capital Structure

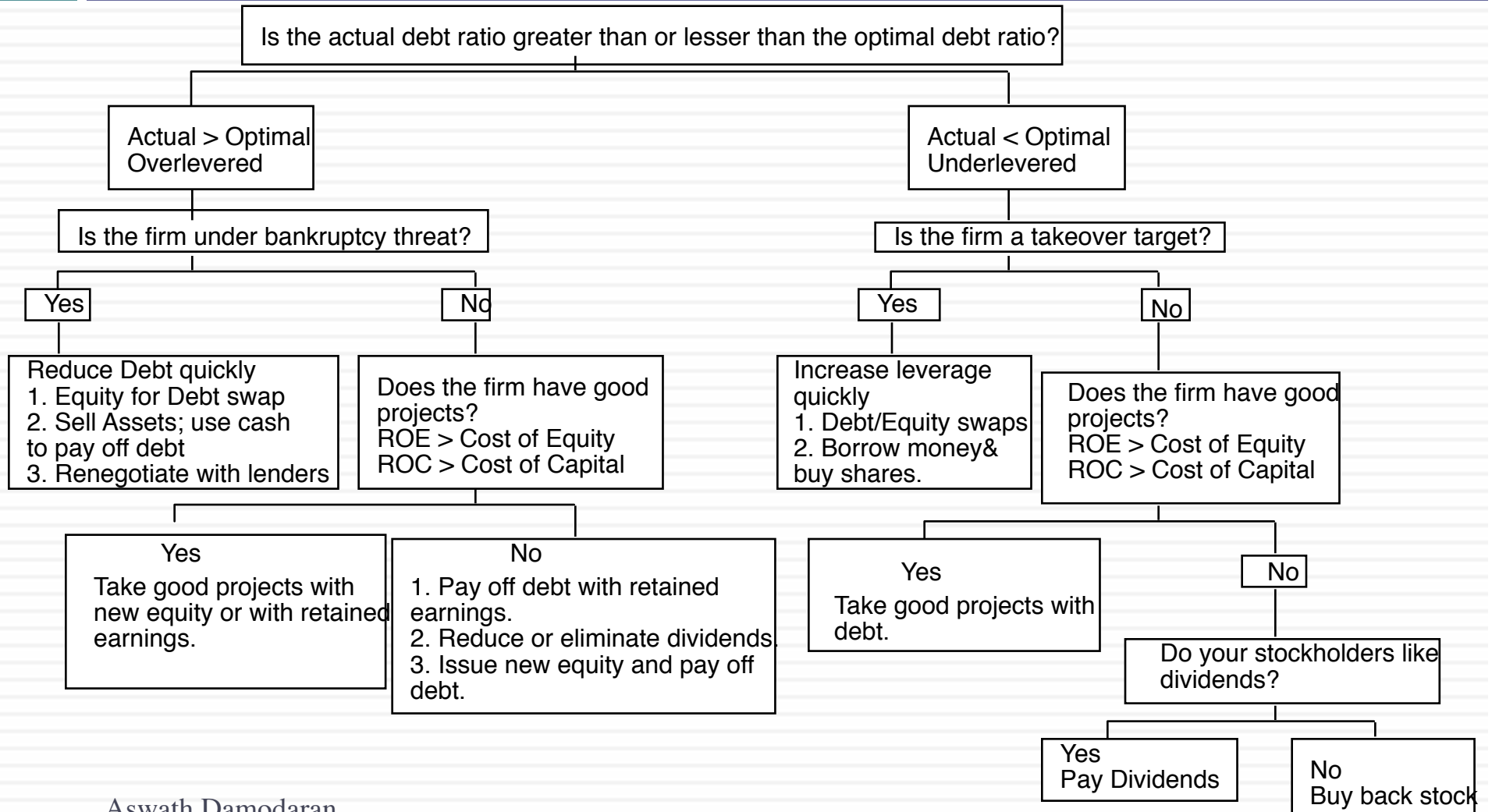
Debt Ratio	Beta	Cost of Equity	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC	Enterprise Value (RUB)
0%	1.1300	16.83%	Aaa/AAA	9.22%	20.00%	7.38%	16.83%	332,097
10%	1.2304	17.76%	B2/B	15.32%	20.00%	12.26%	17.21%	320,479
20%	1.3606	18.97%	Ca2/CC	18.32%	18.37%	14.96%	18.17%	294,580
30%	1.5581	20.80%	C2/C	19.32%	11.61%	17.08%	19.68%	261,056
40%	1.8225	23.25%	D2/D	20.82%	8.08%	19.14%	21.60%	228,129
50%	2.1869	26.62%	D2/D	20.82%	6.46%	19.47%	23.05%	208,363
60%	2.7337	31.68%	D2/D	20.82%	5.39%	19.70%	24.49%	191,749
70%	3.6449	40.12%	D2/D	20.82%	4.62%	19.86%	25.94%	177,589
80%	5.4674	57.00%	D2/D	20.82%	4.04%	19.98%	27.38%	165,377
90%	10.9347	107.63%	D2/D	20.82%	3.59%	20.07%	28.83%	154,736

At its existing debt ratio of 7.92%, the company may be either close to correctly levered or slightly over levered.

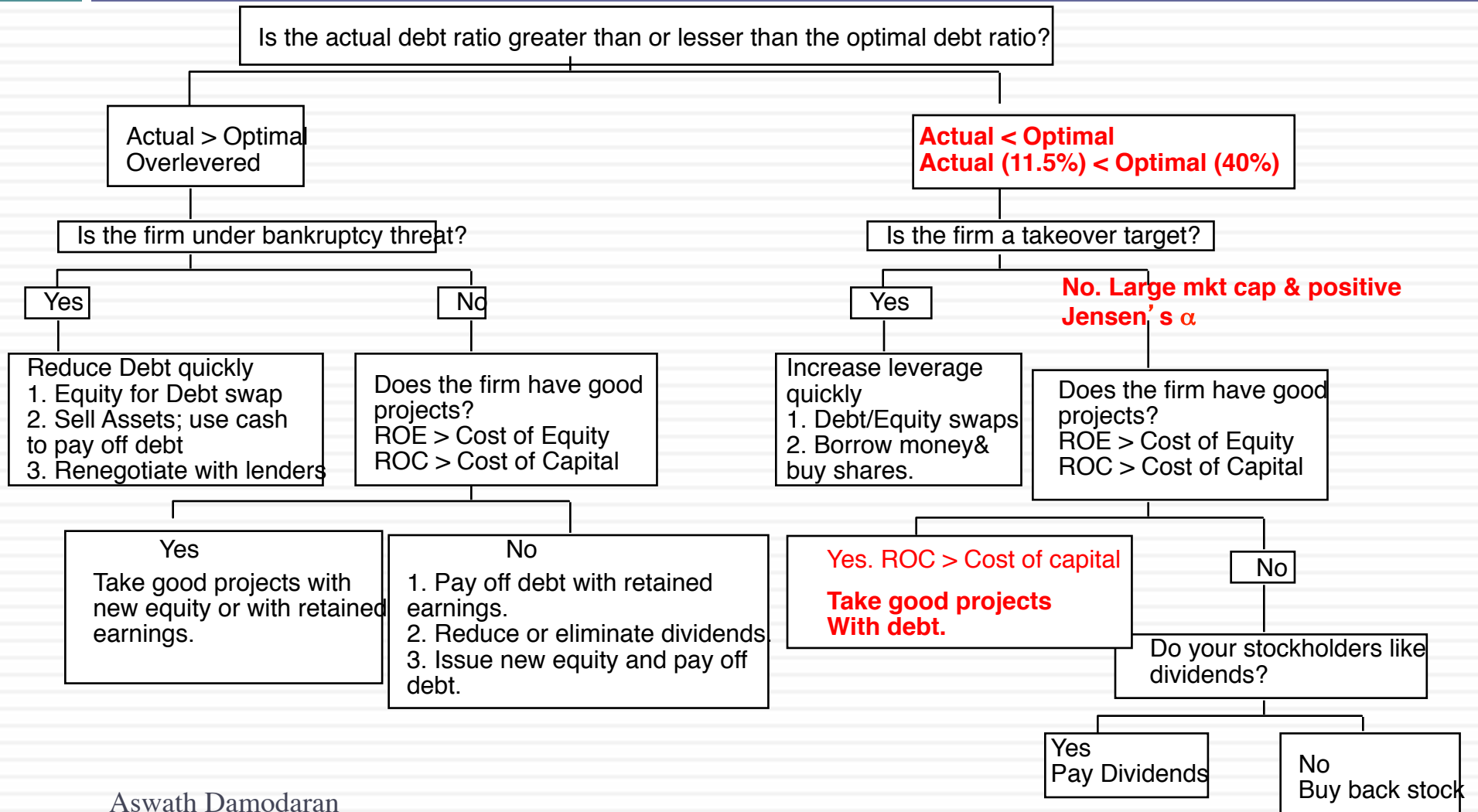
Now that we have an optimal.. And an actual.. What next?

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

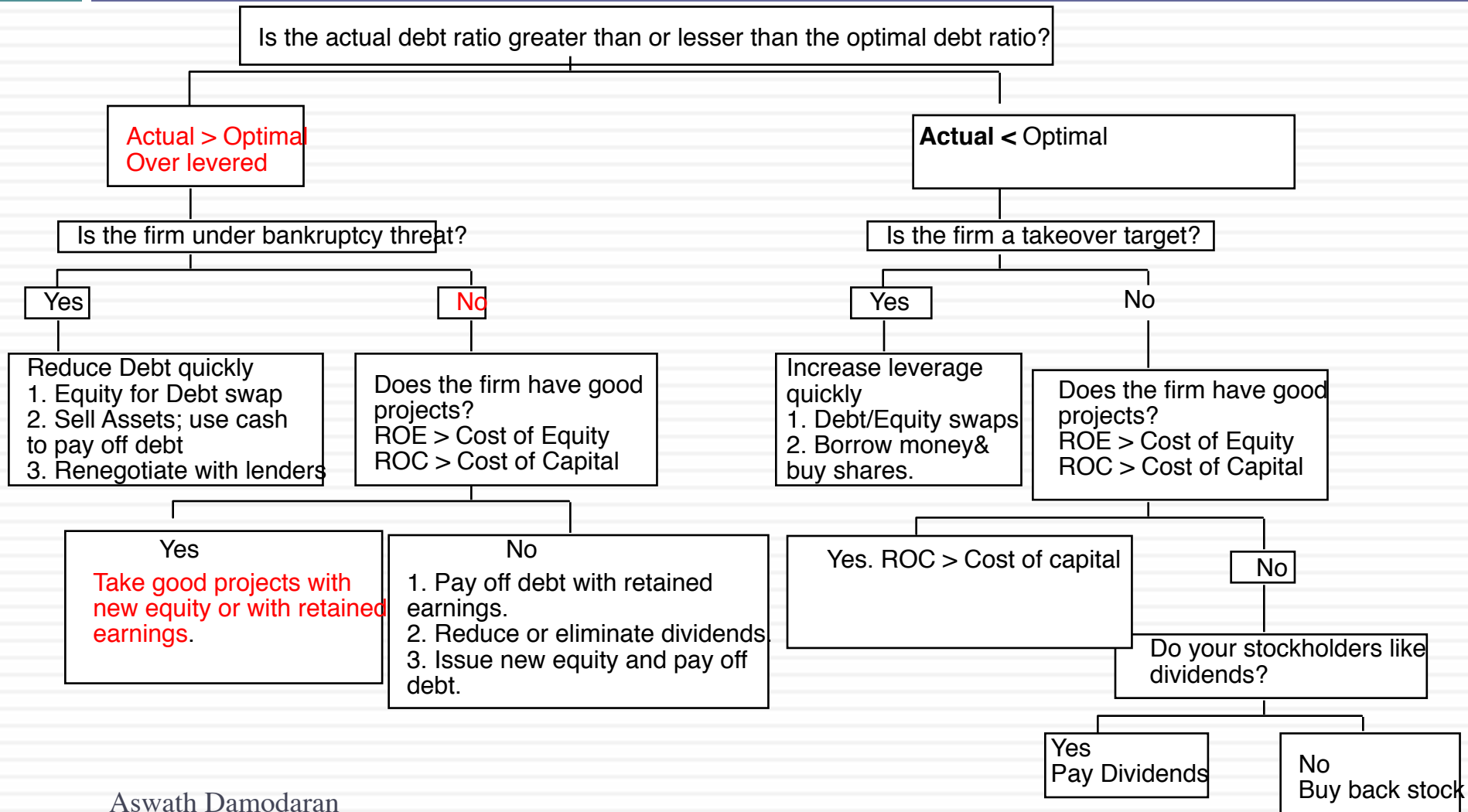
A Framework for Getting to the Optimal



Disney: Applying the Framework



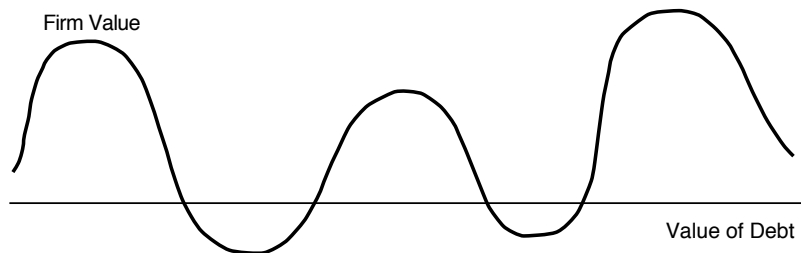
Yandex: Applying the Framework



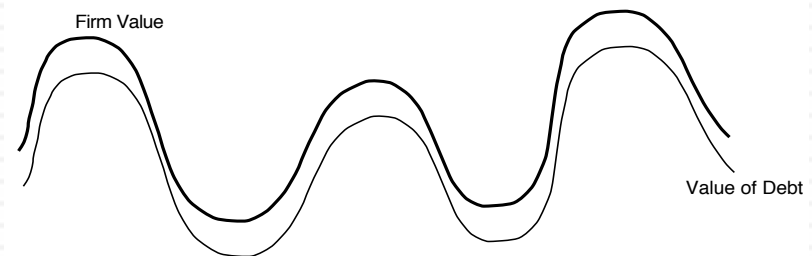
Designing Debt: The Fundamental Principle

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

Unmatched Debt



Matched Debt



Designing Disney's Debt

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

Recommendations for Disney

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

Analyzing Disney's Current Debt

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

Adjusting Debt at Disney

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

Analyzing Yandex debt

- Given that Yandex gets almost all of its revenues in Russia, you would expect its debt to be in Russian rubles.
- Since the technology business is short term, you would expect the debt to be short term debt.
- Since the company is expected to grow and has limited cash flows today, you would expect the debt to be convertible.

Yandex's actual debt is, in fact, composed of convertible debt and leases, though the former is in US dollars.

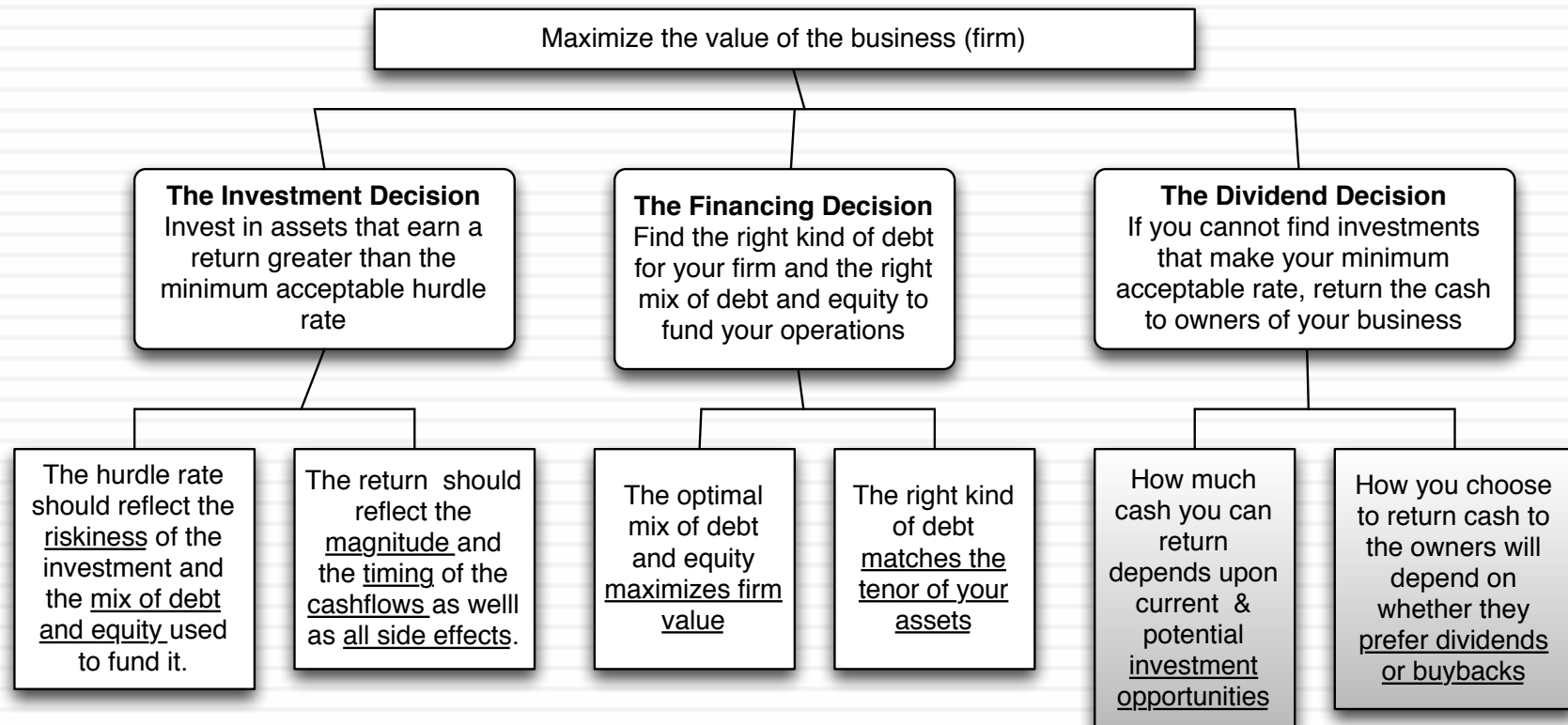


Aswath Damodaran

RETURNING CASH TO THE OWNERS: DIVIDEND POLICY

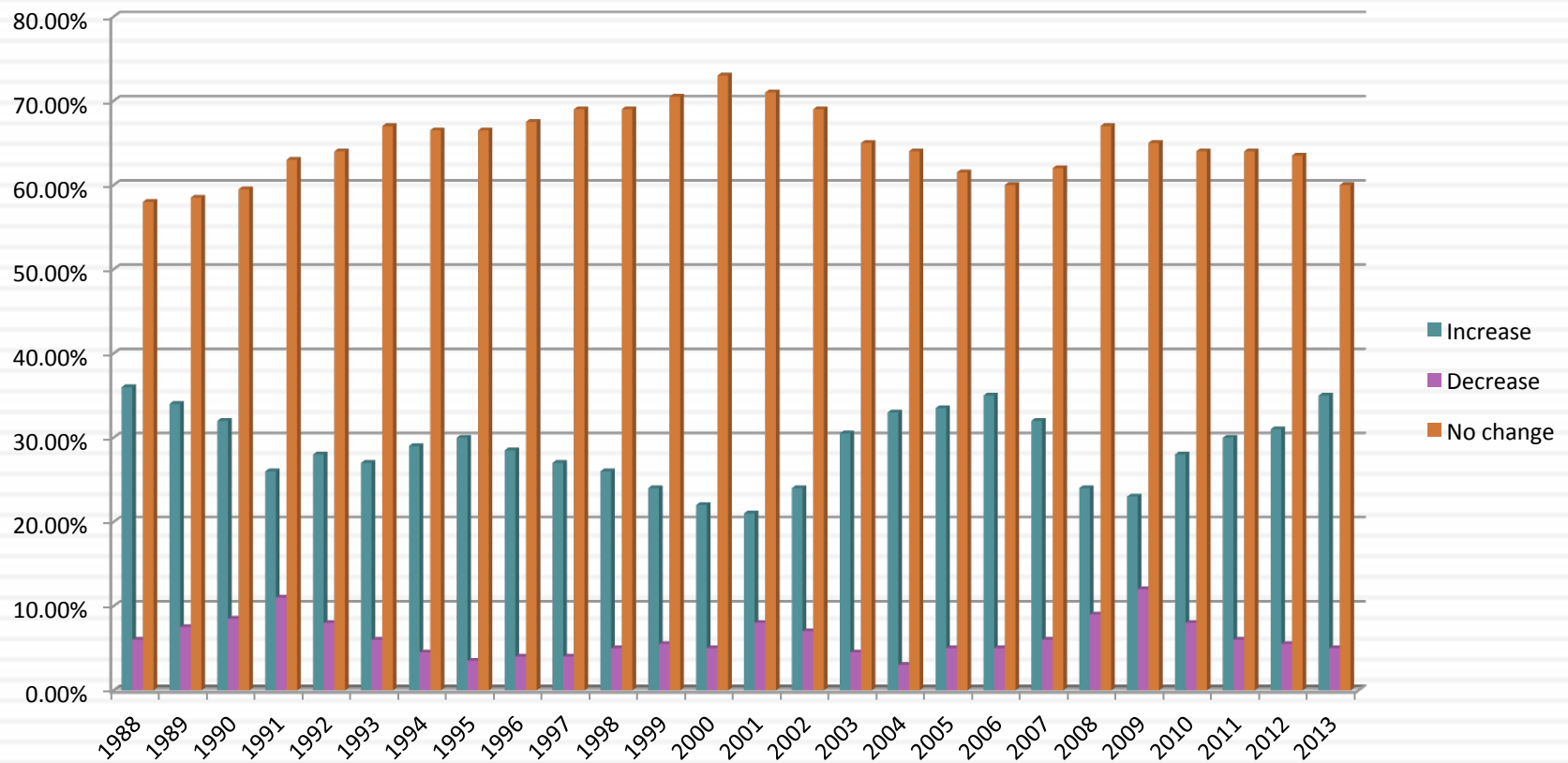
“Companies don’t have cash. They hold cash for their stockholders.”

First Principles



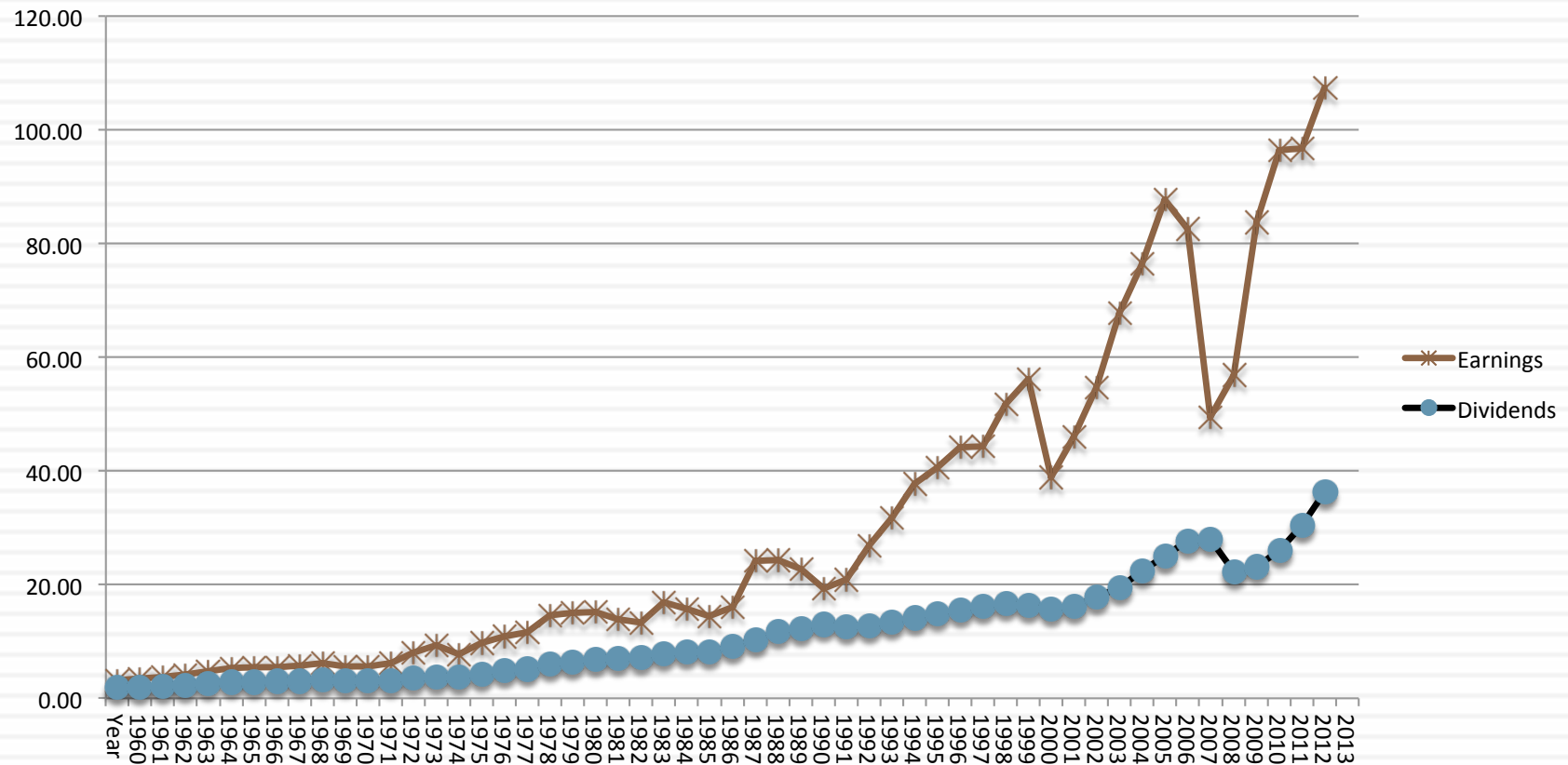
I. Dividends are sticky

Dividend Changes at US companies



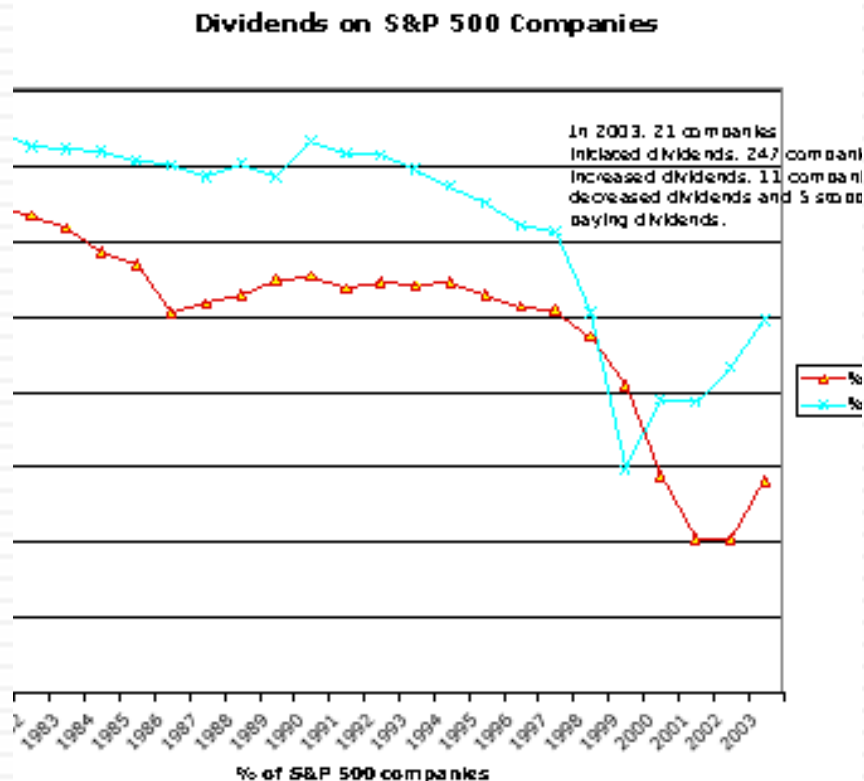
II. Dividends tend to follow earnings

S&P 500: Dividends and Earnings - 1960 to 2013



II. Are affected by tax laws...

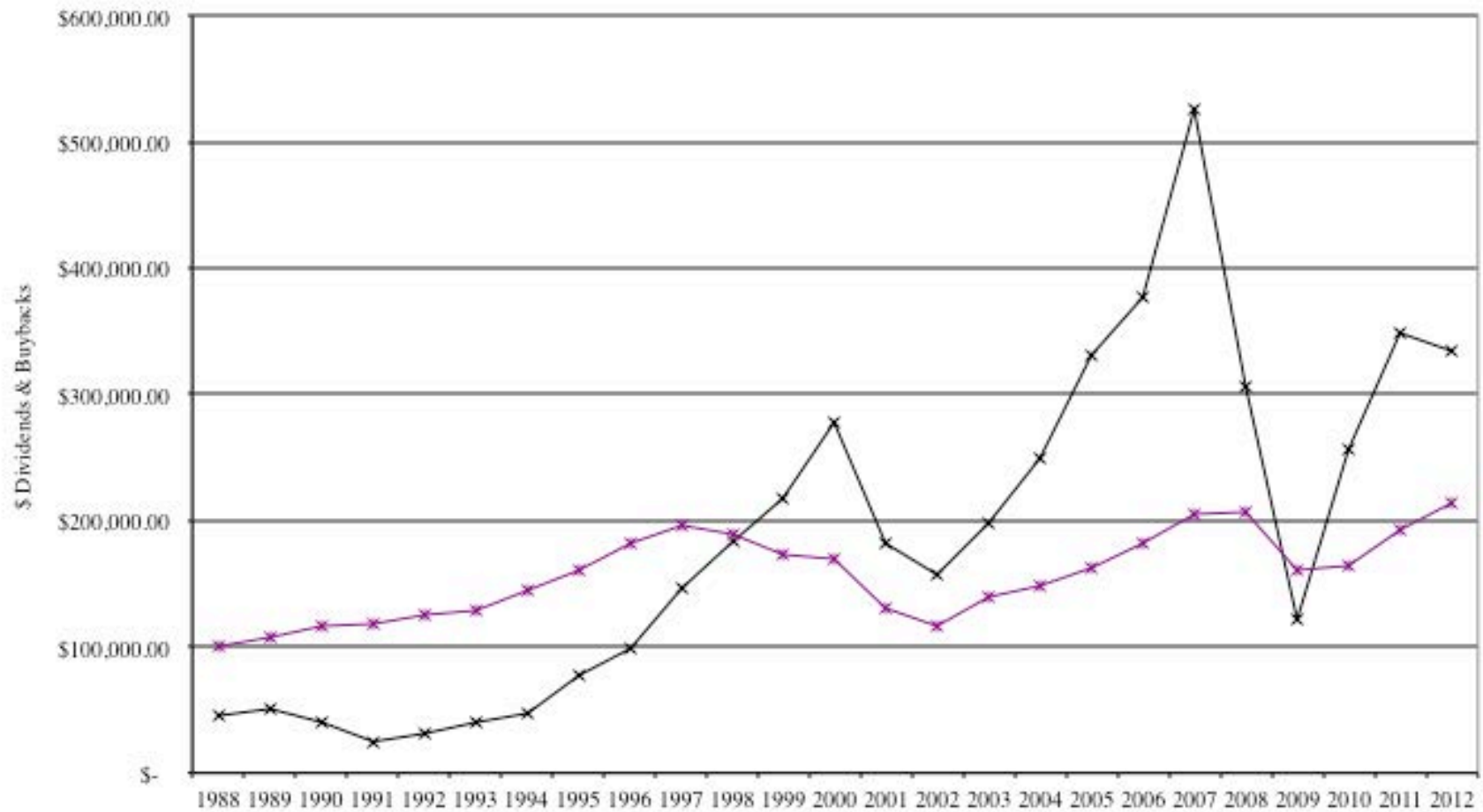
In 2003



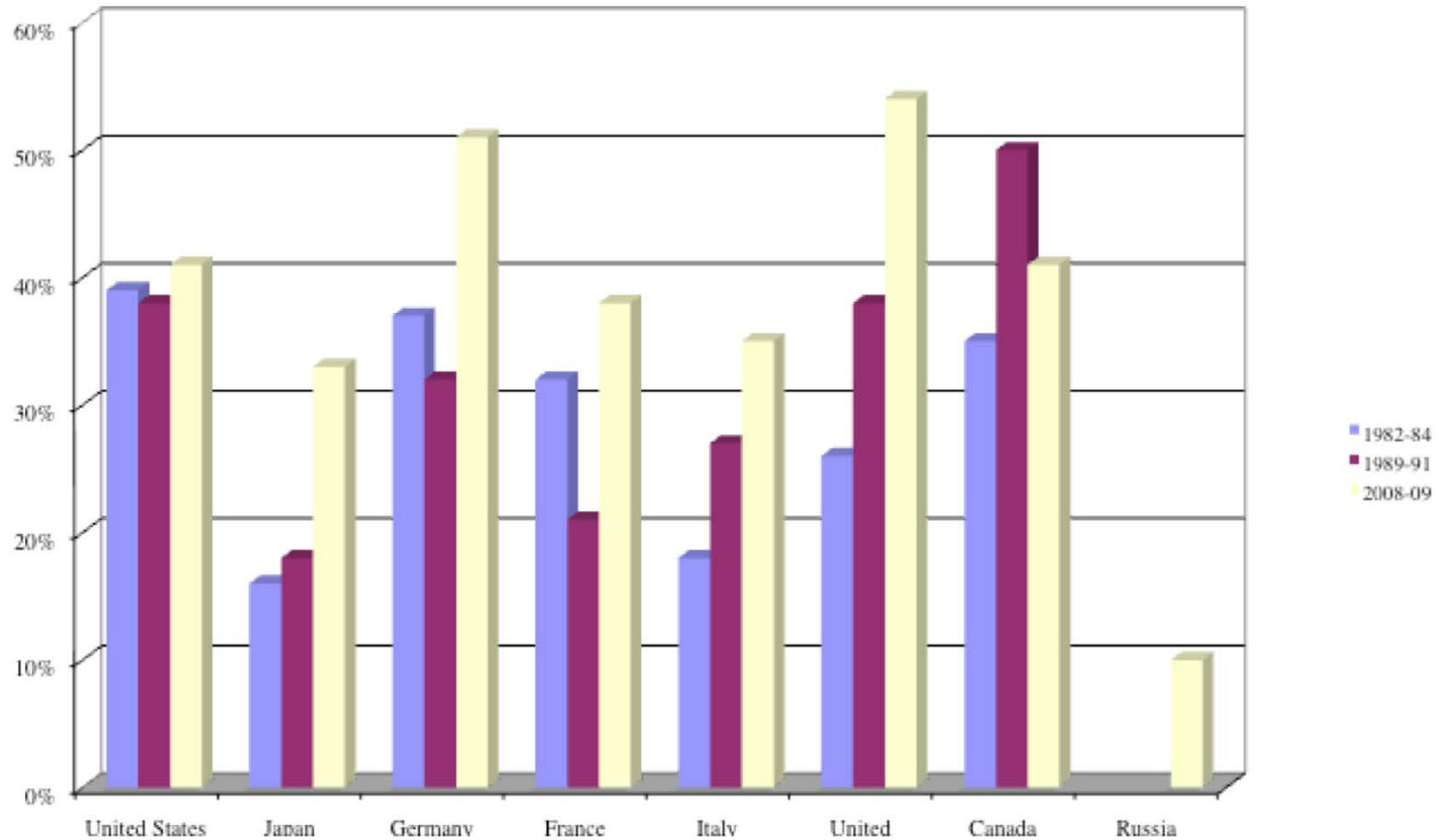
In the last quarter of 2012

- As the possibility of tax rates reverting back to pre-2003 levels rose, 233 companies paid out \$31 billion in dividends.
- Of these companies, 101 had insider holdings in excess of 20% of the outstanding stock.

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



V. And there are differences across countries...



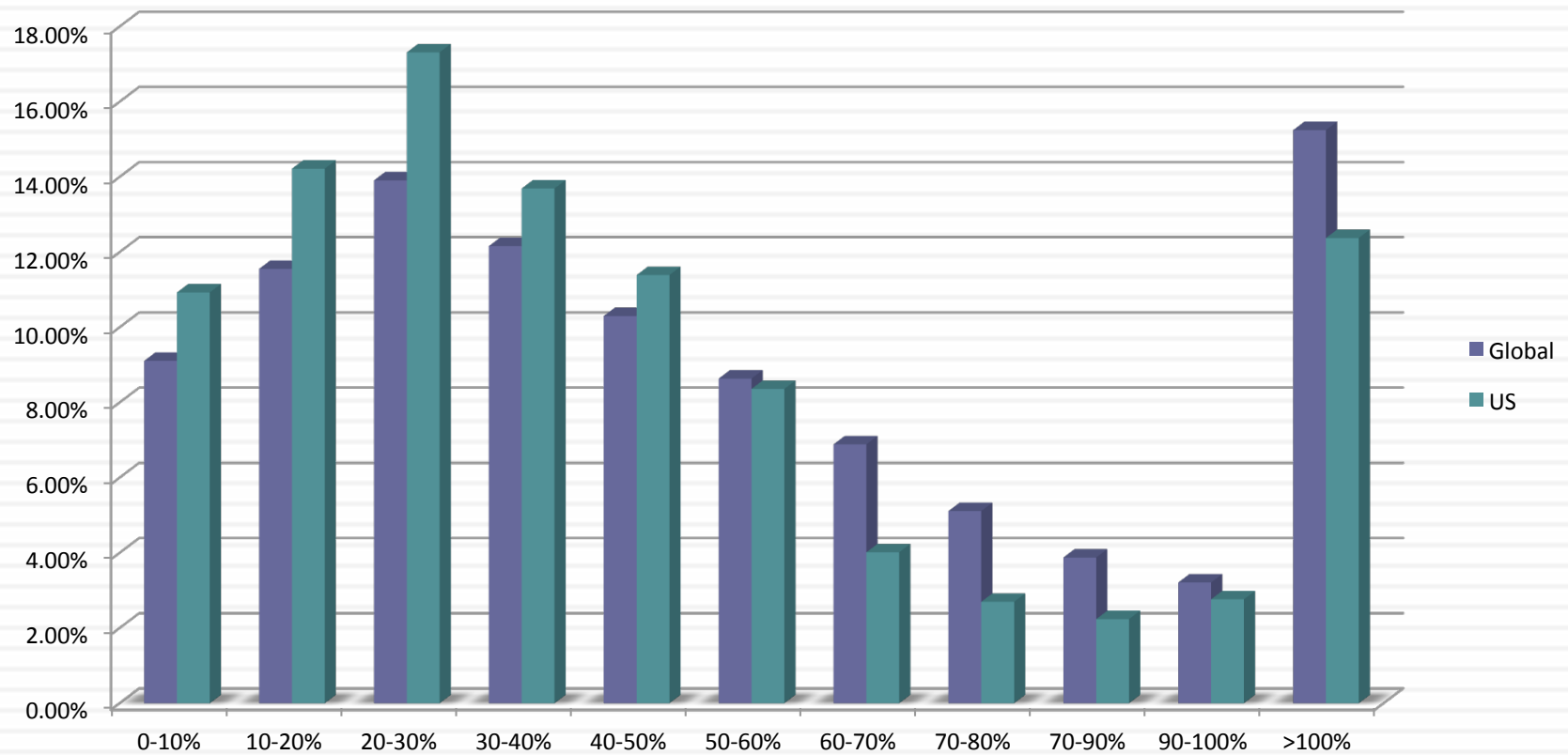
Measures of Dividend Policy

- Dividend Payout = Dividends/ Net Income
 - Measures the percentage of earnings that the company pays in dividends
 - If the net income is negative, the payout ratio cannot be computed.
- Dividend Yield = Dividends per share/ Stock price
 - Measures the return that an investor can make from dividends alone
 - Becomes part of the expected return on the investment.

B DES Page 3
PB Page 41-43

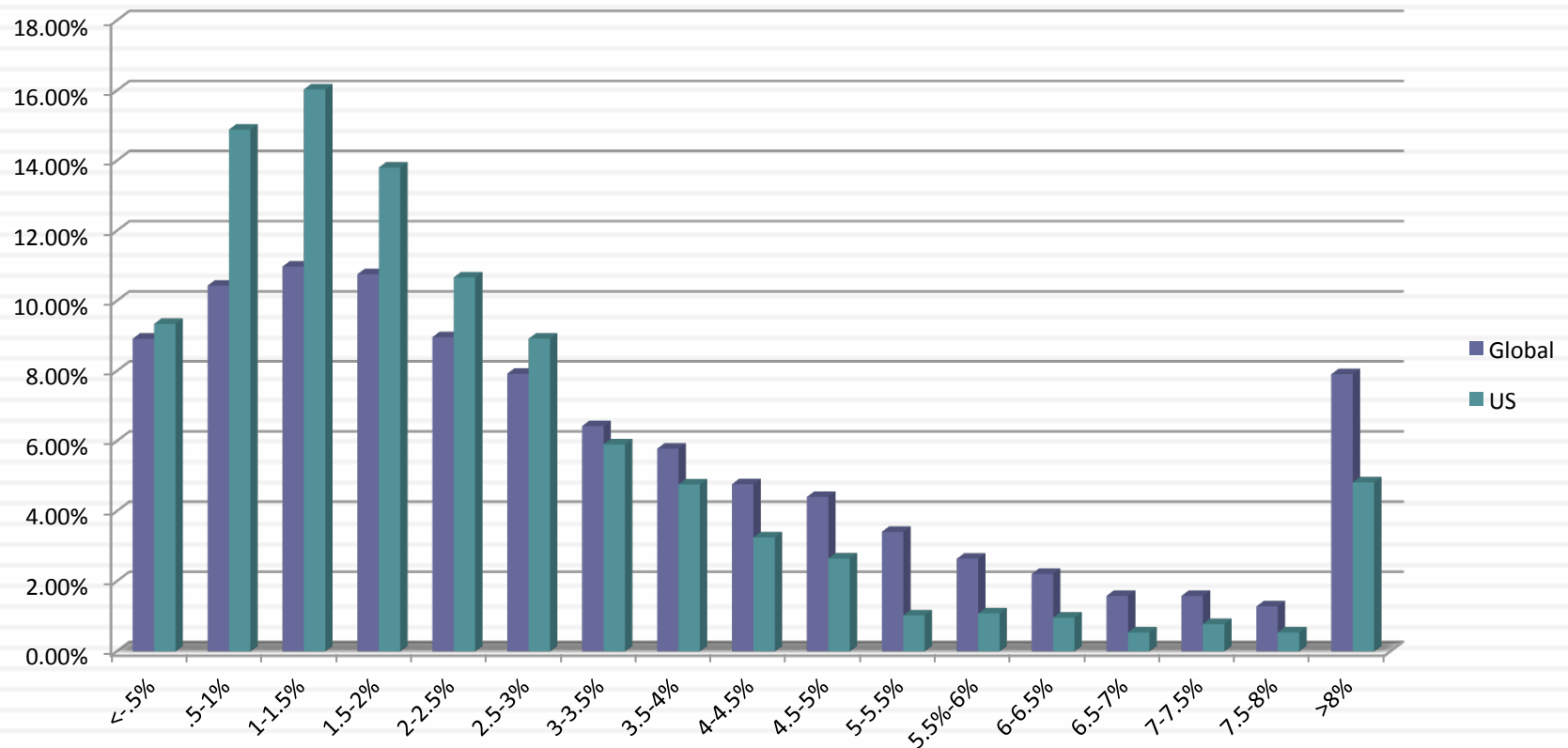
Dividend Payout Ratios

Dividend Payout Ratios in 2014



Dividend Yields

Dividend Yields in 2014



Three Schools Of Thought On Dividends

1. If there are no tax disadvantages associated with dividends & companies can issue stock, at no issuance cost, to raise equity, whenever needed

Dividends do not matter, and dividend policy does not affect value.

2. If dividends create a tax disadvantage for investors (relative to capital gains)

Dividends are bad, and increasing dividends will reduce value

3. If dividends create a tax advantage for investors (relative to capital gains) and/or stockholders like dividends

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: 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?

How much has the company returned to stockholders?

- As firms increasing use stock buybacks, we have to measure cash returned to stockholders as not only dividends but also buybacks.
- For instance, for the companies we are analyzing the cash returned looked as follows.

Year	<i>Disney</i>		<i>Yandex</i>	
	Dividends	Buybacks	Dividends	Buybacks
2009	\$648	\$648	0 RUB	0 RUB
2010	\$653	\$2,669	0 RUB	0 RUB
2011	\$756	\$4,993	0 RUB	0 RUB
2012	\$1,076	\$3,015	0 RUB	0 RUB
2013	\$1,324	\$4,087	0 RUB	0 RUB
2009-13	\$4,457	\$15,412	0 RUB	0 RUB

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

Disney's FCFE: 2009-2013

	2013	2012	2011	2010	2009	Aggregate
Net Income	\$6,136	\$5,682	\$4,807	\$3,963	\$3,307	\$23,895
- (Cap. Exp - Depr)	\$604	\$1,797	\$1,718	\$397	\$122	\$4,638
- Δ Working Capital	(\$133)	\$940	\$950	\$308	(\$109)	\$1,956
Free CF to Equity (pre-debt)	\$5,665	\$2,945	\$2,139	\$3,258	\$3,294	\$17,301
+ Net Debt Issued	\$1,881	\$4,246	\$2,743	\$1,190	(\$235)	\$9,825
= Free CF to Equity (actual debt)	\$7,546	\$7,191	\$4,882	\$4,448	\$3,059	\$27,126
Free CF to Equity (target debt ratio)	\$5,720	\$3,262	\$2,448	\$3,340	\$3,296	\$18,065
Dividends	\$1,324	\$1,076	\$756	\$653	\$648	\$4,457
Dividends + Buybacks	\$5,411	\$4,091	\$5,749	\$3,322	\$1,296	\$19,869

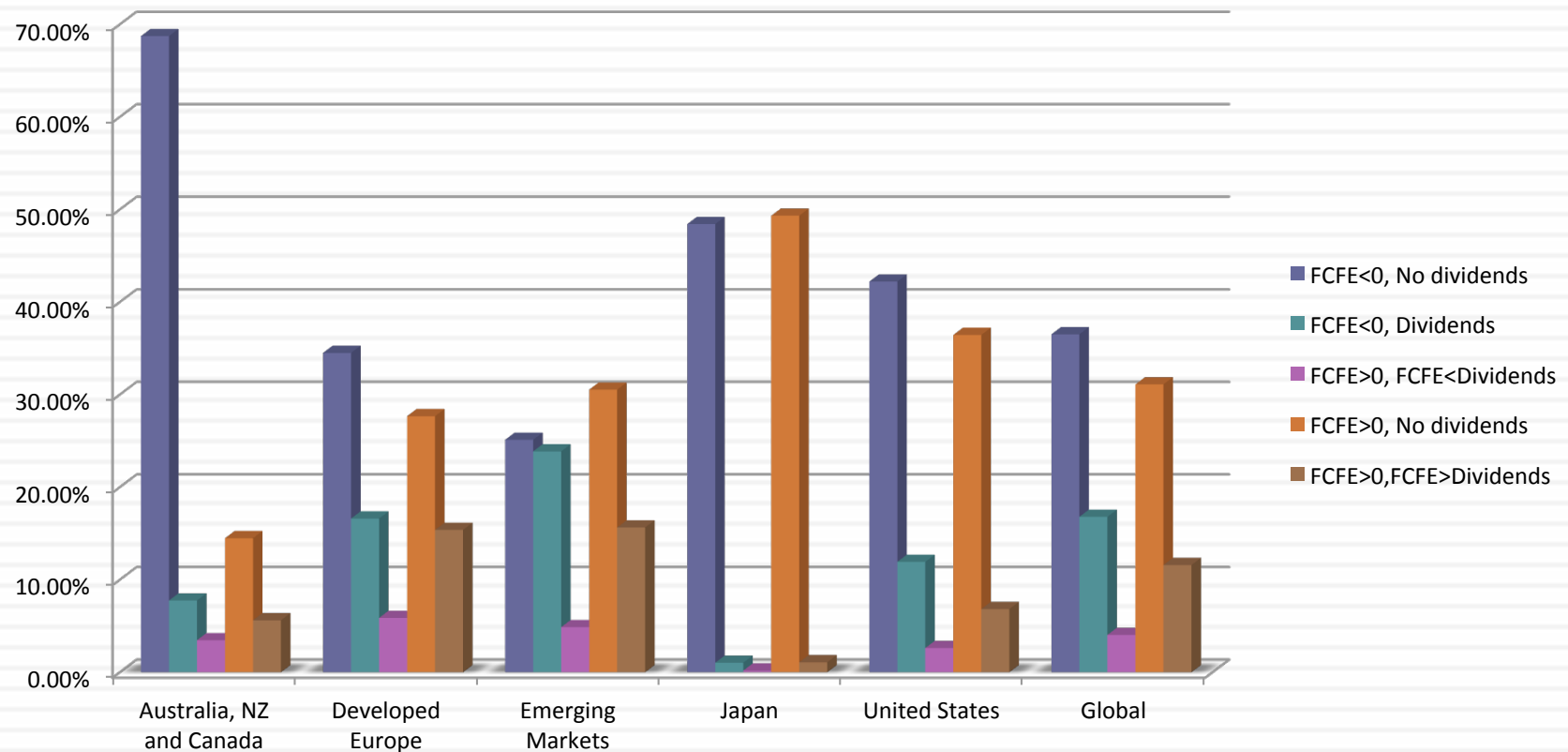
Disney returned about \$1.5 billion more than the \$18.1 billion it had available as FCFE with a normalized debt ratio of 11.58% (its current debt ratio).

Yandex FCFE: 2009-2013

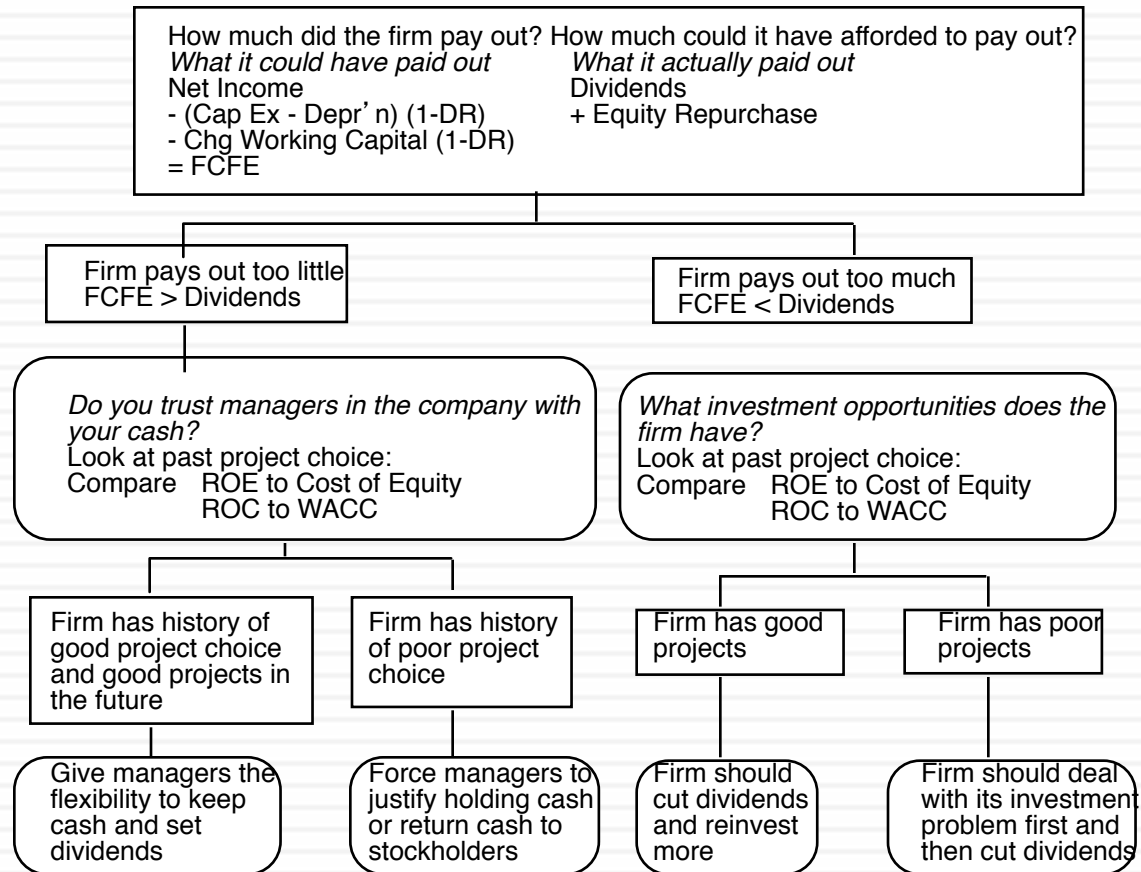
	1	2	3	4	5	Aggregate
Net Income	RUB 13,474	RUB 8,223	RUB 5,773	RUB 3,817	RUB 2,010	RUB 33,297
- (Cap. Exp - Depr)	RUB 3,679	RUB 1,033	RUB 4,391	RUB 1,253	RUB 307	RUB 10,663
- Δ Working Capital	RUB 1,142	RUB 162	RUB 544	RUB 638	RUB 494	RUB 716
Free CF to Equity (pre-debt)	RUB 8,653	RUB 7,028	RUB 838	RUB 3,202	RUB 2,197	RUB 21,918

Dividends versus FCFE: Across the globe

Figure 11.2: Dividends versus FCFE in 2014



A Practical Framework for Analyzing Dividend Policy



A Dividend Matrix

Quality of projects taken: ROE versus Cost of Equity

Poor projects

Good projects

Dividends paid out relative to FCFE
Cash Surplus
Cash Deficit

<p><i>Cash Surplus + Poor Projects</i> Significant pressure to pay out more to stockholders as dividends or stock buybacks</p>	<p><i>Cash Surplus + Good Projects</i> Maximum flexibility in setting dividend policy</p>
<p><i>Cash Deficit + Poor Projects</i> Cut out dividends but real problem is in investment policy.</p>	<p><i>Cash Deficit + Good Projects</i> Reduce cash payout, if any, to stockholders</p>

Case 1: Disney in 2003

□ FCFE versus Dividends

- Between 1994 & 2003, Disney generated \$969 million in FCFE each year.
- Between 1994 & 2003, Disney paid out \$639 million in dividends and stock buybacks each year.

□ Cash Balance

- Disney had a cash balance in excess of \$ 4 billion at the end of 2003.

□ Performance measures

- Between 1994 and 2003, Disney has generated a return on equity, on it's projects, about 2% less than the cost of equity, on average each year.
- Between 1994 and 2003, Disney's stock has delivered about 3% less than the cost of equity, on average each year.
- The underperformance has been primarily post 1996 (after the Capital Cities acquisition).

Can you trust Disney's management?

- Given Disney's track record between 1994 and 2003, if you were a Disney stockholder, would you be comfortable with Disney's dividend policy?
 - a. Yes
 - b. No
- Does the fact that the company is run by Michael Eisner, the CEO for the last 10 years and the initiator of the Cap Cities acquisition have an effect on your decision.
 - a. Yes
 - b. No

Following up: Disney in 2009

- Between 2004 and 2008, Disney made significant changes:
 - It replaced its CEO, Michael Eisner, with a new CEO, Bob Iger, who at least on the surface seemed to be more receptive to stockholder concerns.
 - Its stock price performance improved (positive Jensen's alpha)
 - Its project choice improved (ROC moved from being well below cost of capital to above)
- The firm also shifted from cash returned $<$ FCFE to cash returned $>$ FCFE and avoided making large acquisitions.
- If you were a stockholder in 2009 and Iger made a plea to retain cash in Disney to pursue investment opportunities, would you be more receptive?
 - a. Yes
 - b. No

Final twist: Disney in 2013

- Disney did return to holding cash between 2008 and 2013, with dividends and buybacks amounting TO \$2.6 billion less than the FCFE (with a target debt ratio) over this period.
- Disney continues to earn a return on capital well in excess of the cost of capital and its stock has doubled over the last two years.
- Now, assume that Bob Iger asks you for permission to withhold even more cash to cover future investment needs. Are you likely to go along?
 - a. Yes
 - b. No

Case 2: Yandex

- Yandex has been accumulating cash for the last few years. Do you trust Yandex's management with your cash?
 - a. Yes
 - b. No
- If yes, why? What may cause your trust to shift?
- If no, why not? What do you plan to do to try to get the cash out of the company?

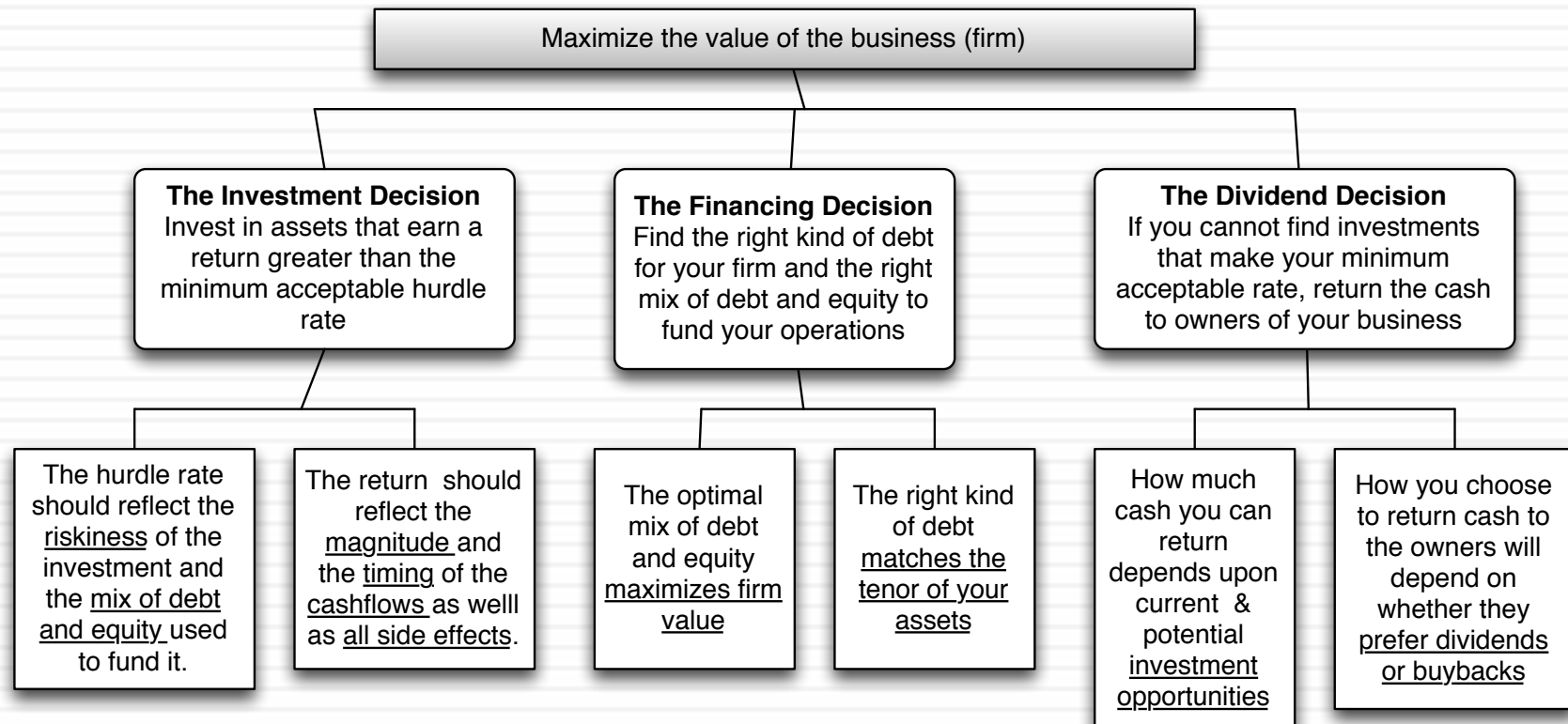
Aswath Damodaran



VALUATION

Cynic: A person who knows the price of everything but the value of nothing..
Oscar Wilde

First Principles



Three approaches to valuation

1. Intrinsic valuation: The value of an asset is a function of its fundamentals – cash flows, growth and risk. In general, discounted cash flow models are used to estimate intrinsic value.
2. Relative valuation: The value of an asset is estimated based upon what investors are paying for similar assets. In general, this takes the form of value or price multiples and comparing firms within the same business.
3. Contingent claim valuation: When the cash flows on an asset are contingent on an external event, the value can be estimated using option pricing models.

Intrinsic Value: Four Basic Propositions

138

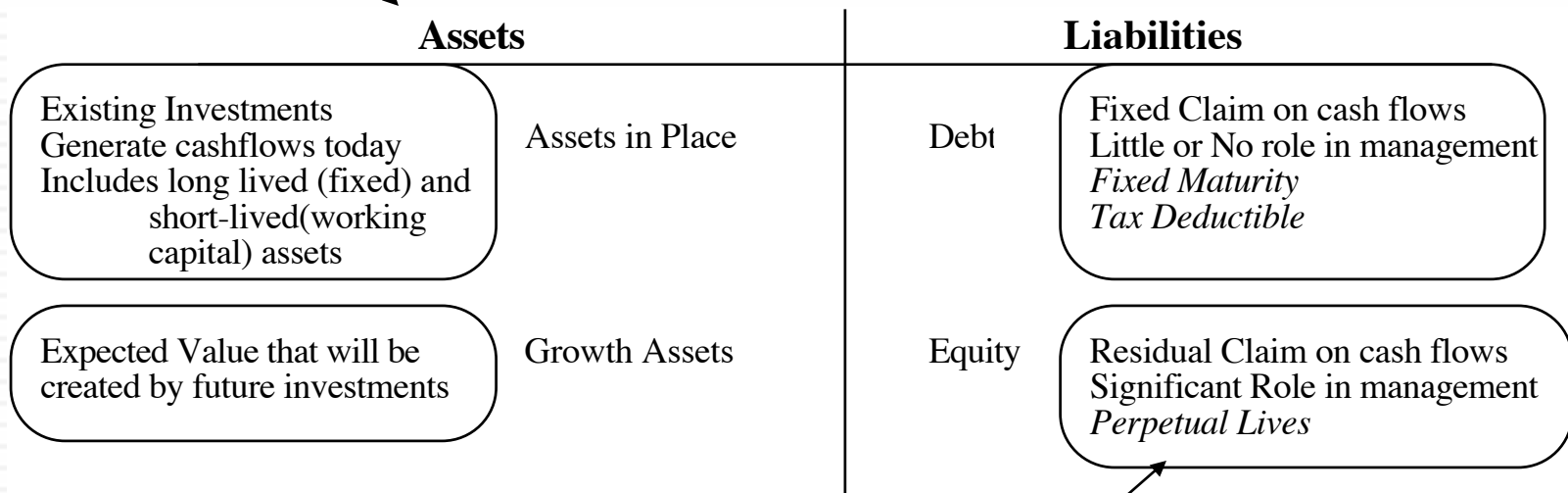
The value of an asset is the present value of the expected cash flows on that asset, over its expected life:

$$\text{Value of asset} = \frac{E(\text{CF}_1)}{(1+r)} + \frac{E(\text{CF}_2)}{(1+r)^2} + \frac{E(\text{CF}_3)}{(1+r)^3} \dots + \frac{E(\text{CF}_n)}{(1+r)^n}$$

1. *The IT Proposition:* If “it” does not affect the cash flows or alter risk (thus changing discount rates), “it” cannot affect value.
2. *The DUH Proposition:* For an asset to have value, the expected cash flows have to be positive some time over the life of the asset.
3. *The DON'T FREAK OUT Proposition:* Assets that generate cash flows early in their life will be worth more than assets that generate cash flows later; the latter may however have greater growth and higher cash flows to compensate.
4. *The VALUE IS NOT PRICE Proposition:* The value of an asset may be very different from its price.

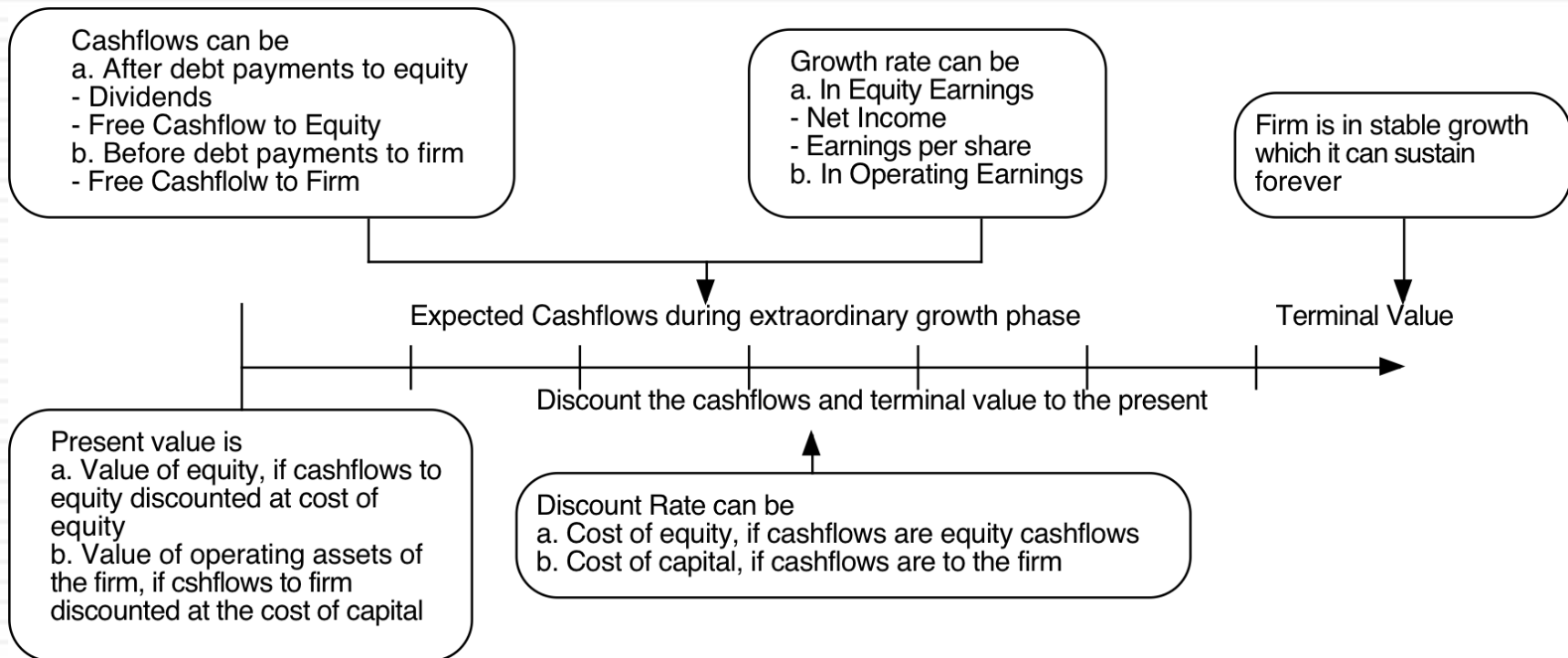
DCF Choices: Equity Valuation versus Firm Valuation

Firm Valuation: Value the entire business

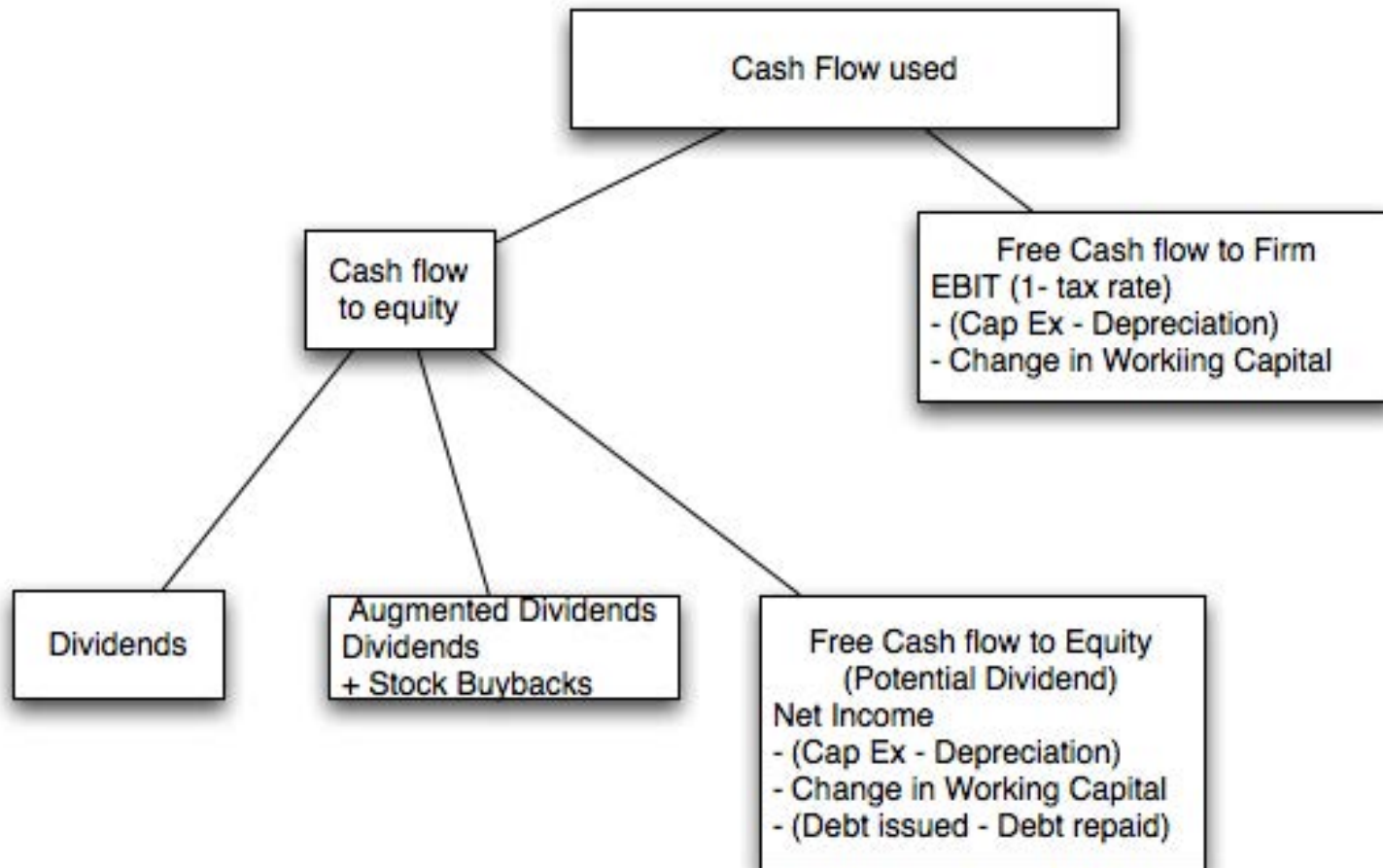


Equity valuation: Value just the equity claim in the business

The Ingredients that determine value.



I. Estimating Cash Flows



Estimating FCFF: Disney

- In the fiscal year ended September 2013, Disney reported the following:
 - ▣ Operating income (adjusted for leases) = \$10,032 million
 - ▣ Effective tax rate = 31.02%
 - ▣ Capital Expenditures (including acquisitions) = \$5,239 million
 - ▣ Depreciation & Amortization = \$2,192 million
 - ▣ Change in non-cash working capital = \$103 million
- The free cash flow to the firm can be computed as follows:

After-tax Operating Income	=	10,032 (1 - .3102)	=	\$6,920
- Net Cap Expenditures	=	\$5,239 - \$2,192	=	\$3,629
- Change in Working Capital	=		=	\$103
= Free Cashflow to Firm (FCFF)	=		=	\$3,188
- The reinvestment and reinvestment rate are as follows:
 - ▣ Reinvestment = \$3,629 + \$103 = \$3,732 million
 - ▣ Reinvestment Rate = \$3,732 / \$6,920 = 53.93%

II. Discount Rates

- Keep it current: When doing a valuation, you need a discount rate that reflects today's conditions. Not only does this require you to update the base risk free rate, but also your risk premiums (equity risk premium and default spread) and perhaps even your measures of risk (betas, default risk measures)
- Keep it consistent: At an intuitive level, the discount rate used should be consistent with both the riskiness and the type of cash flow being discounted. The cost of equity is the rate at which we discount cash flows to equity (dividends or free cash flows to equity). The cost of capital is the rate at which we discount free cash flows to the firm.
- Keep it in perspective: The discount rate obviously matters in a discounted cash flow valuation, but not as much as your other inputs. In fact, as uncertainty about the future increases, the more you should focus on estimating cash flows and the less you should focus on discount rates.

Current Cost of Capital: Disney

- The beta for Disney's stock in November 2013 was 1.0013. The T. bond rate at that time was 2.75%. Using an estimated equity risk premium of 5.76%, we estimated the cost of equity for Disney to be 8.52%:

$$\text{Cost of Equity} = 2.75\% + 1.0013(5.76\%) = 8.52\%$$

- Disney's bond rating in May 2009 was A, and based on this rating, the estimated pretax cost of debt for Disney is 3.75%. Using a marginal tax rate of 36.1, the after-tax cost of debt for Disney is 2.40%.

$$\text{After-Tax Cost of Debt} = 3.75\% (1 - 0.361) = 2.40\%$$

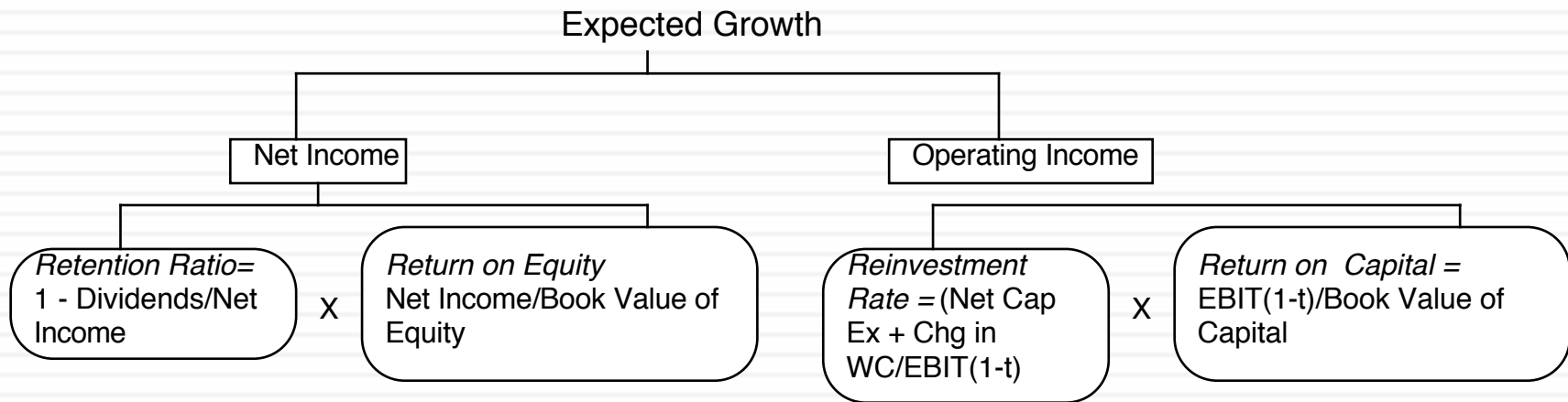
- The cost of capital was calculated using these costs and the weights based on market values of equity (121,878) and debt (15,961):

$$\text{Cost of capital} = 8.52\% \frac{121,878}{(15,961+121,878)} + 2.40\% \frac{15,961}{(15,961+121,878)} = 7.81\%$$

But costs of equity and capital can and should change over time...

Year	Beta	Cost of Equity	After-tax Cost of Debt	Debt Ratio	Cost of capital
1	1.0013	8.52%	2.40%	11.50%	7.81%
2	1.0013	8.52%	2.40%	11.50%	7.81%
3	1.0013	8.52%	2.40%	11.50%	7.81%
4	1.0013	8.52%	2.40%	11.50%	7.81%
5	1.0013	8.52%	2.40%	11.50%	7.81%
6	1.0010	8.52%	2.40%	13.20%	7.71%
7	1.0008	8.51%	2.40%	14.90%	7.60%
8	1.0005	8.51%	2.40%	16.60%	7.50%
9	1.0003	8.51%	2.40%	18.30%	7.39%
10	1.0000	8.51%	2.40%	20.00%	7.29%

III. Expected Growth



Estimating Growth in EBIT: Disney

- We started with the reinvestment rate that we computed from the 2013 financial statements:

$$\text{Reinvestment rate} = \frac{(3,629 + 103)}{10,032 (1-.3102)} = 53.93\%$$

We computed the reinvestment rate in prior years to ensure that the 2013 values were not unusual or outliers.

- We compute the return on capital, using operating income in 2013 and capital invested at the start of the year:

$$\text{Return on Capital}_{2013} = \frac{\text{EBIT} (1-t)}{(\text{BV of Equity} + \text{BV of Debt} - \text{Cash})} = \frac{10,032 (1-.361)}{(41,958 + 16,328 - 3,387)} = 12.61\%$$

Disney's return on capital has improved gradually over the last decade and has levelled off in the last two years.

- If Disney maintains its 2013 reinvestment rate and return on capital for the next five years, its growth rate will be 6.80 percent.

$$\text{Expected Growth Rate from Existing Fundamentals} = 53.93\% * 12.61\% = 6.8\%$$

IV. Getting Closure in Valuation

- Since we cannot estimate cash flows forever, we estimate cash flows for a “growth period” and then estimate a terminal value, to capture the value at the end of the period:

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

- When a firm’s cash flows grow at a “constant” rate forever, the present value of those cash flows can be written as:
 - ▣ Value = Expected Cash Flow Next Period / (r - g)
 - ▣ where,
 - r = Discount rate (Cost of Equity or Cost of Capital)
 - g = Expected growth rate forever.
- This “constant” growth rate is called a stable growth rate and cannot be higher than the growth rate of the economy in which the firm operates.

Getting to stable growth...

- A key assumption in all discounted cash flow models is the period of high growth, and the pattern of growth during that period. In general, we can make one of three assumptions:
 - there is no high growth, in which case the firm is already in stable growth
 - there will be high growth for a period, at the end of which the growth rate will drop to the stable growth rate (2-stage)
 - there will be high growth for a period, at the end of which the growth rate will decline gradually to a stable growth rate(3-stage)
- The assumption of how long high growth will continue will depend upon several factors including:
 - the size of the firm (larger firm -> shorter high growth periods)
 - current growth rate (if high -> longer high growth period)
 - barriers to entry and differential advantages (if high -> longer growth period)

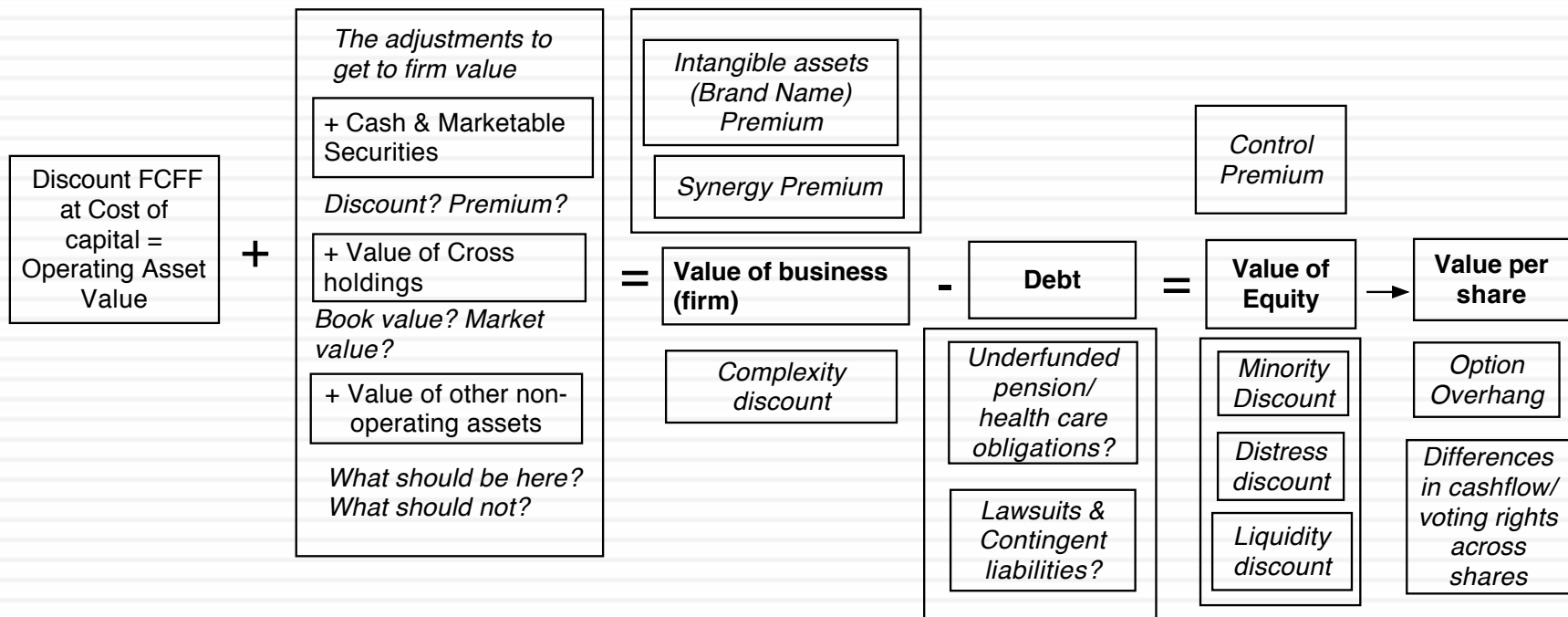
Estimating Stable Period Inputs: Disney

- Respect the cap: The growth rate forever is assumed to be 2.5. This is set lower than the riskfree rate (2.75%).
- Stable period excess returns: The return on capital for Disney will drop from its high growth period level of 12.61% to a stable growth return of 10%. This is still higher than the cost of capital of 7.29% but the competitive advantages that Disney has are unlikely to dissipate completely by the end of the 10th year.
- Reinvest to grow: Based on the expected growth rate in perpetuity (2.5%) and expected return on capital forever after year 10 of 10%, we compute a stable period reinvestment rate of 25%:
 - Reinvestment Rate = Growth Rate / Return on Capital = 2.5% / 10% = 25%
- Adjust risk and cost of capital: The beta for the stock will drop to one, reflecting Disney's status as a mature company.
 - Cost of Equity = Riskfree Rate + Beta * Risk Premium = 2.75% + 5.76% = 8.51%
 - The debt ratio for Disney will rise to 20%. Since we assume that the cost of debt remains unchanged at 3.75%, this will result in a cost of capital of 7.29%
 - Cost of capital = 8.51% (.80) + 3.75% (1-.361) (.20) = 7.29%

V. From firm value to equity value per share

Approach used	To get to equity value per share
Discount dividends per share at the cost of equity	Present value is value of equity per share
Discount aggregate FCFE at the cost of equity	Present value is value of aggregate equity. Subtract the value of equity options given to managers and divide by number of shares.
Discount aggregate FCFF at the cost of capital	$ \begin{aligned} &PV = \text{Value of operating assets} \\ &+ \text{Cash \& Near Cash investments} \\ &+ \text{Value of minority cross holdings} \\ &- \text{Debt outstanding} \\ &= \text{Value of equity} \\ &- \text{Value of equity options} \\ &= \text{Value of equity in common stock} \\ &/ \text{Number of shares} \end{aligned} $

Getting from DCF to value per share: The Loose Ends



1. The Value of Cash

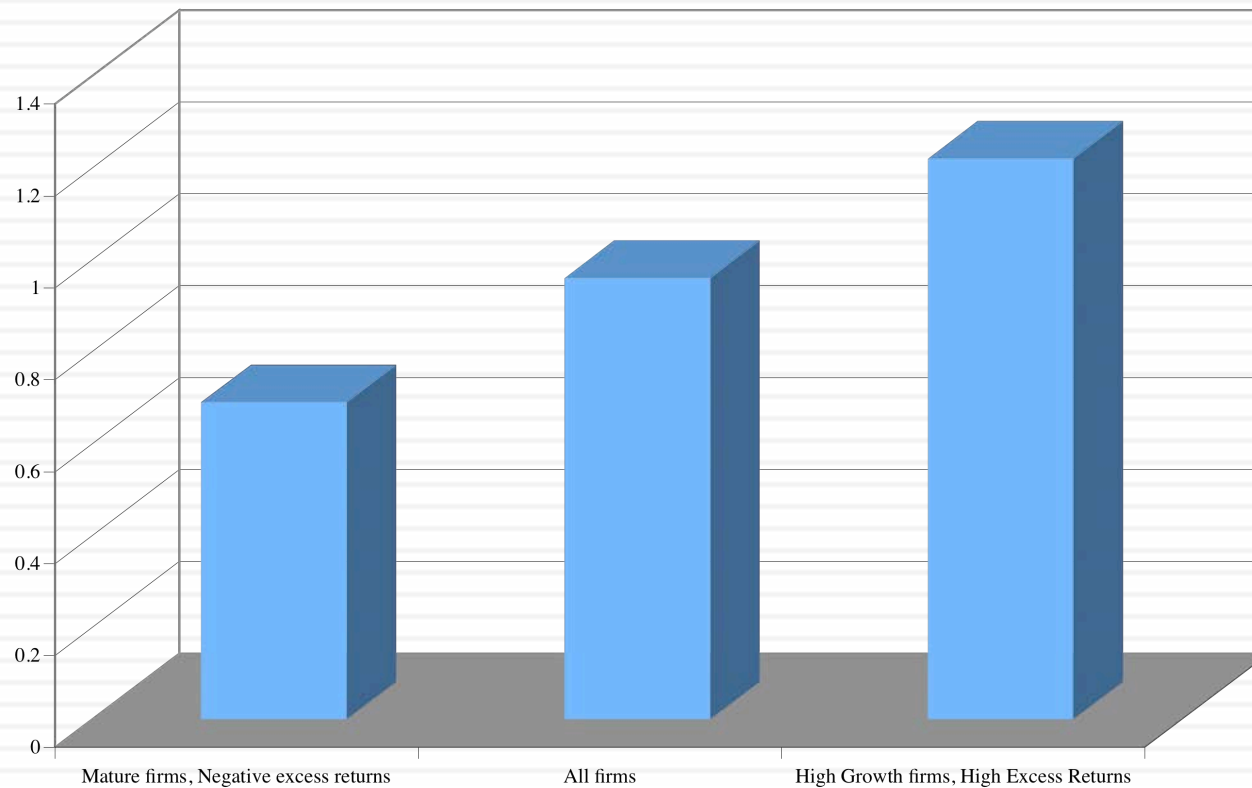
An Exercise in Cash Valuation

	Company A	Company B	Company C
Enterprise Value	\$ 1 billion	\$ 1 billion	\$ 1 billion
Cash	\$ 100 mil	\$ 100 mil	\$ 100 mil
Return on Capital	10%	5%	22%
Cost of Capital	10%	10%	12%
Trades in	US	US	Argentina

- In which of these companies is cash most likely to trade at face value, at a discount and at a premium?

Cash: Discount or Premium?

*Market Value of \$ 1 in cash:
Estimates obtained by regressing Enterprise Value against Cash Balances*



2. Dealing with Holdings in Other firms

- Holdings in other firms can be categorized into
 - ▣ Minority passive holdings, in which case only the dividend from the holdings is shown in the balance sheet
 - ▣ Minority active holdings, in which case the share of equity income is shown in the income statements
 - ▣ Majority active holdings, in which case the financial statements are consolidated.
- We tend to be sloppy in practice in dealing with cross holdings. After valuing the operating assets of a firm, using consolidated statements, it is common to add on the balance sheet value of minority holdings (which are in book value terms) and subtract out the minority interests (again in book value terms), representing the portion of the consolidated company that does not belong to the parent company.

How to value holdings in other firms.. In a perfect world..

- In a perfect world, we would strip the parent company from its subsidiaries and value each one separately. The value of the combined firm will be
 - ▣ Value of parent company + Proportion of value of each subsidiary
- To do this right, you will need to be provided detailed information on each subsidiary to estimate cash flows and discount rates.

Two compromise solutions...

- The market value solution: When the subsidiaries are publicly traded, you could use their traded market capitalizations to estimate the values of the cross holdings. You do risk carrying into your valuation any mistakes that the market may be making in valuation.
- The relative value solution: When there are too many cross holdings to value separately or when there is insufficient information provided on cross holdings, you can convert the book values of holdings that you have on the balance sheet (for both minority holdings and minority interests in majority holdings) by using the average price to book value ratio of the sector in which the subsidiaries operate.

3. Other Assets that have not been counted yet..

- Unutilized assets: If you have assets or property that are not being utilized (vacant land, for example), you have not valued it yet. You can assess a market value for these assets and add them on to the value of the firm.
- Overfunded pension plans: If you have a defined benefit plan and your assets exceed your expected liabilities, you could consider the over funding with two caveats:
 - Collective bargaining agreements may prevent you from laying claim to these excess assets.
 - There are tax consequences. Often, withdrawals from pension plans get taxed at much higher rates.
- **Do not double count an asset.** If you count the income from an asset in your cash flows, you cannot count the market value of the asset in your value.

Disney: Inputs to Valuation

	<i>High Growth Phase</i>	<i>Transition Phase</i>	<i>Stable Growth Phase</i>
Length of Period	5 years	5 years	Forever after 10 years
Tax Rate	31.02% (Effective) 36.1% (Marginal)	31.02% (Effective) 36.1% (Marginal)	31.02% (Effective) 36.1% (Marginal)
Return on Capital	12.61%	Declines linearly to 10%	Stable ROC of 10%
Reinvestment Rate	53.93% (based on normalized acquisition costs)	Declines gradually to 25% as ROC and growth rates drop:	25% of after-tax operating income. Reinvestment rate = g/ROC $= 2.5/10=25\%$
Expected Growth Rate in EBIT	$ROC * Reinvestment Rate = 0.1261 * .5393 = .068$ or 6.8%	Linear decline to Stable Growth Rate of 2.5%	2.5%
Debt/Capital Ratio	11.5%	Rises linearly to 20.0%	20%
Risk Parameters	Beta = 1.0013, $k_c = 8.52\%$ Pre-tax Cost of Debt = 3.75% Cost of capital = 7.81%	Beta changes to 1.00; Cost of debt stays at 3.75% Cost of capital declines gradually to 7.29%	Beta = 1.00; $k_c = 8.51\%$ Cost of debt stays at 3.75% Cost of capital = 7.29%

Disney - November 2013

Current Cashflow to Firm
 EBIT(1-t) = 10,032(1-.31) = 6,920
 - (Cap Ex - Deprecn) 3,629
 - Chg Working capital 103
 = FCFF 3,188
 Reinvestment Rate = 3,732/6920 = 53.93%
 Return on capital = 12.61%

Reinvestment Rate
53.93%

Return on Capital
12.61%

Expected Growth
 $.5393 \times .1261 = .068$ or 6.8%

Stable Growth
 g = 2.75%; Beta = 1.00;
 Debt % = 20%; k(debt) = 3.75
 Cost of capital = 7.29%
 Tax rate = 36.1%; ROC = 10%;
 Reinvestment Rate = 2.5/10 = 25%

Terminal Value₁₀ = 7,980 / (.0729 - .025) = 165,323

First 5 years

Growth declines gradually to 2.75%

	1	2	3	4	5	6	7	8	9	10
EBIT * (1 - tax rate)	\$7,391	\$7,893	\$8,430	\$9,003	\$9,615	\$10,187	\$10,704	\$11,156	\$11,531	\$11,819
- Reinvestment	\$3,985	\$4,256	\$4,546	\$4,855	\$5,185	\$4,904	\$4,534	\$4,080	\$3,550	\$2,955
FCFF	\$3,405	\$3,637	\$3,884	\$4,148	\$4,430	\$5,283	\$6,170	\$7,076	\$7,981	\$8,864

Term Yr
10,639
2,660
7,980

Op. Assets 125,477
 + Cash: 3,931
 + Non op inv 2,849
 - Debt 15,961
 - Minority Int 2,721
 = Equity 113,575
 - Options 972
Value/Share \$ 62.56

Cost of Capital (WACC) = 8.52% (0.885) + 2.40% (0.115) = 7.81%

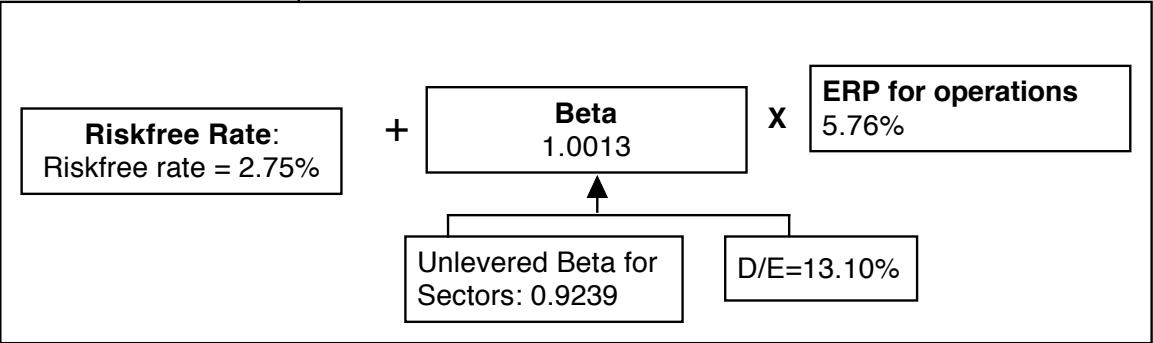
Cost of capital declines gradually to 7.29%

Cost of Equity
8.52%

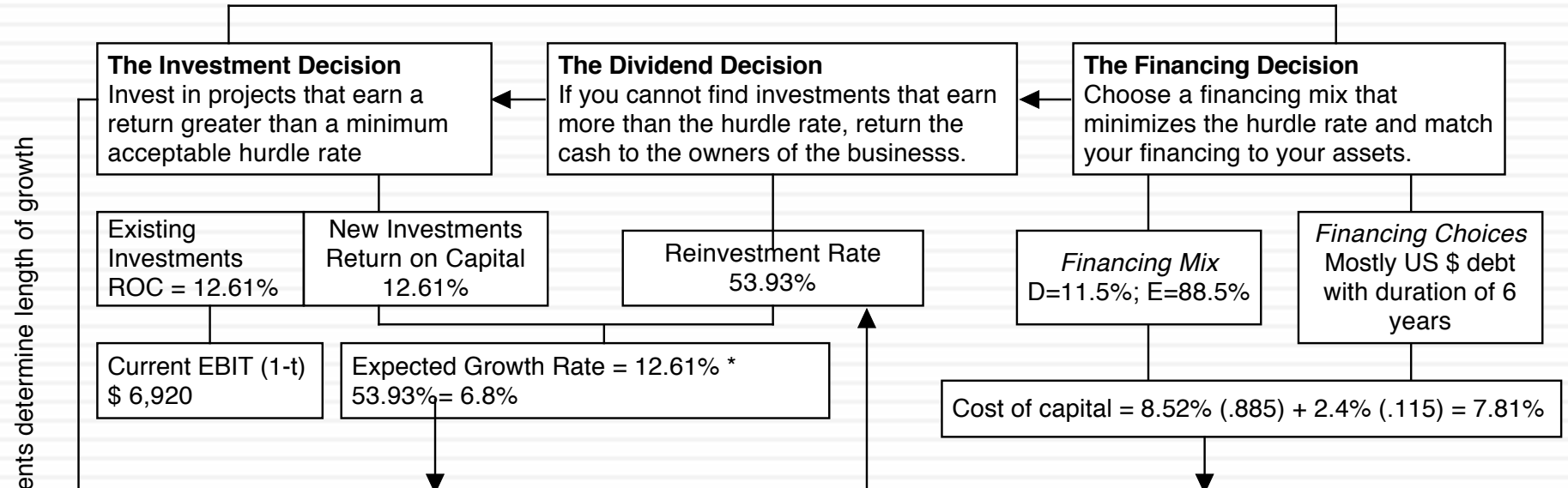
Cost of Debt
 $(2.75\% + 1.00\%)(1 - .361) = 2.40\%$
 Based on actual A rating

Weights
 E = 88.5% D = 11.5%

In November 2013, Disney was trading at \$67.71/share



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



Strategic investments determine length of growth period

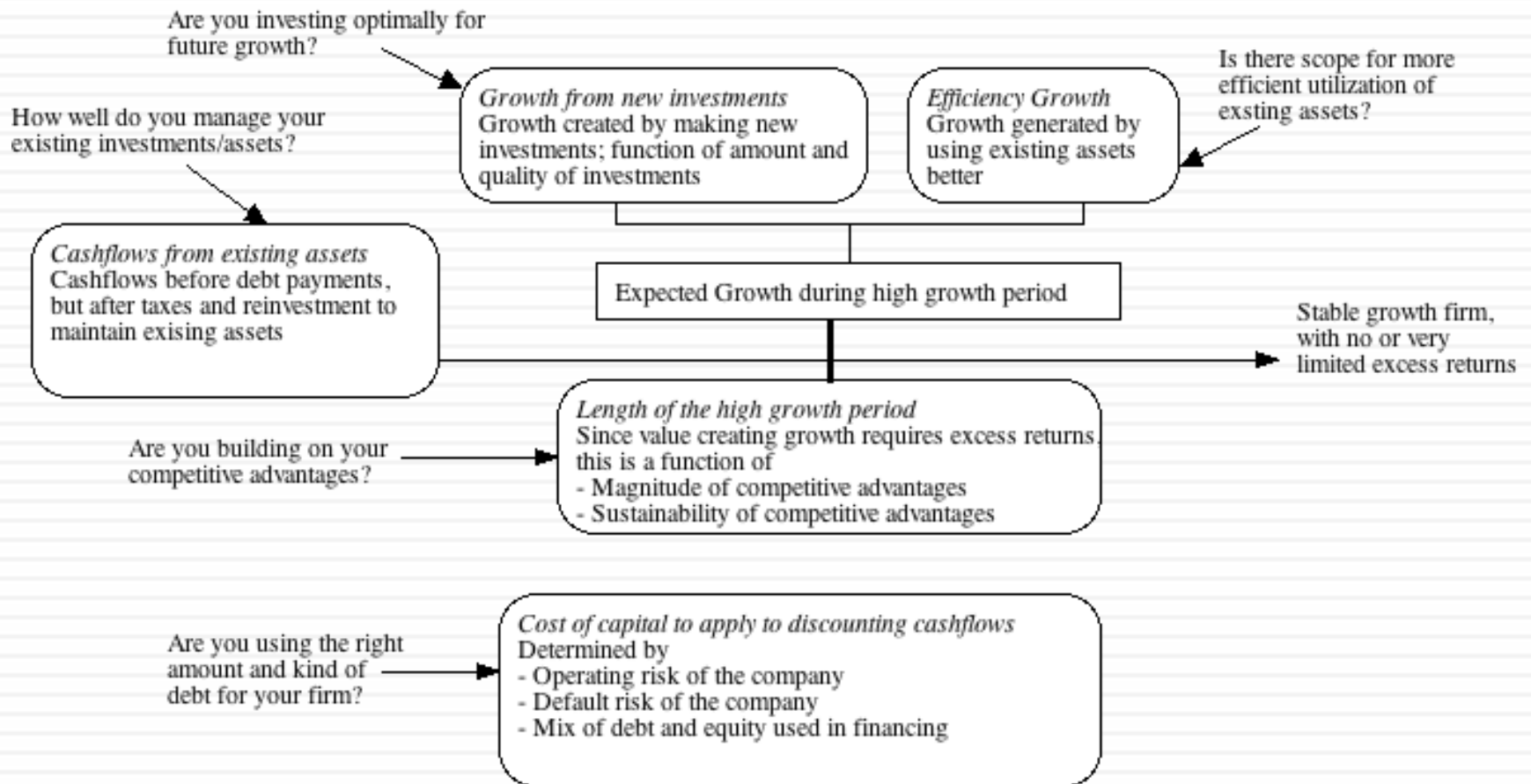
Year	Expected Growth	EBIT (1-t)	Reinvestment	FCFF	Terminal Value	Cost of capital	PV
1	6.80%	\$7,391	\$3,985	\$3,405		7.81%	\$3,158
2	6.80%	\$7,893	\$4,256	\$3,637		7.81%	\$3,129
3	6.80%	\$8,430	\$4,546	\$3,884		7.81%	\$3,099
4	6.80%	\$9,003	\$4,855	\$4,148		7.81%	\$3,070
5	6.80%	\$9,615	\$5,185	\$4,430		7.81%	\$3,041
6	5.94%	\$10,187	\$4,904	\$5,283		7.71%	\$3,367
7	5.08%	\$10,704	\$4,534	\$6,170		7.60%	\$3,654
8	4.22%	\$11,156	\$4,080	\$7,076		7.50%	\$3,899
9	3.36%	\$11,531	\$3,550	\$7,981		7.39%	\$4,094
10	2.50%	\$11,819	\$2,955	\$8,864	\$189,738	7.29%	\$94,966

Value of operating assets of the firm =	\$125,477
Value of Cash & Non-operating assets =	\$6,780
Value of Firm =	\$132,257
Market Value of outstanding debt =	\$15,961
Minority Interests	\$2,721
Market Value of Equity =	\$113,575
Value of Equity in Options =	\$972
Value of Equity in Common Stock =	\$112,603
Market Value of Equity/share =	\$62.56

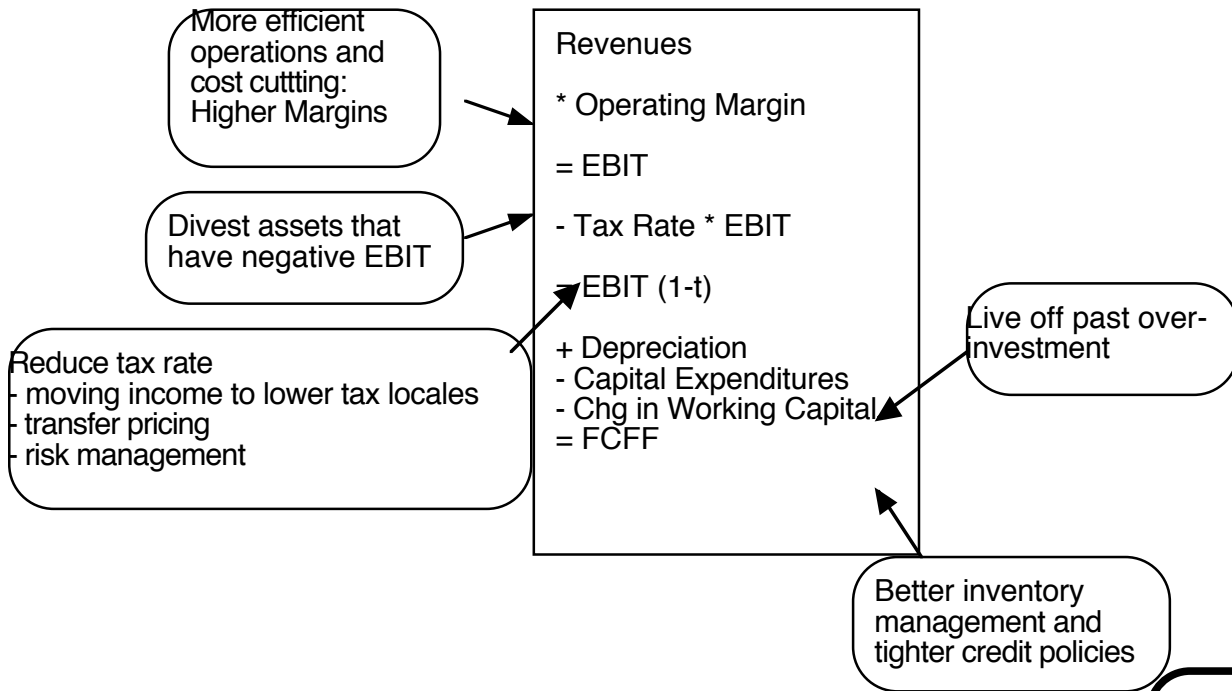
Aswath Damodaran

Disney: Corporate Financing Decisions and Firm Value

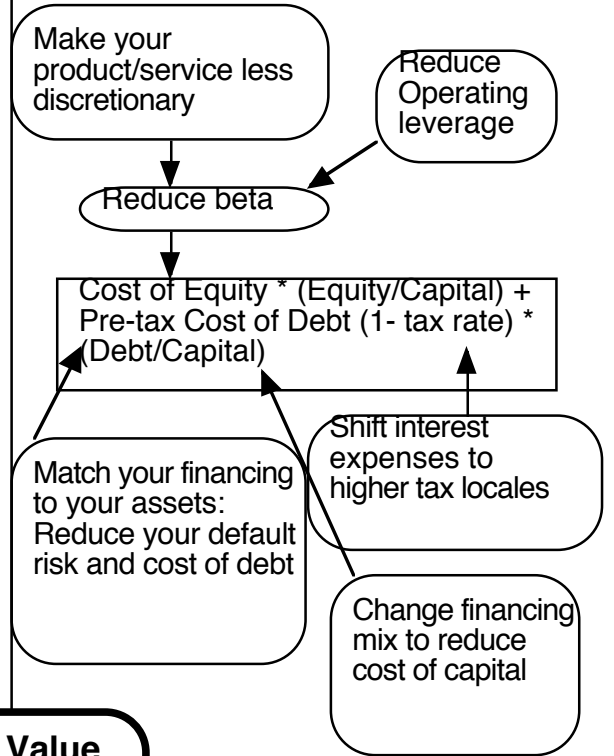
If your job is enhancing value, it's got to come from changing the fundamentals



Increase Cash Flows

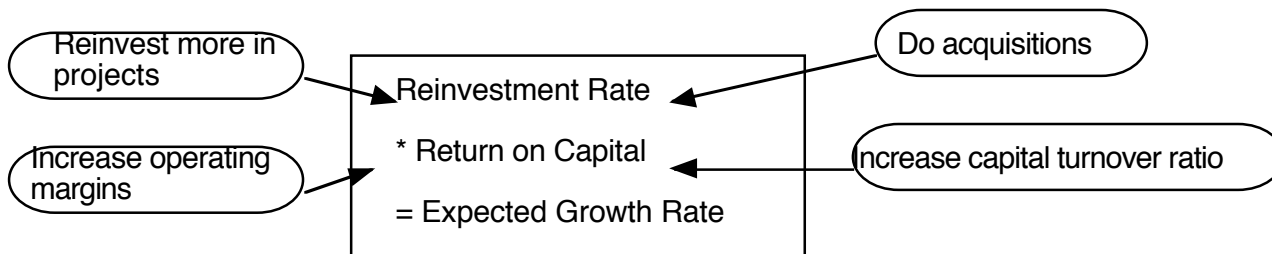


Reduce the cost of capital

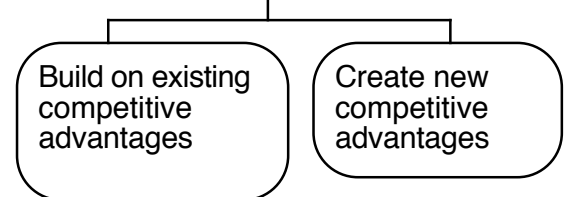


Firm Value

Increase Expected Growth



Increase length of growth period



Disney (Restructured)- November 2013

Current Cashflow to Firm
 EBIT(1-t)= 10,032(1-.31)= 6,920
 - (Cap Ex - Deprecn) 3,629
 - Chg Working capital 103
 = FCFF 3,188
 Reinvestment Rate = 3,732/6920
 =53.93%
 Return on capital = 12.61%

Reinvestment Rate
50.00%

More selective acquisitions & payoff from gaming

Return on Capital
14.00%

Expected Growth
.50* .14 = .07 or 7%

Stable Growth
 g = 2.75%; Beta = 1.20;
 Debt %= 40%; k(debt)=3.75%
 Cost of capital =6.76%
 Tax rate=36.1%; ROC= 10%;
 Reinvestment Rate=2.5/10=25%

Op. Assets 147,704
 + Cash: 3,931
 + Non op inv 2,849
 - Debt 15,961
 - Minority Int 2,721
 =Equity 135,802
 -Options 869
Value/Share \$ 74.96

	First 5 years					Growth declines gradually to 2.75%				
	1	2	3	4	5	6	7	8	9	10
EBIT * (1 - tax rate)	\$7,404	\$7,923	\$8,477	\$9,071	\$9,706	\$10,298	\$10,833	\$11,299	\$11,683	\$11,975
- Reinvestment	\$3,702	\$3,961	\$4,239	\$4,535	\$4,853	\$4,634	\$4,333	\$3,955	\$3,505	\$2,994
Free Cashflow to Firm	\$3,702	\$3,961	\$4,239	\$4,535	\$4,853	\$5,664	\$6,500	\$7,344	\$8,178	\$8,981

Terminal Value₁₀ = 9,206 / (.0676 - .025) = 216,262

Term Yr
 12,275
 3,069
 9,206

Cost of Capital (WACC) = 8.52% (0.60) + 2.40%(0.40) = 7.16%

Cost of capital declines gradually to 6.76%

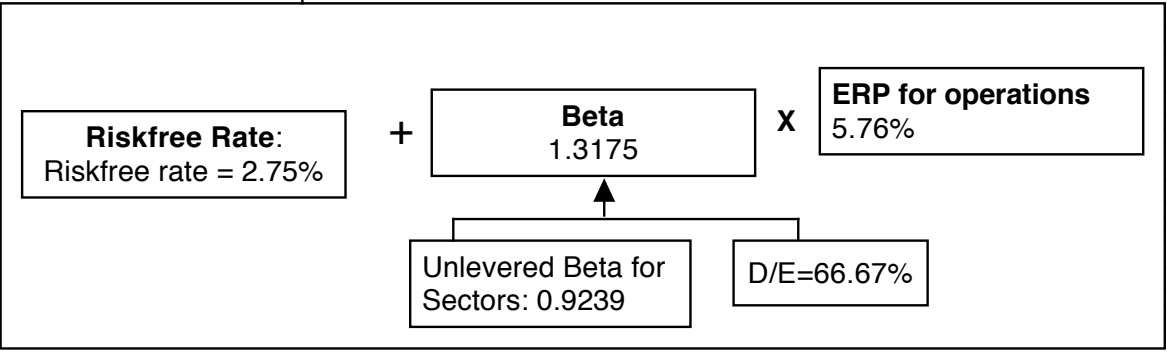
Cost of Equity
10.34%

Cost of Debt
 (2.75%+1.00%)(1-.361)
 = 2.40%
 Based on synthetic A rating

Weights
 E = 60% D = 40%

In November 2013, Disney was trading at \$67.71/share

Move to optimal debt ratio, with higher beta.



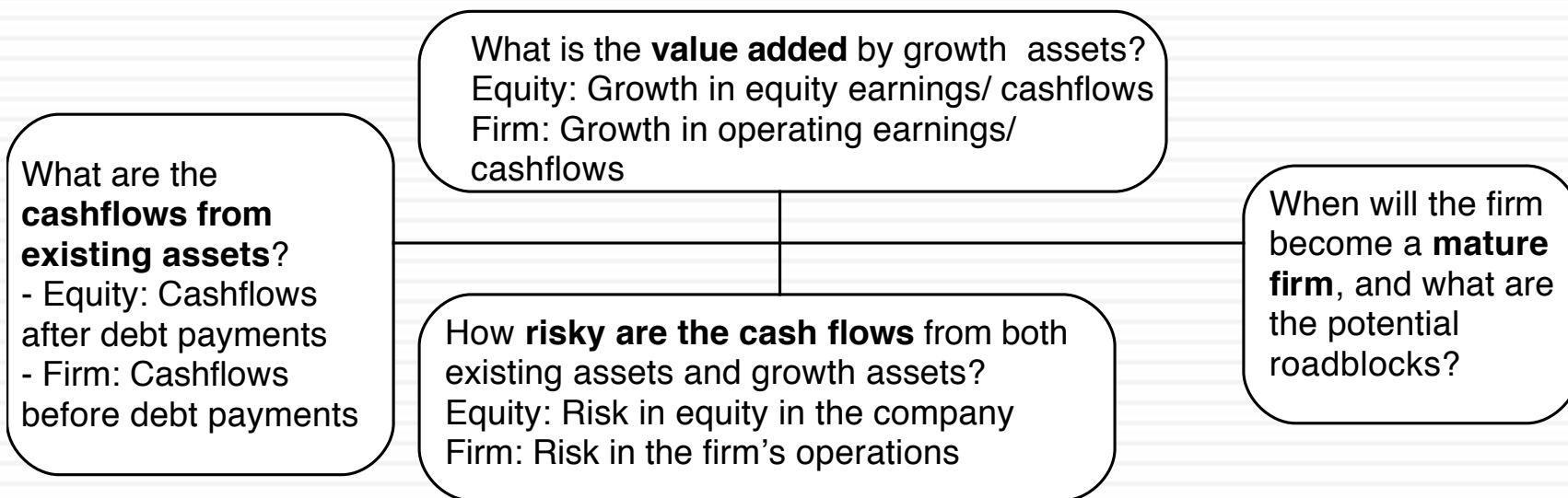
Aswath Damodaran



THE DARK SIDE OF VALUATION: VALUING DIFFICULT-TO-VALUE COMPANIES



The fundamental determinants of value...



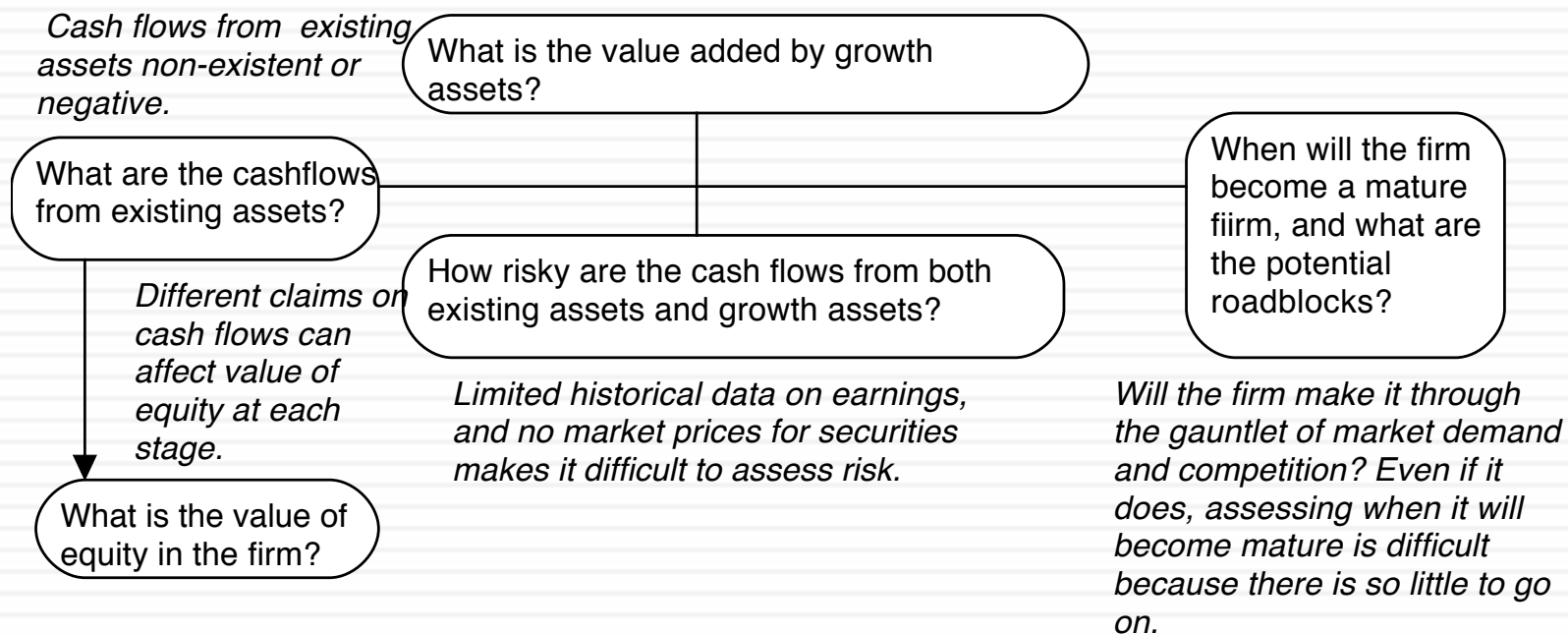
The Dark Side of Valuation...

- Valuing stable, money making companies with consistent and clear accounting statements, a long and stable history and lots of comparable firms is easy to do.
- The true test of your valuation skills is when you have to value “difficult” companies. In particular, the challenges are greatest when valuing:
 - Young companies, early in the life cycle, in young businesses
 - Companies that don’t fit the accounting mold
 - Companies that face substantial truncation risk (default or nationalization risk)

I. The challenge with young companies...

Figure 5.2: Estimation Issues - Young and Start-up Companies

Making judgments on revenues/ profits difficult because you cannot draw on history. If you have no product/ service, it is difficult to gauge market potential or profitability. The company's entire value lies in future growth but you have little to base your estimate on.



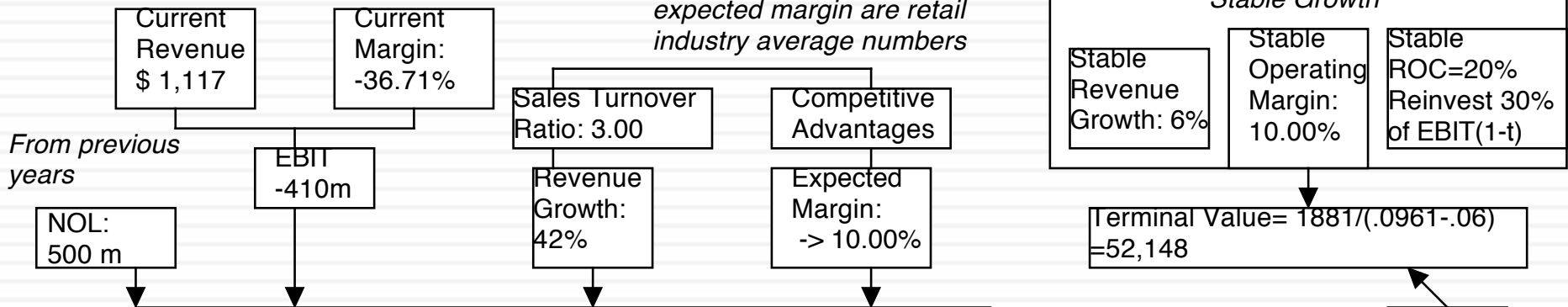
Upping the ante.. Young companies in young businesses...

- When valuing a business, we generally draw on three sources of information
 - ▣ The firm's current financial statement
 - How much did the firm sell?
 - How much did it earn?
 - ▣ The firm's financial history, usually summarized in its financial statements.
 - How fast have the firm's revenues and earnings grown over time?
 - What can we learn about cost structure and profitability from these trends?
 - Susceptibility to macro-economic factors (recessions and cyclical firms)
 - ▣ The industry and comparable firm data
 - What happens to firms as they mature? (Margins.. Revenue growth... Reinvestment needs... Risk)
- It is when valuing these companies that you find yourself tempted by the dark side, where
 - ▣ "Paradigm shifts" happen...
 - ▣ New metrics are invented ...
 - ▣ The story dominates and the numbers lag...

Amazon in January 2000

Sales to capital ratio and expected margin are retail industry average numbers

Stable Growth

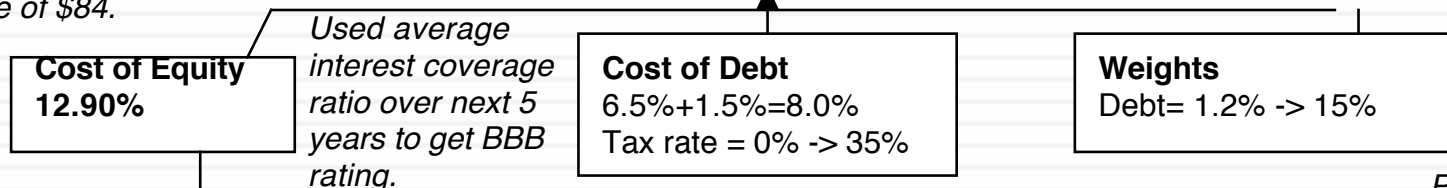


Value of Op Assets \$ 15,170
 + Cash \$ 26
 = Value of Firm \$15,196
 - Value of Debt \$ 349
 = Value of Equity \$14,847
 - Equity Options \$ 2,892
 Value per share \$ 35.08

	150.00%	100.00%	75.00%	50.00%	30.00%	25.20%	20.40%	15.60%	10.80%	6.00%	Term. Year
Revenues	\$ 2,793	\$ 5,585	\$ 9,774	\$ 14,661	\$ 19,059	\$ 23,862	\$ 28,729	\$ 33,211	\$ 36,798	\$ 39,006	\$ 41,346
Operating Margin	-13.35%	-1.68%	4.16%	7.08%	8.54%	9.27%	9.64%	9.82%	9.91%	9.95%	10.00%
EBIT	-\$373	-\$94	\$407	\$1,038	\$1,628	\$2,212	\$2,768	\$3,261	\$3,646	\$3,883	\$4,135
EBIT(1-t)	-\$373	-\$94	\$407	\$871	\$1,058	\$1,438	\$1,799	\$2,119	\$2,370	\$2,524	\$2,688
- Reinvestment	\$600	\$967	\$1,420	\$1,663	\$1,543	\$1,688	\$1,721	\$1,619	\$1,363	\$961	\$155
FCFF	-\$931	-\$1,024	-\$989	-\$758	-\$408	-\$163	\$177	\$625	\$1,174	\$1,788	\$1,881

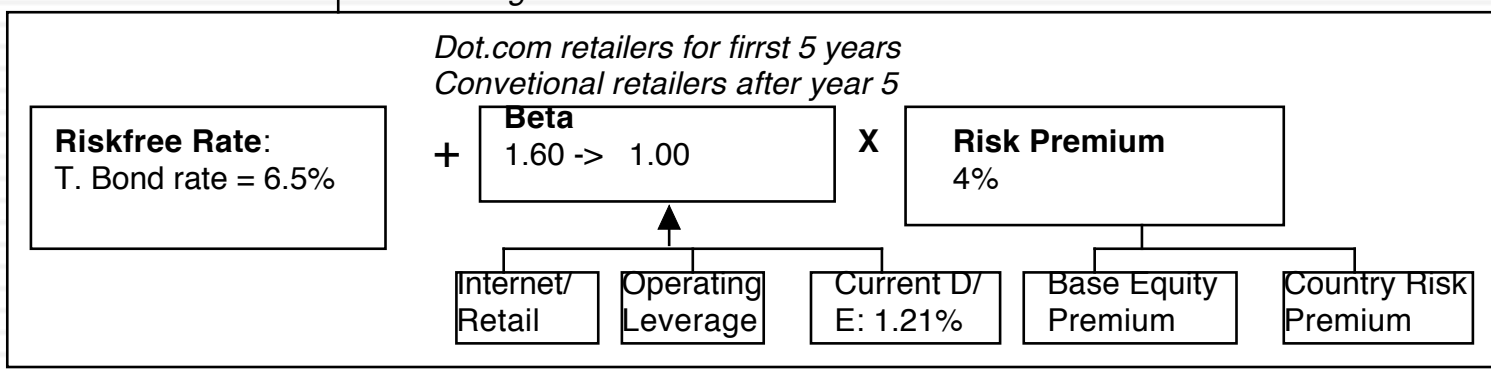
All existing options valued as options, using current stock price of \$84.

	1	2	3	4	5	6	7	8	9	10	Forever
Cost of Equity	12.90%	12.90%	12.90%	12.90%	12.90%	12.42%	11.94%	11.46%	10.98%	10.50%	
Cost of Debt	8.00%	8.00%	8.00%	8.00%	8.00%	7.80%	7.75%	7.67%	7.50%	7.00%	
After-tax cost of debt	8.00%	8.00%	8.00%	6.71%	5.20%	5.07%	5.04%	4.98%	4.88%	4.55%	
Cost of Capital	12.84%	12.84%	12.84%	12.83%	12.81%	12.13%	11.62%	11.08%	10.49%	9.61%	

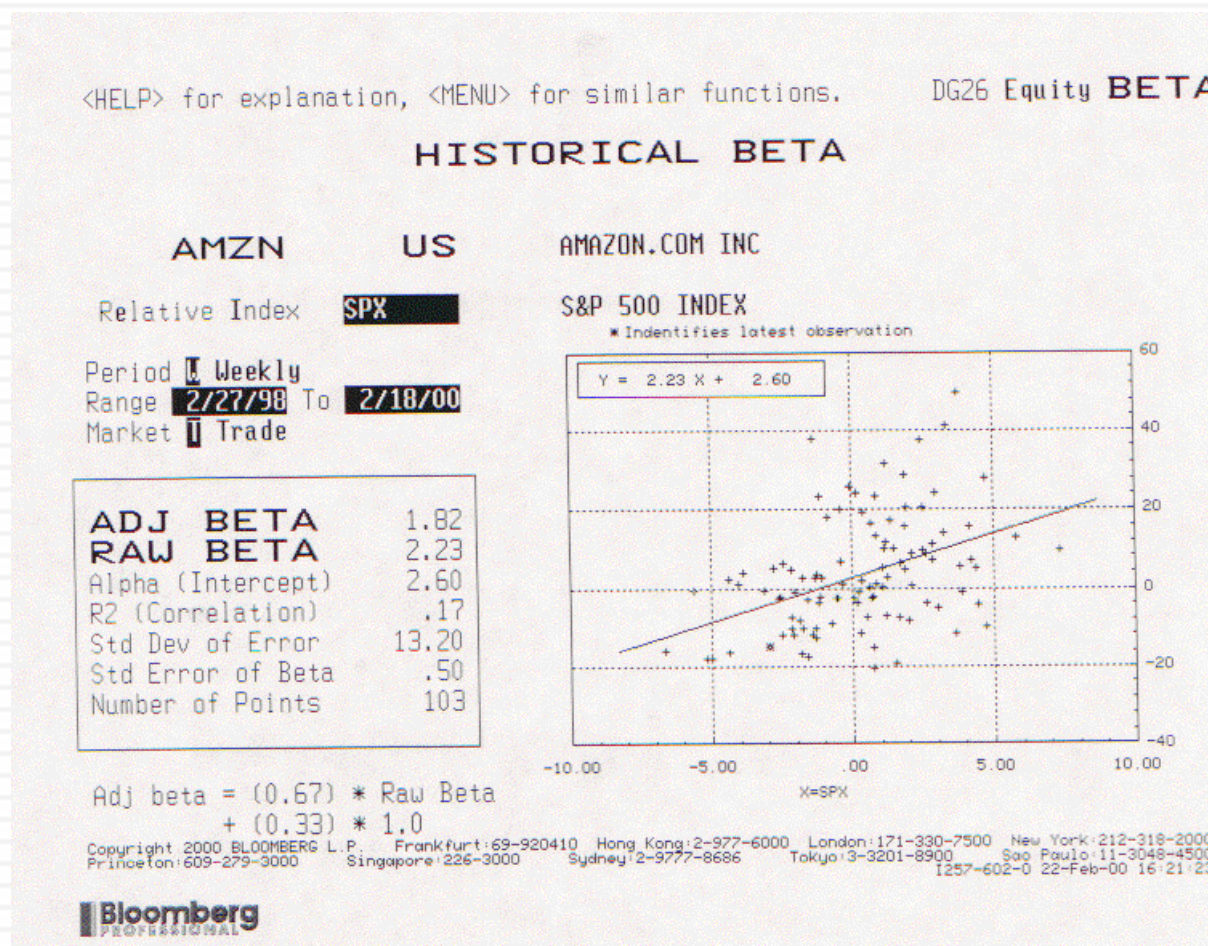


Amazon was trading at \$84 in January 2000.

Pushed debt ratio to retail industry average of 15%.



Lesson 1: Don't trust regression betas....

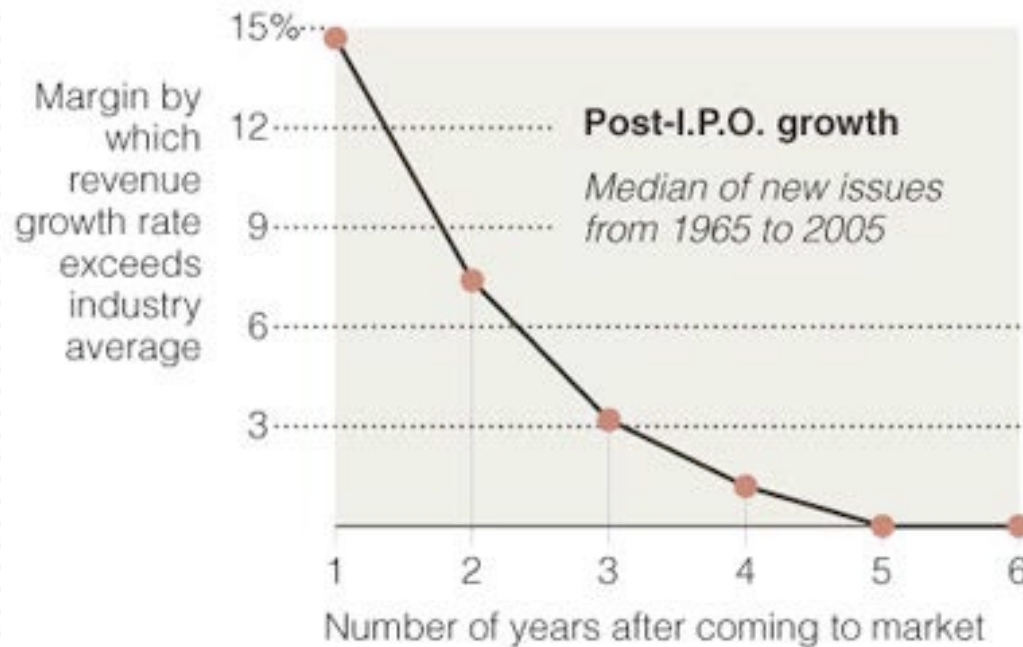


Lesson 2: Work backwards and keep it simple...

Year	Revenue Growth	Sales	Operating Margin	EBIT	EBIT (1-t)
Tr 12 mths		\$1,117	-36.71%	-\$410	-\$410
1	150.00%	\$2,793	-13.35%	-\$373	-\$373
2	100.00%	\$5,585	-1.68%	-\$94	-\$94
3	75.00%	\$9,774	4.16%	\$407	\$407
4	50.00%	\$14,661	7.08%	\$1,038	\$871
5	30.00%	\$19,059	8.54%	\$1,628	\$1,058
6	25.20%	\$23,862	9.27%	\$2,212	\$1,438
7	20.40%	\$28,729	9.64%	\$2,768	\$1,799
8	15.60%	\$33,211	9.82%	\$3,261	\$2,119
9	10.80%	\$36,798	9.91%	\$3,646	\$2,370
10	6.00%	\$39,006	9.95%	\$3,883	\$2,524
TY	6.00%	\$41,346	10.00%	\$4,135	\$2,688

Lesson 3: Scaling up is hard to do...

Typically, the revenue growth rate of a newly public company outpaces its industry average for only about five years.



Source: Andrew Metrick

The New York Times

Lesson 4: Don't forget to pay for growth...

Year	Revenues	Δ Revenue	Sales/Cap	Δ Investment	Invested Capital	EBIT (1-t)	Imputed ROC
Tr 12 mths	\$1,117				\$ 487	-\$410	
1	\$2,793	\$1,676	3.00	\$559	\$ 1,045	-\$373	-76.62%
2	\$5,585	\$2,793	3.00	\$931	\$ 1,976	-\$94	-8.96%
3	\$9,774	\$4,189	3.00	\$1,396	\$ 3,372	\$407	20.59%
4	\$14,661	\$4,887	3.00	\$1,629	\$ 5,001	\$871	25.82%
5	\$19,059	\$4,398	3.00	\$1,466	\$ 6,467	\$1,058	21.16%
6	\$23,862	\$4,803	3.00	\$1,601	\$ 8,068	\$1,438	22.23%
7	\$28,729	\$4,868	3.00	\$1,623	\$ 9,691	\$1,799	22.30%
8	\$33,211	\$4,482	3.00	\$1,494	\$ 11,185	\$2,119	21.87%
9	\$36,798	\$3,587	3.00	\$1,196	\$ 12,380	\$2,370	21.19%
10	\$39,006	\$2,208	3.00	\$736	\$ 13,116	\$2,524	20.39%
TY	\$41,346	\$2,340	NA		Assumed to be =		20.00%

Lesson 5: There are always scenarios where the market price can be justified...

		Target pre-tax Operating Margin				
		6%	8%	10%	12%	14%
Compounded annual Revenue Growth rate	30%	\$ (1.94)	\$ 2.95	\$ 7.84	\$ 12.71	\$ 17.57
	35%	\$ 1.41	\$ 8.37	\$ 15.33	\$ 22.27	\$ 29.21
	40%	\$ 6.10	\$ 15.93	\$ 25.74	\$ 35.54	\$ 45.34
	45%	\$ 12.59	\$ 26.34	\$ 40.05	\$ 53.77	\$ 67.48
	50%	\$ 21.47	\$ 40.50	\$ 59.52	\$ 78.53	\$ 97.54
	55%	\$ 33.47	\$ 59.60	\$ 85.72	\$ 111.84	\$ 137.95
	60%	\$ 49.53	\$ 85.10	\$ 120.66	\$ 156.22	\$ 191.77

Lesson 6: Don't forget to mop up...

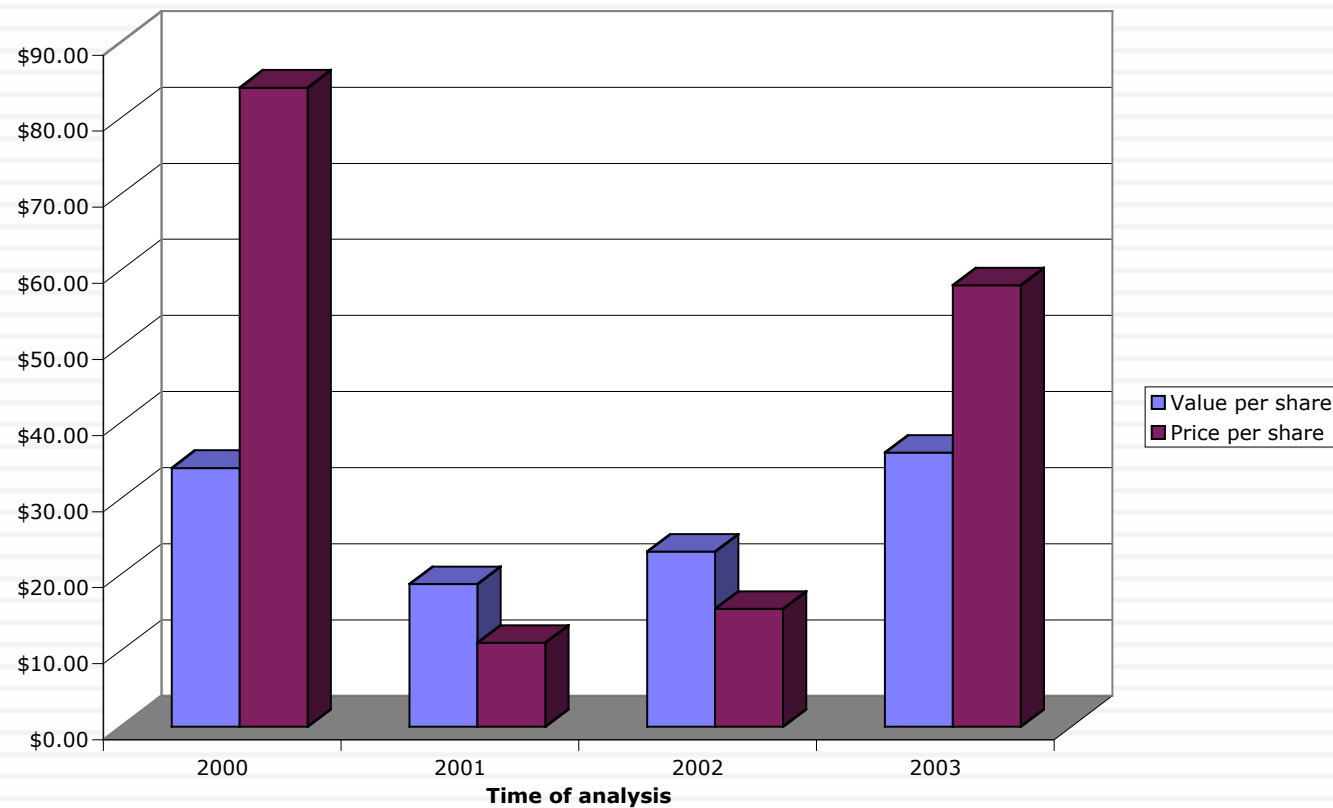
- Watch out for “other” equity claims: If you buy equity in a young, growth company, watch out for other (often hidden) claims on the equity that don't take the form of common shares. In particular, watch for options granted to managers, employees, venture capitalists and others (you will be surprised...).
 - ▣ Value these options as options (not at exercise value)
 - ▣ Take into consideration expectations of future option grants when computing expected future earnings/cash flows.
- Not all shares are equal: If there are differences in cash flow claims (dividends or liquidation) or voting rights across shares, value these differences.
 - ▣ Voting rights matter even at well run companies

Lesson 7: You will be wrong 100% of the time... and it really is not (always) your fault...

- No matter how careful you are in getting your inputs and how well structured your model is, your estimate of value will change both as new information comes out about the company, the business and the economy.
- As information comes out, you will have to adjust and adapt your model to reflect the information. Rather than be defensive about the resulting changes in value, recognize that this is the essence of risk.
- A test: If your valuations are unbiased, you should find yourself increasing estimated values as often as you are decreasing values. In other words, there should be equal doses of good and bad news affecting valuations (at least over time).

And the market is often “more wrong”

Amazon: Value and Price



Yandex: Valuation on May 24, 2014 (in Rubles)

	Last 12 months	2012
Revenues	42,388 RUB	29,767 RUB
Operating income or EBIT	13,102 RUB	9,454 RUB
Operating Margin	30.91%	31.76%
Revenue growth	42.40%	
Sales/Capital	2.55	

Revenue growth of **25%** a year for 5 years, tapering down to 6.37% in year 10

Pre-tax operating margin stays stable at 30% over time, with tax rate at 20%

Sales to capital ratio maintained at 2.50 (current level is 2.55)

Stable Growth
 $g = 6.37\%$
 Cost of capital = 12%
 $ROC = 15\%$;
 Reinvestment Rate = $6.37\%/15\% = 42.47\%$

Terminal Value₁₀ = $36,103 / (.12 - 0.0637) = 641,260$

	1	2	3	4	5	6	7	8	9	10
Revenue growth rate	25.00%	25.00%	25.00%	25.00%	25.00%	21.27%	17.55%	13.82%	10.10%	6.37%
Revenues	52,985RUB	66,231RUB	82,789RUB	103,486RUB	129,358RUB	156,878RUB	184,406RUB	209,895RUB	231,086RUB	245,806RUB
EBIT (Operating margin)	30.50%	30.44%	30.39%	30.33%	30.28%	30.22%	30.17%	30.11%	30.06%	30.00%
EBIT (Operating income)	\$16,160	\$20,163	\$25,158	\$31,390	\$39,166	\$47,411	\$55,629	\$63,201	\$69,454	\$73,742
Tax rate	24.68%	24.68%	24.68%	24.68%	24.68%	23.74%	22.81%	21.87%	20.94%	20.00%
EBIT(1-t)	12,172RUB	15,187RUB	18,949RUB	23,643RUB	29,500RUB	36,154RUB	42,941RUB	49,378RUB	54,913RUB	58,993RUB
- Reinvestment	4,239RUB	5,299RUB	6,623RUB	8,279RUB	10,349RUB	11,008RUB	11,012RUB	10,195RUB	8,476RUB	5,888RUB
FCFF	7,933RUB	9,888RUB	12,326RUB	15,364RUB	19,151RUB	25,146RUB	31,929RUB	39,182RUB	46,437RUB	53,105RUB

Operating assets 251,182
 + Cash 50,961
 - Debt 30,486
 Value of equity 271,657
 / # of shares 250.53
 Value per share 1084 Rubles

Term yr
 EBIT (1-t) 62,751
 - Reinv 26,648
 FCFF 36,103

Cost of capital = $17.55\% (.9208) + 7.74\% (.0792) = 16.77\%$

Cost of capital decreases to 12% from years 6-10

Cost of Equity
17.55%

Cost of Debt
 $(6.37\% + 2.45\% + 0.85\%) (1 - .2) = 7.74\%$

Weights
 $E = 92.08\%$ $D = 7.92\%$

Riskfree Rate:
Riskfree rate = 6.37%

Beta
1.2078
 +
 Unlevered Beta: 1.13 (Advertising)

D/E = 8.60%

ERP
9.26%

Region	Revenues	% of revenues	ERP
Russia	36.8	93.16%	8.80%
Ukraine & Belarus	2.7	6.84%	15.50%
Yandex	39.5	100.00%	9.26%

At the time of the valuation, Yandex was trading at \$32.73 per share. Converted at the prevailing exchange rate of 34.59 Rubles/\$, the price was 1,132 Rubles/share.

II. Dealing with decline and distress...

Historical data often reflects flat or declining revenues and falling margins. Investments often earn less than the cost of capital.

Growth can be negative, as firm sheds assets and shrinks. As less profitable assets are shed, the firm's remaining assets may improve in quality.

What is the value added by growth assets?

What are the cashflows from existing assets?

Underfunded pension obligations and litigation claims can lower value of equity. Liquidation preferences can affect value of equity

What is the value of equity in the firm?

How risky are the cash flows from both existing assets and growth assets?

Depending upon the risk of the assets being divested and the use of the proceeds from the divestiture (to pay dividends or retire debt), the risk in both the firm and its equity can change.

When will the firm become a mature firm, and what are the potential roadblocks?

There is a real chance, especially with high financial leverage, that the firm will not make it. If it is expected to survive as a going concern, it will be as a much smaller entity.

Dealing with the “downside” of Distress

- A DCF valuation values a firm as a going concern. If there is a significant likelihood of the firm failing before it reaches stable growth and if the assets will then be sold for a value less than the present value of the expected cashflows (a distress sale value), DCF valuations will understate the value of the firm.
- Value of Equity= DCF value of equity (1 - Probability of distress) + Distress sale value of equity (Probability of distress)
- There are three ways in which we can estimate the probability of distress:
 - Use the bond rating to estimate the cumulative probability of distress over 10 years
 - Estimate the probability of distress with a probit
 - Estimate the probability of distress by looking at market value of bonds..
- The distress sale value of equity is usually best estimated as a percent of book value (and this value will be lower if the economy is doing badly and there are other firms in the same business also in distress).

Current Revenue
\$ 4,390

Current Margin:
4.76%

EBIT
\$ 209m

Reinvestment:
Capital expenditures include cost of new casinos and working capital

Extended reinvestment break, due to investment in past

Industry average

Expected Margin:
-> 17%

Stable Growth

Stable Revenue Growth: 3%

Stable Operating Margin: 17%

Stable ROC=10%
Reinvest 30% of EBIT(1-t)

Terminal Value = $758 \cdot (0.0743 - 0.03)$
= \$ 17,129

Value of Op Assets \$ 9,793
+ Cash & Non-op \$ 3,040
= Value of Firm \$ 12,833
- Value of Debt \$ 7,565
= Value of Equity \$ 5,268

Value per share \$ 8.12

		1	2	3	4	5	6	7	8	9	10	Term. Year
Revenues	\$4,434	\$4,523	\$5,427	\$6,513	\$7,815	\$8,206	\$8,616	\$9,047	\$9,499	\$9,974	\$10,273	\$10,273
Oper margin	5.81%	6.86%	7.90%	8.95%	10%	11.40%	12.80%	14.20%	15.60%	17%	17%	17%
EBIT	\$258	\$310	\$429	\$583	\$782	\$935	\$1,103	\$1,285	\$1,482	\$1,696	\$1,746	\$1,746
Tax rate	26.0%	26.0%	26.0%	26.0%	26.0%	28.4%	30.8%	33.2%	35.6%	38.00%	38%	38%
EBIT * (1 - t)	\$191	\$229	\$317	\$431	\$578	\$670	\$763	\$858	\$954	\$1,051	\$1,083	\$1,083
- Reinvestment	-\$19	-\$11	\$0	\$22	\$58	\$67	\$153	\$215	\$286	\$350	\$325	\$325
FCFF	\$210	\$241	\$317	\$410	\$520	\$603	\$611	\$644	\$668	\$701	\$758	\$758
Beta	3.14	3.14	3.14	3.14	3.14	2.75	2.36	1.97	1.59	1.20		
Cost of equity	21.82%	21.82%	21.82%	21.82%	21.82%	19.50%	17.17%	14.85%	12.52%	10.20%		
Cost of debt	9%	9%	9%	9%	9%	8.70%	8.40%	8.10%	7.80%	7.50%		
Debt/ratio	73.50%	73.50%	73.50%	73.50%	73.50%	68.80%	64.10%	59.40%	54.70%	50.00%		
Cost of capital	9.88%	9.88%	9.88%	9.88%	9.88%	9.79%	9.50%	9.01%	8.32%	7.43%		

Term. Year
\$10,273
17%
\$ 1,746
38%
\$1,083
\$ 325
\$758

Forever

Cost of Equity
21.82%

Cost of Debt
3%+6%= 9%
9% (1-.38)=5.58%

Weights
Debt= 73.5% ->50%

Riskfree Rate:
T. Bond rate = 3%

+

Beta
3.14-> 1.20

X

Risk Premium
6%

Aswath Damodaran

Casino
1.15

Current
D/E: 277%

Base Equity
Premium

Country Risk
Premium

Las Vegas Sands
February 2009
Trading @ \$4.25

Adjusting the value of LVS for distress..

- In February 2009, LVS was rated B+ by S&P. Historically, 28.25% of B+ rated bonds default within 10 years. LVS has a 6.375% bond, maturing in February 2015 (7 years), trading at \$529. If we discount the expected cash flows on the bond at the riskfree rate, we can back out the probability of distress from the bond price:

$$529 = \sum_{t=1}^{t=7} \frac{63.75(1 - \pi_{\text{Distress}})^t}{(1.03)^t} + \frac{1000(1 - \pi_{\text{Distress}})^7}{(1.03)^7}$$

- Solving for the probability of bankruptcy, we get:
- π_{Distress} = Annual probability of default = 13.54%
 - ▣ Cumulative probability of surviving 10 years = $(1 - .1354)^{10} = 23.34\%$
 - ▣ Cumulative probability of distress over 10 years = $1 - .2334 = .7666$ or 76.66%
- If LVS is becomes distressed:
 - ▣ Expected distress sale proceeds = \$2,769 million < Face value of debt
 - ▣ Expected equity value/share = \$0.00
- Expected value per share = $\$8.12 (1 - .7666) + \$0.00 (.7666) = \$1.92$

III. Valuing Financial Service Companies

Existing assets are usually financial assets or loans, often marked to market. Earnings do not provide much information on underlying risk.

Defining capital expenditures and working capital is a challenge. Growth can be strongly influenced by regulatory limits and constraints. Both the amount of new investments and the returns on these investments can change with regulatory changes.

What is the value added by growth assets?

What are the cashflows from existing assets?

When will the firm become a mature firm, and what are the potential roadblocks?

Preferred stock is a significant source of capital.

How risky are the cash flows from both existing assets and growth assets?

What is the value of equity in the firm?

For financial service firms, debt is raw material rather than a source of capital. It is not only tough to define but if defined broadly can result in high financial leverage, magnifying the impact of small operating risk changes on equity risk.

In addition to all the normal constraints, financial service firms also have to worry about maintaining capital ratios that are acceptable to regulators. If they do not, they can be taken over and shut down.

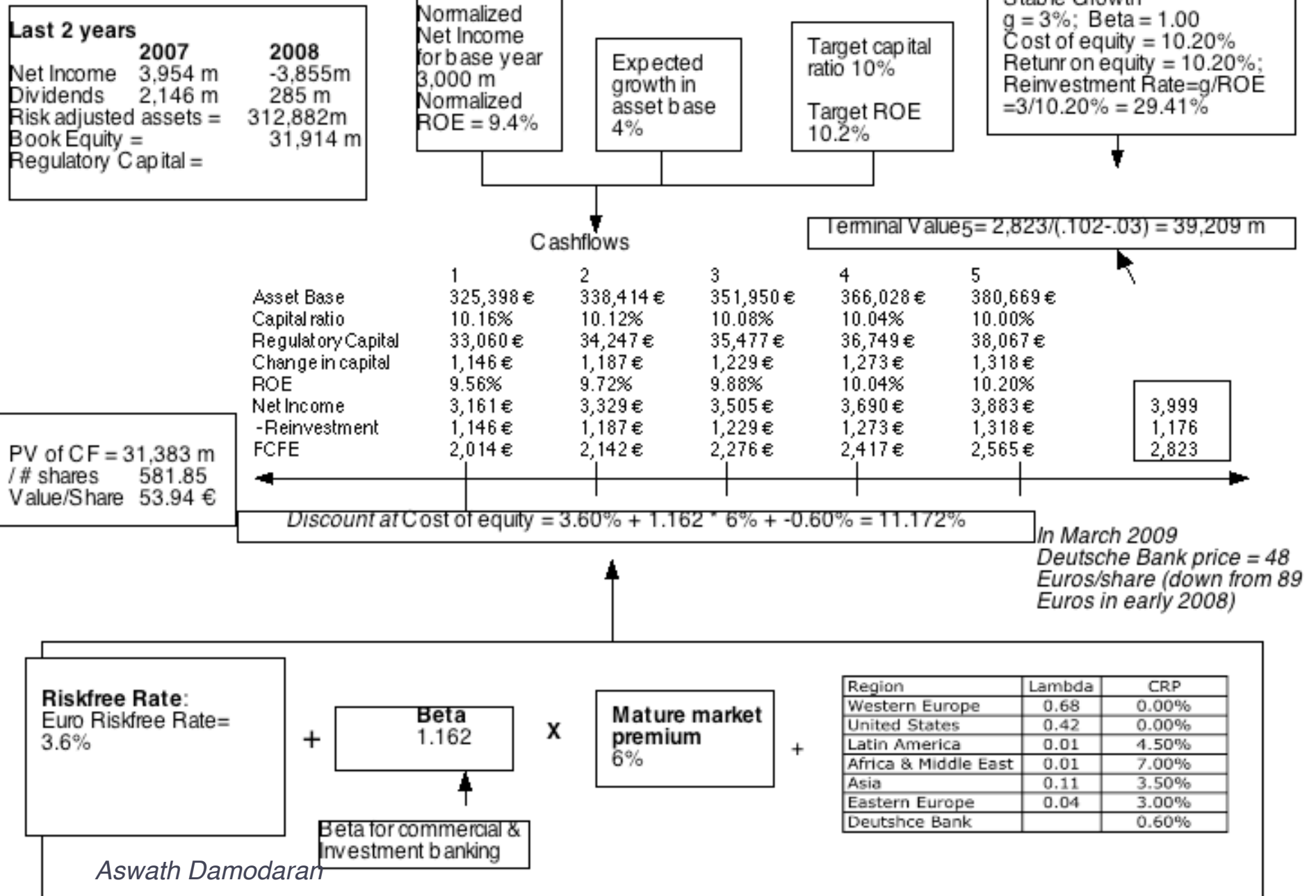
Lesson 1: Financial service companies are opaque...

- With financial service firms, we enter into a Faustian bargain. They tell us very little about the quality of their assets (loans, for a bank, for instance are not broken down by default risk status) but we accept that in return for assets being marked to market (by accountants who presumably have access to the information that we don't have).
- In addition, estimating cash flows for a financial service firm is difficult to do. So, we trust financial service firms to pay out their cash flows as dividends. Hence, the use of the dividend discount model.

Lesson 2: For financial service companies, book value matters...

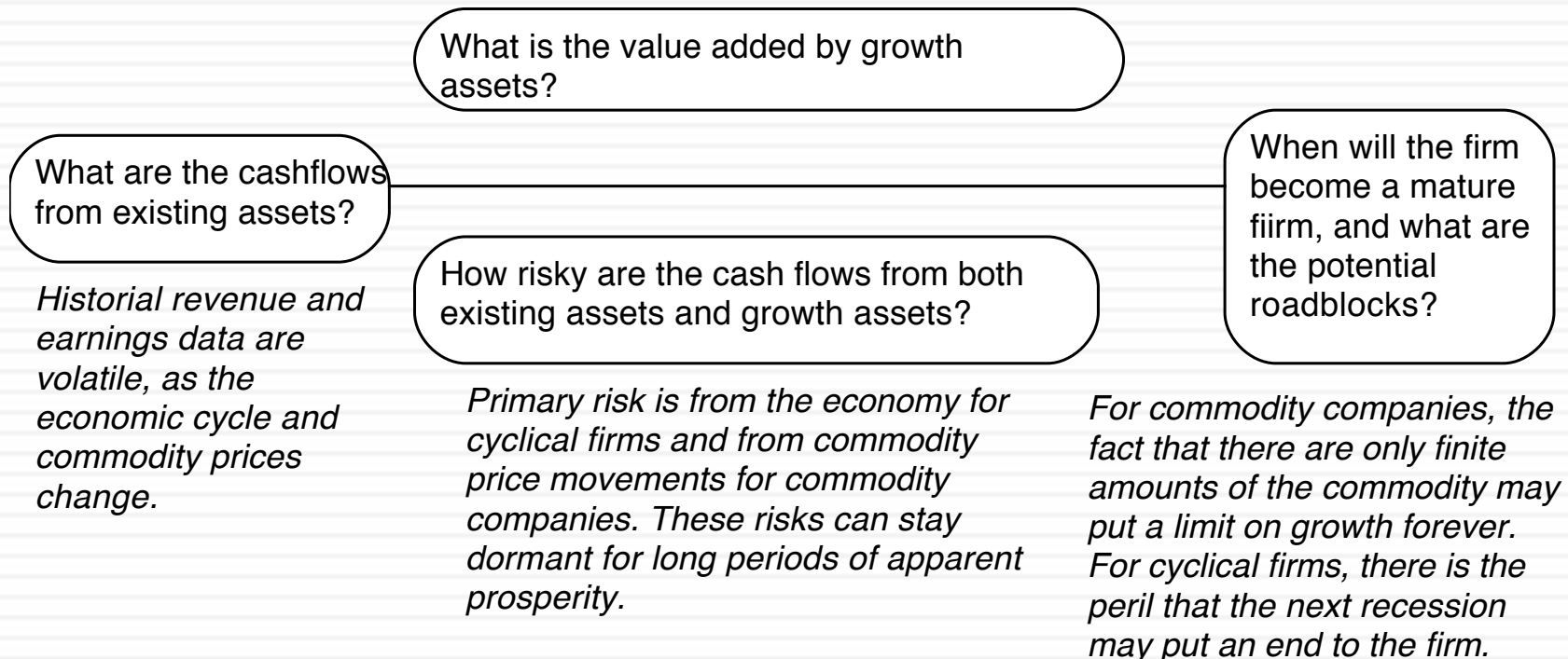
- The book value of assets and equity is mostly irrelevant when valuing non-financial service companies. After all, the book value of equity is a historical figure and can be nonsensical. (The book value of equity can be negative and is so for more than a 1000 publicly traded US companies)
- With financial service firms, book value of equity is relevant for two reasons:
 - Since financial service firms mark to market, the book value is more likely to reflect what the firms own right now (rather than a historical value)
 - The regulatory capital ratios are based on book equity. Thus, a bank with negative or even low book equity will be shut down by the regulators.
- From a valuation perspective, it therefore makes sense to pay heed to book value. In fact, you can argue that reinvestment for a bank is the amount that it needs to add to book equity to sustain its growth ambitions and safety requirements:
 - $FCFE = \text{Net Income} - \text{Reinvestment in regulatory capital (book equity)}$

2d. Deutsche Bank: March 2009



IV. Valuing cyclical and commodity companies

Company growth often comes from movements in the economic cycle, for cyclical firms, or commodity prices, for commodity companies.



Valuing a Cyclical Company - Toyota in Early 2009

Year	Revenues	Operating Incol	EBITDA	Operating Marg
FY1 1992	¥10,163,380	¥218,511	¥218,511	2.15%
FY1 1993	¥10,210,750	¥181,897	¥181,897	1.78%
FY1 1994	¥9,362,732	¥136,226	¥136,226	1.45%
FY1 1995	¥8,120,975	¥255,719	¥255,719	3.15%
FY1 1996	¥10,718,740	¥348,069	¥348,069	3.25%
FY1 1997	¥12,243,830	¥665,110	¥665,110	5.43%
FY1 1998	¥11,678,400	¥779,800	¥1,382,950	6.68%
FY1 1999	¥12,749,010	¥774,947	¥1,415,997	6.08%
FY1 2000	¥12,879,560	¥775,982	¥1,430,982	6.02%
FY1 2001	¥13,424,420	¥870,131	¥1,542,631	6.48%
FY1 2002	¥15,106,300	¥1,123,475	¥1,822,975	7.44%
FY1 2003	¥16,054,290	¥1,363,680	¥2,101,780	8.49%
FY1 2004	¥17,294,760	¥1,666,894	¥2,454,994	9.64%
FY1 2005	¥18,551,530	¥1,672,187	¥2,447,987	9.01%
FY1 2006	¥21,036,910	¥1,878,342	¥2,769,742	8.93%
FY1 2007	¥23,948,090	¥2,238,683	¥3,185,683	9.35%
FY1 2008	¥26,289,240	¥2,270,375	¥3,312,775	8.64%
FY 2009 (Estin	¥22,661,325	¥267,904	¥1,310,304	1.18%
		¥1,306,867		7.33%

In early 2009, Toyota Motors had the highest market share in the sector. However, the global economic recession in 2008-09 had pulled earnings down.

Normalized Return on capital and Reinvestment ②

Once earnings bounce back to normal, we assume that Toyota will be able to earn a return on capital equal to its cost of capital (5.09%). This is a sector, where earning excess returns has proved to be difficult even for the best of firms.

To sustain a 1.5% growth rate, the reinvestment rate has to be:
 Reinvestment rate = $1.5\% / 5.09\%$
 = 29.46%

Normalized Earnings ①

As a cyclical company, Toyota's earnings have been volatile and 2009 earnings reflect the troubled global economy. We will assume that when economic growth returns, the operating margin for Toyota will revert back to the historical average.

Normalized Operating Income = Revenues in 2009 * Average Operating Margin (98--09)
 = $22661 * .0733 = 1660.7$ billion yen

Operating Assets	19,640
+ Cash	2,288
+ Non-operating assets	6,845
- Debt	11,862
- Minority Interests	583
Value of Equity	
/ No of shares	/3,448
Value per share	¥4735

$$\text{Value of operating assets} = \frac{1660.7 (1.015) (1 - .407) (1 - .2946)}{(.0509 - .015)} = 19,640 \text{ billion}$$

Normalized Cost of capital ③

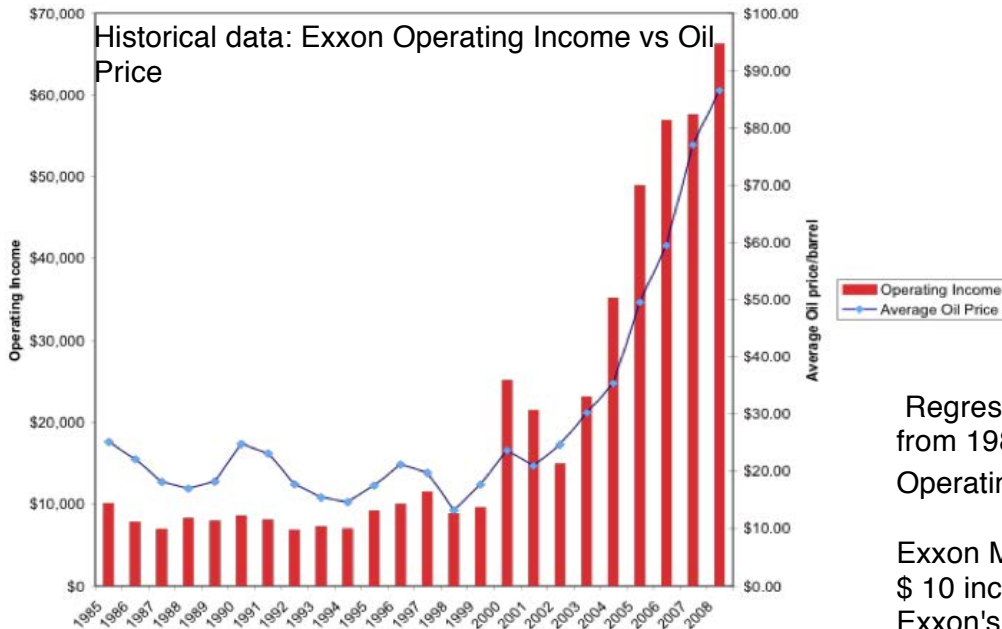
The cost of capital is computed using the average beta of automobile companies (1.10), and Toyota's cost of debt (3.25%) and debt ratio (52.9% debt ratio). We use the Japanese marginal tax rate of 40.7% for computing both the after-tax cost of debt and the after-tax operating income

Assuming a beta of 1.10
 $1.10 * 3.25\% (1 - .407) + 3.25\% (1 - .407) (.529) = 5.09\%$

Stable Growth ④

Once earnings are normalized, we assume that Toyota, as the largest market-share company, will be able to maintain only stable growth (1.5% in Yen terms)

Valuing a commodity company - Exxon in Early 2009



Regressing Exxon's operating income against the oil price per barrel from 1985-2008:

$$\text{Operating Income} = -6,395 + 911.32 (\text{Average Oil Price}) \quad R^2 = 90.2\%$$

(2.95) (14.59)

Exxon Mobil's operating income increases about \$9.11 billion for every \$ 10 increase in the price per barrel of oil and 90% of the variation in Exxon's earnings over time comes from movements in oil prices.

Estimate normalized income based on current oil price ①

At the time of the valuation, the oil price was \$ 45 a barrel. Exxon's operating income based on this price is

$$\text{Normalized Operating Income} = -6,395 + 911.32 (\$45) = \$34,614$$

Estimate return on capital and reinvestment rate based on normalized income ②

This operating income translates into a return on capital of approximately 21% and a reinvestment rate of 9.52%, based upon a 2% growth rate.

$$\text{Reinvestment Rate} = g / \text{ROC} = 2 / 21\% = 9.52\%$$

$$\text{Value of operating assets} = \frac{34,614(1 - .38)(1 - .0952)}{(.0818 - .02)} = \$320,472 \text{ million}$$

Exxon's cost of capital ④

Exxon has been a predominantly equity funded company, and is expected to remain so, with a debt ratio of only 2.85%. Its cost of equity is 8.35% (based on a beta of 0.90) and its pre-tax cost of debt is 3.75% (given AAA rating). The marginal tax rate is 38%.

$$\text{Cost of capital} = 8.35\% (0.9715) + 3.75\% (1 - .38) (.0285) = 8.18\%$$

Expected growth in operating income ③

Since Exxon Mobile is the largest oil company in the world, we will assume an expected growth of only 2% in perpetuity.

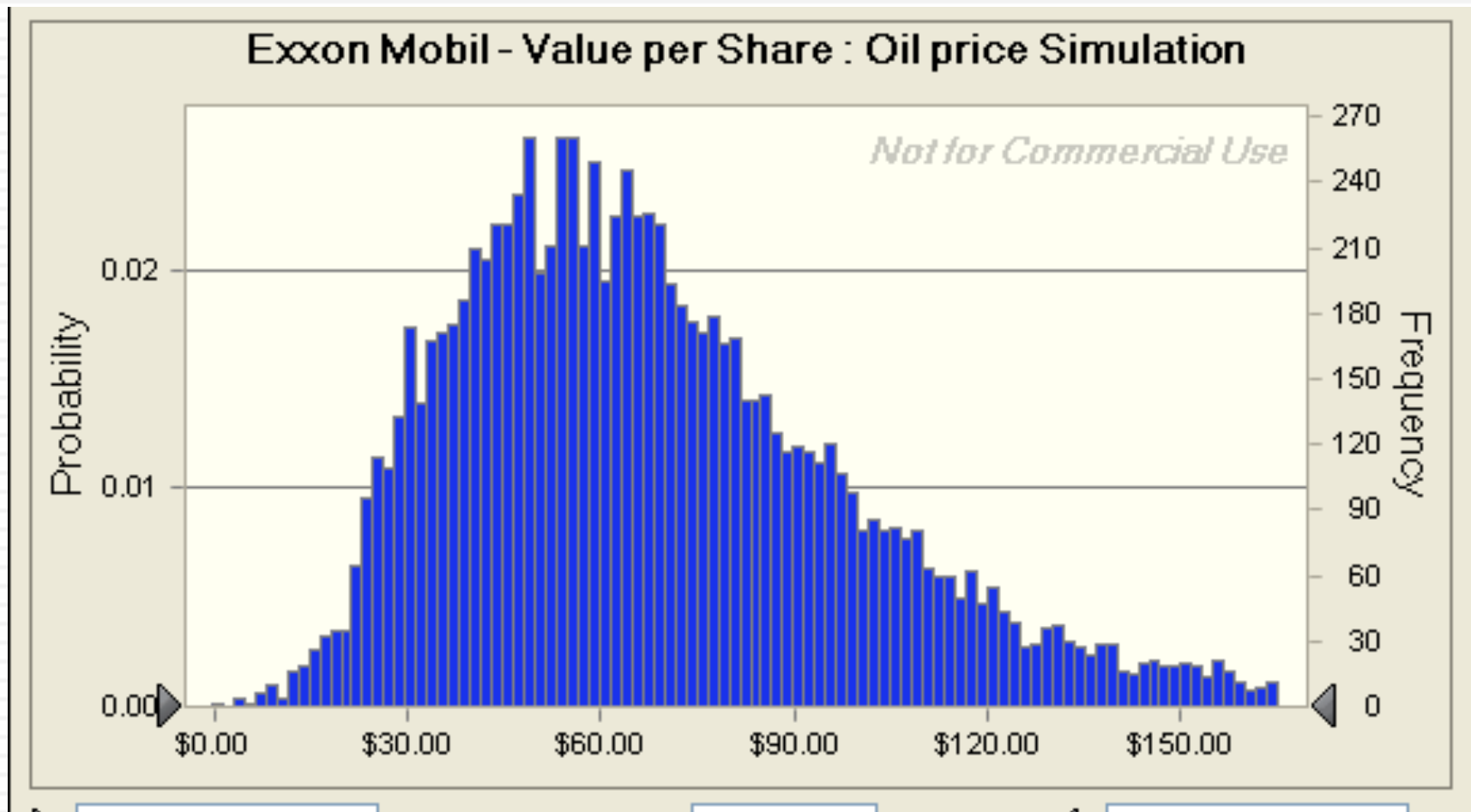
Lesson 1: With “macro” companies, it is easy to get lost in “macro” assumptions...

- With cyclical and commodity companies, it is undeniable that the value you arrive at will be affected by your views on the economy or the price of the commodity.
- Consequently, you will feel the urge to take a stand on these macro variables and build them into your valuation. Doing so, though, will create valuations that are jointly impacted by your views on macro variables and your views on the company, and it is difficult to separate the two.
- The best (though not easiest) thing to do is to separate your macro views from your micro views. Use current market based numbers for your valuation, but then provide a separate assessment of what you think about those market numbers.

Lesson 2: Use probabilistic tools to assess value as a function of macro variables...

- If there is a key macro variable affecting the value of your company that you are uncertain about (and who is not), why not quantify the uncertainty in a distribution (rather than a single price) and use that distribution in your valuation.
- That is exactly what you do in a Monte Carlo simulation, where you allow one or more variables to be distributions and compute a distribution of values for the company.
- With a simulation, you get not only everything you would get in a standard valuation (an estimated value for your company) but you will get additional output (on the variation in that value and the likelihood that your firm is under or over valued)

Exxon Mobil Valuation: Simulation



First Principles

